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DEPARTMENT OF ATTORNEY GENERAL



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January 20, 2021

Ms. Lisa Felice
Executive Secretary
Michigan Public Service Commission
7109 West Saginaw Highway
Lansing, MI 48917

Dear Ms. Felice:

Re: MPSC Case No. U-21087

Enclosed find the *Attorney General and Citizen's Utility Board of Michigan's Testimony and Exhibits of Richard Bunch*, and related Proof of Service.

Sincerely,

Joel B. King
Assistant Attorney General

cc: All Parties

PROOF OF SERVICE - U-21087

The undersigned certifies that a copy of the *Attorney General and Citizens Utility Board of Michigan's Testimony and Exhibits of Richard Bunch* was served upon the parties listed below by e-mailing the same to them at their respective e-mail addresses on the 20th day of January 2022.

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STATE OF MICHIGAN

MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of DTE)
Electric Company for the approval of a partial)
waiver of the Consumer Standards and Billing)
Practices for Electric Residential Service and) Case No. U-21087
approval of a Voluntary Prepay Billing)
Program.)

TESTIMONY OF RICHARD BUNCH

ON BEHALF OF

ATTORNEY GENERAL DANA NESSEL AND

CITIZENS UTILITY BOARD OF MICHIGAN

January 20, 2022

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1 **I. INTRODUCTION & QUALIFICATIONS**

2 **Q. Please state for the record your name, position, and business address.**

3 A. My name is Richard Bunch. I am a senior consultant of 5 Lakes Energy LLC, a Michigan
4 limited liability corporation, located at Suite 218, 220 MAC Avenue, East Lansing,
5 Michigan 48823. I am also Executive Director of Michigan Municipal Association for
6 Utility Issues, a non-profit organization located in Ann Arbor, Michigan.

7 **Q. On whose behalf is this testimony being offered?**

8 A. I am testifying on behalf of Attorney General Dana Nessel (“AG”) and the Citizens Utility
9 Board of Michigan (“CUB”).

10 **Q. Please summarize your experience in the field of utility regulation.**

11 A. I have worked since 2015 in positions related to clean energy, primarily on behalf of local
12 governments. A significant portion of that work has included analysis of MPSC rate and
13 other cases and supporting local government participation in rate cases and other MPSC
14 proceedings. From 2015 to 2017 I organized and led the Municipal Street Lighting
15 Coalition, a group of 24 municipalities served by DTE Energy, which intervened in Cases
16 U-17767 and U-18014 and participated in the subsequent MPSC-ordered street lighting
17 collaborative. I organized and supported intervention of several municipalities receiving
18 street lighting services from Consumers Energy in cases U-20134, U-20697 and U-20963.
19 I have also provided expert testimony on production cost allocation in DTE Electric rate
20 case U-20561 and on power supply cost reconciliation in Indiana-Michigan Power case U-
21 20530. I have submitted comments in several other case dockets on behalf of MI-MAUI

1 and have participated in various MI Power Grid working groups and the Electric
2 Distribution Planning working group. Most recently, I directed MI-MAUI's intervention
3 in DTE Energy's Voluntary Green Power case U-20713.

4 In the field of consumer protection, I am president and board chair of the Washington
5 Public Interest Group (WashPIRG), an independent, non-partisan, non-profit organization
6 based in Seattle that works to protect consumers and promote good government. I am also
7 an officer of the WashPIRG Foundation, an affiliated research and public education
8 organization. I was Executive Director of WashPIRG from 1989 to 1992 and worked on a
9 number of consumer protection issues during that time and in more junior positions prior
10 to that. I also served until 2020 as an officer of the PIRG in Michigan (PIRGIM) Education
11 Foundation, a non-partisan consumer protection and good government public education
12 and research organization based in Ann Arbor.

13 My work experience, educational, and professional development background are
14 summarized in my résumé, provided as Exhibit AGCUB-1.

15 **Q: Please describe your training and education relevant to the field of utility regulation.**

16 EUCI Outdoor Street Lighting Conference, June 2019

17 EUCI Electric Cost-of-Service - Essential Concepts for a Changing Industry, July 2019

18 MSU-IPU Accounting and Ratemaking course, September 2020

19 EUCI Utility Green Tariffs: A to Z course, November 2020

20 MSU-IPU Advanced Regulatory Accounting and Auditing course, October 2021

1 NRRI Regulatory Training Institute, Regulating Public Utility Performance course, current

2 **Q. Have you testified before this Commission or as an expert in any other proceeding?**

3 A. I have previously testified before the Michigan Public Service Commission
4 ("Commission") in the following cases:

- 5 • Case U-20963 (Consumers Energy Company Electric General Rate case)
- 6 • Case U-20697 (Consumers Energy Company Electric General Rate Case)
- 7 • Case U-20561 (DTE Electric Company Electric General Rate Case)
- 8 • Case U-20530 (I&M PSCR reconciliation case).

9 I have testified before the Kentucky Public Utilities Commission in rate cases 2020-349
10 and 2020-350, the combined Kentucky Utilities and Louisville Gas & Electric electric and
11 gas rate cases.

12 **Q. What is the purpose of your testimony?**

13 A. I am testifying on behalf of the Attorney General of Michigan and Citizens Utility Board
14 (CUB) of Michigan to address concerns with DTE Electric's application to offer an electric
15 prepay program.

16 **Q. Are you sponsoring any exhibits?**

17 A. Yes, I am sponsoring the following exhibits:

- 18 • Exhibit AGCUB Bunch1: Resume of Richard Bunch
- 19 • Exhibit AGCUB Bunch2: American Council for an Energy Efficient Economy
20 prepay feasibility study for Minnesota Dept of Commerce.

- 1 • Exhibit AGCUB Bunch3: U-21087 DTE First Discovery Responses to
2 AGCUB
- 3 • Exhibit AGCUB Bunch4: Prepay Energy Working Group customer survey
4 report
- 5 • Exhibit AGCUB Bunch5: DTE Prepay focus group summary
- 6 • Exhibit AGCUB Bunch6: Change in average electricity use of DTE residential
7 customers during prepay pilot
- 8 • Exhibit AGCUB Bunch7: Mummery-Reilly study of UK prepayment
9 programs
- 10 • Exhibit AGCUB Bunch8: DTE Pay As You Go 2015 Pilot Program Final
11 Report
- 12 • Exhibit AGCUB Bunch9: US Department of Energy prepay report
- 13 • Exhibit AGCUB Bunch10: Prepay Energy Working Group bad debt survey
- 14 • Exhibit AGCUB Bunch11: DTE Pay As You Go 2014 Pilot Program Annual
15 Report
- 16 • Exhibit AGCUB Bunch12: U-21087 DTE Third discovery responses to
17 AGCUB
- 18 • Exhibit AGCUB Bunch13: U-21087 DTE Second discovery responses to
19 AGCUB
- 20 • Exhibit AGCUB Bunch14: U-20629 MI Power Grid reliability comments
21 submitted by CUB.

1 **II. THE COMMISSION SHOULD NOT APPROVE DTE’S PREPAY PROPOSAL**

2 **Q. Do you recommend approval of the Prepay program as proposed by DTE Electric**
3 **(“the Company)?**

4 A. No. There are too many risks to customers. Financial, energy security, and energy use
5 benefits to customers are unclear. The Company has failed to demonstrate that the program
6 will be cost-effective.

7 **Q. Please outline your testimony.**

8 A. First, I will demonstrate that the Company overstates the likely benefits of Prepay in
9 various ways, simultaneously understating the costs and burdens it imposes on participants.

10 Second, I will explain why the prepay program customers want is not what the Company
11 is proposing.

12 Third, I will show that enrollment in Prepay would not be truly voluntary for some
13 customers, and that asking them to waive their rights under the Billing Practice Rules
14 would therefore be unfair.

15 Fourth, I will explain why waiving the billing rules as requested would be unwise given
16 the customers who would likely enroll and the costs and benefits to them.

17 Fifth, I point out that the Company has not demonstrated that its Prepay proposal will be
18 cost-effective, that there is good reason to think it will not be, and that the Company should
19 not be permitted to launch the program now and seek cost recovery later.

1 **III. THE COMPANY OVERSTATES THE BENEFITS OF PREPAY AND**
2 **UNDERSTATES THE COSTS AND BURDENS**

3 **Q. In what ways does the Company overstate the benefits of Prepay?**

4 **A.** The Company overstates the breadth of customer segments likely to enroll in the program.
5 Program design, benefits, costs, and rules should accurately reflect the interests, needs, and
6 capacities of the customers served.

7 The Company overstates the benefits of Prepay by suggesting that those benefits are unique
8 to Prepay. They are not, though the benefits may be amplified by the coercive threat of
9 short-notice shutoffs.

10 The Company overstates the customer segments likely to experience energy use reductions
11 and cost savings, as well as the amount and reliability of those reductions.

12 The Company also oversells the utility of energy use reductions by failing to distinguish
13 between, and quantify, true energy waste reductions versus self-deprivation behaviors that
14 reduce the quality of energy services customers receive.

15 **Q. How does the Company overstate the breadth of customer segments likely to enroll**
16 **in the program?**

17 **A.** The Company contends that its market research reveals interest among five customer
18 segments in various features or benefits of Prepay:

19 1. Young and Tech Savvy

- 1 2. Financially Stable Saver
- 2 3. Renters and College Students
- 3 4. Payment Challenged and Vulnerable
- 4 5. Moderate Income Suburban Couple¹

5 **Q. Is the Company's market segment research consistent with actual customer-segment**
6 **representation in existing prepay programs?**

7 **A.** No. Prepay programs for which customer segment data are available show that
8 participation skews strongly toward low-income customers. "Among programs that have
9 disclosed customers' income information, low-income consumers usually comprise the
10 largest group of enrolled customers in prepaid plans... In some regions, such as the
11 Netherlands, Ghana, and some areas of the United States, utilities market prepay to all
12 income levels, but low-income customers are nevertheless the primary participants."²

13 **Q: Can we expect DTE's Prepay program to serve a broader customer demographic**
14 **than other utilities' programs?**

15 **A.** The Company itself does not harbor this expectation: "...the company would expect that
16 the demographics who enroll in its prepay program will not differ significantly from that

¹ DTE witness Michael Hatsios, Direct Testimony, pp. 6-8.

² American Council for an Energy-Efficient Economy (ACEEE) and SeventhWave, "Examining Potential for Prepay as an Energy Efficiency Program in Minnesota," Minnesota Department of Commerce Division of Energy Resources, 12/1/2018, p. 15. Provided as Exhibit AGCUB-Bunch2.

1 of other prepay providers.”³

2 **Q. Why don’t customer market segments who express interest in pre-pay options match**
3 **actual enrollment?**

4 **A.** A closer look at what customers seek in a prepay program is revealing. Consumer surveys
5 performed by a prepay energy collaborative group in which the Company participates
6 found that, “The top benefits consumers would choose for a prepaid energy experience are
7 related to reducing costs, budgeting and help with averages/seasonal cost fluctuations.”⁴

8 For many customer segments, however, prepay is neither an effective nor straightforward
9 way to deliver many of those benefits. DTE’s own market research shows that customers
10 on auto-pay and budget-wise billing see little value in a prepay program – because they
11 already have effective ways to budget and even out seasonal fluctuations, without having
12 to pay the utility in advance and give up billing rights.⁵ Similarly, customers who are
13 seeking more insight into the energy usage can use DTE’s aptly named Insight app for that
14 purpose – again, without paying the utility early or giving up their billing rights.

15 **Q. What customer segments best match to Prepay features?**

16 **A.** The Company’s market research states, “Understanding the Prepay plan’s appeal requires
17 a nuanced understanding of the potential subscriber and their financial behavior. Within

³ Hatsios, response to discovery question U-21087 AGCUBDE-1.8bi. Included in Exhibit AGCUB-Bunch3.

⁴ Russell Research, “Prepay Energy: Case of Market Catching Up to Consumers,” Consumer Survey Report No. 38 conducted for Distributed Energy Financial Group, p. 6. Provided as attachment to response to discovery question U-21087 SDE-1.3-01. Included as Exhibit AGCUB-Bunch4.

⁵ Emicity, “DTE Prepay Program Study Final Report”, December 2020, p. 14. Provided as attachment to response to discovery question U-21087 SDE-1.12-01. Included as Exhibit AGCUB-Bunch5.

1 these discussions there were a set of customers who tend to truly live in the financial
2 moment. For these customers, income comes in and leaves almost immediately, with little
3 or no forward planning... Customers with this mindset likely have no reserves at all and
4 often seem incapable of setting money aside for even short periods of time in anticipation
5 of normal, recurring bills....”⁶

6 Among the customer segments targeted by the Company, only “Payment Troubled and
7 Vulnerable Customers” reasonably fits this description. In sum, while various customer
8 market segments might well comprise a minority of demand for prepay programs,
9 experience from other providers and the Company’s own market research strongly suggest
10 that the Company’s Prepay proposal would be of interest primarily to its low-income
11 customers.

12 **Q. Why is it important to accurately characterize the target market for Prepay?**

13 **A.** First, different market segments seek different benefits. It is important to design the
14 program to provide the benefits sought by a preponderance of participants.

15 Second, program costs and rules should also accurately reflect the needs of participants.

16 Among the Company’s targeted market segments, billing and shutoff protections are most
17 important to Payment Troubled and Vulnerable Customers. It is one thing to waive billing
18 rules for Young and Tech Savvy customers who are unlikely to face financial pressures
19 that might lead to power shutoff, are very comfortable with virtual billing, and who have
20 reliable access to electronic communications. It is quite another thing to waive billing rules

⁶ Emicity, p. 11

1 and shutoff protections for a customer segment that is financially insecure, less tech savvy,
2 and are more likely to lose access to phone and email communication than other segments.

3 Third, accurately characterizing appeal to various market segments helps to estimate the
4 size of the potential market, which helps to estimate total benefits generated and costs of
5 the program.

6 **Q. How does the Company overstate the benefits of Prepay by suggesting that those**
7 **benefits are unique to Prepay?**

8 **A.** The Company overstates the extent to which benefits are unique to Prepay, the incremental
9 contribution of Prepay to generating those benefits, and the reliability of those benefits.

10 **Q. What customer benefits does the Company attribute to Prepay?**

11 **A.** Witness Hatsios explains that Prepay will provide participants with:

- 12 1. Visibility into, and a greater sense of control over, their energy usage and how much
13 they spend.
- 14 2. The ability to pay on a schedule that they establish and that better meets their needs.
- 15 3. A simplified billing experience that eliminates the need for what some customers find
16 a complicated monthly bill.
- 17 4. Customers with past-due balances can apply a portion of each prepayment towards the

1 reduction of any past-due balance.⁷

2 **Q. What is your evaluation of the claim that Prepay will provide visibility into, and a**
3 **greater sense of control over, customers' energy usage and how much they spend?**

4 **A.** There are two claims to evaluate in this statement. First, does Prepay provide greater
5 visibility and control? Second, does that result in reduced energy usage and cost?

6 There is nothing necessarily unique about Prepay that gives customers greater visibility
7 and control over their energy use. The Company could just as easily send "push"
8 notifications to post-pay customers notifying them of their recent and projected energy use
9 and costs. The Company confirms that it could provide post-pay customers with daily
10 usage notifications and does so for customers who download and use the DTE Insight app.⁸

11 What is unique to Prepay is not the ability to provide visibility and control, but the
12 motivation to pay attention and act promptly lest a customer's account reach zero balance
13 and their power gets shut off.

14 **Q. Do prepay program customers use less energy and spend less money than they would**
15 **as post-pay customers?**

16 **A.** Evaluations of prepay programs offered around the world vary in their conclusions, but in
17 general conclude that many- but not all – prepay customers use less energy and save money.

18 We know that participants in the Company's Pay As You Go prepay pilot averaged 6%

⁷ Hatsios, Direct Testimony, pp. 5-6.

⁸ Hatsios, response to discovery question U-21087-AGCUBDE-1.2aiii2. Provided in Exhibit AGCUB-Bunch3.

1 weather-normalized reductions in energy use.⁹ These reductions varied substantially
2 across customer segments and over time, as I will detail below.

3 Those reductions, furthermore, can largely be attributed to various causes other than
4 Prepay, causes that are not necessarily unique to Prepay, and causes firmly attributable to
5 Prepay that may be problematic.

6 We should examine whether Prepay program features could be offered to customers
7 without requiring them to waive their rights under the billing rules and pay for their
8 electricity in advance. We should also examine whether the methods used to motivate
9 Prepay customers to use less energy are justified by the ends.

10 **Q. What factors independent of Prepay might cause a Prepay customer to reduce their**
11 **use of energy?**

12 **A.** Prepay customers may use less energy than they did as post-pay customers because of
13 changes in their personal financial circumstances, general economic conditions, rate
14 changes, and energy efficiency improvements, among other factors.

15 **Q. Have studies distinguished the impact of these independent variables on energy use**
16 **from that of the prepay programs?**

17 **A.** The Company's analysis of Pay As You Go energy use, and most published analyses of
18 other prepay programs, have not compared prepay customers to similarly situated post-pay
19 customers. In other words, they did not use a control group that controls for the influence

⁹ Hatsios Direct Testimony, p. 10:10-12.

1 of other variables that affect both the control and study groups.

2 Tellingly, analyses of other prepay programs that did use control groups attributed smaller
3 reductions to prepay than studies that did not use control groups.¹⁰

4 The Company's analysis of changes in energy use in its Pay As You Go pilot was
5 longitudinal – it compared participants' energy use before they enrolled in the program to
6 the two years they were in the program. The Company also normalized for differences in
7 weather across the study period. A control-group study would have better isolated the
8 impact of the “treatment” (Pay As You Go) by comparing participants to a control group
9 of customers who did not receive the treatment (e.g., remained in post-pay) but were
10 otherwise similar.

11 Although the Company did not establish a control group of non-prepay customers, we can
12 bootstrap a rough control measure by calculating changes in electricity use for all DTE
13 residential electric customers. Using EIA data, I find that the average DTE residential
14 customer used 2.5% less energy in 2015 than 2013.¹¹ One would expect that the first 2.5%
15 of energy use reductions by Pay as You go participants, therefore, were not attributable to
16 the prepay pilot. There are small differences to note between the EIA data and the
17 Company's Pay As You Go data. First, the EIA data is based on calendar years, whereas
18 Pay As You go was analyzed from October to September. Secondly, the EIA data are not

¹⁰ Studies of prepay programs that did not use control groups found reductions of 14% in Montana, 11.1% in Kentucky, 10.4% in Oklahoma, and 5.5% in Washington. Five studies in Tennessee used control groups and found reductions of 5.6%, 6.7%, 5.0%, 6.9%, and 11.7%. See ACEEE, p. 23

¹¹ See Exhibit AGCUB-Bunch6.

1 weather normalized.

2 This retroactive control group estimate, all the same, gives cause to suspect that nearly half
3 of the 6% energy-use reduction claimed for Pay As You Go customers should be attributed
4 to other factors that had nothing to do with the prepay.

5 **Q. What factors, not necessarily unique to Prepay, might cause a Prepay customer to**
6 **reduce their use of energy?**

7 **A.** As I discussed above, the Company proposes that timely communication with customers
8 about their recent and projected energy use and cost is more likely to lead them to change
9 their energy use behaviors than receiving a post-pay bill reflecting past energy use choices.

10 The Company ought to be able to send the exact same kind of information to post-pay
11 customers, as well, without asking them to waive their billing rights and shutoff protections
12 or to pay early. In fact, the Company verifies that it already sends high-usage alerts to
13 customers whose usage is projected to be 20%-150% higher than the same period last year,
14 although it has not evaluated usage and cost impacts of those notifications.¹²

15 Thus, the aspect unique to Prepay is not visibility into and control over customers' energy
16 use and costs that might motivate them to reduce their energy usage more than post-pay
17 customers getting the same advance information – it is that Prepay customers face more
18 dramatic, quicker consequences for failing to pay attention to and act on that information.

19 **Q. What aspects of energy use reduction that are firmly attributable to Prepay may**

¹² Hatsios, response to discovery U-21087- AGCUBDE-1.2ai. Provided in Exhibit AGCUB-Bunch3.

1 **nevertheless be problematic?**

2 **A.** The motivation for prepay customers to reduce their use of energy is problematic, as may
3 be the ways they achieve those reductions.

4 The motivation to reduce energy use that is uniquely powerful for prepay customers is the
5 coercive, constant, and looming prospect of shutoff if their account balance reaches zero.
6 Most, if not all, customers would like to spend less money on electricity; but that does not
7 justify use of any and all means of support and motivation to get them to do so.

8 The ways prepay customers reduce their use of energy also bear careful consideration. We
9 should want customers to reduce wasteful use of electricity without sacrificing quality of
10 service; yet, as I shall argue below, evidence and logic indicate that prepay customers tend
11 less toward energy waste reduction actions and more toward self-deprivation behaviors
12 with electricity usage or other necessities of life in order to feed the meter.

13 **Q.** **How much energy use reduction is associated with self-deprivation rather than**
14 **energy efficiency?**

15 **A.** Studies of prepay programs vary in the extent to which they identify and classify these
16 behaviors; few have even attempted to quantify their impact on energy use and cost. One
17 reason for this lack of information is the difficulty of distinguishing self-rationing/self-
18 deprivation from energy efficiency. Because of the difficulty of detecting and measuring
19 these behaviors and the potential harms that come to customers who practice them, it is

1 important that prepay programs be designed not to encourage them.

2 **Q. How much energy use reduction by prepay customers is attributable to shutoffs?**

3 **A.** Most of the evaluations of other programs "...may have overestimated savings from prepay
4 because they included energy "saved" from disconnections in their savings estimates."¹³

5 The Company's Pay As You Go annual reports reported zero shutoffs and restorations for
6 2014 and 2015, so we can say that the energy-use reductions reported for DTE's pilot are
7 not inflated in that regard. The lack of shutoffs does not mean that participants did not face
8 elevated risk of shutoff: the Company sent large numbers of shutoff alerts during the pilot
9 but evidently exercised discretion by not actually shutting off power to any pilot-program
10 customers. I address shutoff risks and hazards in greater detail below.

11 **Q. How much energy use reduction by prepay customers is attributable to self-**
12 **deprivation or self-rationing behaviors?**

13 **A.** Research has documented prepay customers rationing their use of electricity in order to
14 keep the meter running or reduce costs. A 2010 study in the UK found that 16% of prepay
15 customers had "self-disconnected" at least once over the previous year.¹⁴

16 The UK study included various anecdotes of energy self-rationing behavior reported by
17 prepay customers: one customer reported that she had stopped vacuuming her house and
18 cut back on laundry to keep the meter running. "If my electricity is running low I will turn

¹³ ACEEE, p. 22

¹⁴ "Cutting Back, Cutting Down, Cutting Off: Self-disconnection among prepayment users," Hannah Mummery and Holly Reilly, Consumer Focus, July 2010. p. 17. Provided as Exhibit AGCUB-Bunch7.

1 the fridge off because the fridge takes up most of the electricity in the house.”¹⁵

2 Although the UK study and others have documented various energy self-deprivation
3 behaviors among prepay customers, I have not located any studies that quantify energy use
4 reduction results from self-deprivation. “The Company is not aware of any research that
5 has rigorously and definitively determined how much of these realized reductions are due
6 to conservation versus self-deprivation behaviors.”¹⁶

7 **Q. Are Prepay customers likely to engage in self-deprivation behaviors other than using**
8 **less electricity?**

9 **A.** Yes. Published research and other reporting have identified a variety of sacrifices prepay
10 program participants make to keep the meter running. In the UK study cited above,

- 11 • 54% of prepay customers used “emergency credit” to retain utility service;
- 12 • 22% gave up other necessities (e.g., food) to stay connected.¹⁷

13 “Sometimes I am not able to wash my clothes because I can’t afford the washing liquid to
14 do it, which is not right because I do like to have clean clothes to wear.”¹⁸ One in five
15 respondents reported cutting back on food and leisure specifically in order to buy meter
16 credit.¹⁹

17 The Company’s market research revealed that customers are not very knowledgeable about

¹⁵ Mummery and Reilly, p. 20.

¹⁶ Hatsios, response to discovery question AGCUBDE-1.13a. Provided in Exhibit AGCUB-Bunch3.

¹⁷ Mummery and Reilly, p. 17.

¹⁸ Mummery and Reilly, p. 19.

¹⁹ Mummery and Reilly, p. 21.

1 their billing, payment, and assistance options, other than having a general sense that the
2 Company will provide flexibility to customers who are in arrears.²⁰ This finding helps to
3 explain why customers engage in self-deprivation behaviors. There is nothing to suggest
4 that enrolling customers in Prepay will make them any more knowledgeable about or likely
5 to seek help and options. Indeed, the increased instances of Prepay usage and balance
6 notifications and the effort of making more-frequent payments is likely to leave customers
7 with even less bandwidth to learn about their energy and billing options, and instead lead
8 to increased self-deprivation behaviors.

9 **Q. Why should we be concerned if prepay customers choose to use less energy in order**
10 **to reduce their prepayment and avoid shutoff risk?**

11 **A.** Energy *use* reduction is not the same as energy *waste* reduction. The State, the
12 Commission, and utilities have a strong commitment to energy waste reduction. MCL
13 460.1005(d) defines energy efficiency as “a decrease in customer consumption of
14 electricity or natural gas achieved through measures or programs that target customer
15 behavior, equipment, devices or materials *without reducing the quality of energy services.*”
16 (emphasis added) Using less energy may result from self-deprivation behaviors – such as
17 changing thermostat settings to make premises hotter in summer or colder in winter – that
18 reduce the quality of service a customer enjoys. Energy *waste* reduction is a generally
19 desirable form of energy *use* reduction, but not all forms of energy *use* reduction are

²⁰ Attachment to response to discovery question U-21087 SDE-1.12-01, p. 6. Provided as Exhibit AGCUB-Bunch5.

1 desirable.

2 It is not necessarily a bad thing for a customer to turn down their thermostat in winter and
3 turn it up in summer to save energy. My point is that such choices do not serve the
4 objectives of energy waste reduction programs when they reduce the quality of energy
5 services the customer receives. The Commission should take care not to conflate such self-
6 rationing or self-deprivation choices with energy waste reduction.

7 **Q. All the same, is it possible that Prepay program features will motivate customers to**
8 **reduce energy waste?**

9 **A.** It is plausible that providing Prepay customers with frequent information and forecasts
10 about their energy usage and costs will condition them to be more likely to take energy
11 waste reduction actions.

12 The higher hurdle, however, is customers' ability to follow through on that conditioning.
13 Prepay may appeal largely to customers who are living paycheck to paycheck and can
14 adjust their energy usage to current cash availability and prepay only as much as they can
15 afford. Precisely *because* they are living paycheck to paycheck and have no reserves,
16 though, they have no capital to invest in energy waste reduction improvements to their
17 premises. For that matter, many of them are renters who have little incentive to make their
18 premises more energy efficient because they will not live there long enough to benefit from
19 the improvement. So, the very factors that attract many customers to prepay programs also
20 make them very unlikely to invest in energy waste reduction. Consequently, reductions in
21 energy use among these customers are more likely to result from self-deprivation or self-

1 rationing behaviors, which reduce the quality of energy services those customers receive
2 and are thus not encouraged under the statute.

3 In sum, energy use reductions attributed to prepay customers may be problematic because
4 they result from increased shutoff time or increased self-deprivation behaviors. Not only
5 are these behaviors problematic, but also their cause – the ever-looming threat of shutoff –
6 is problematic as well.

7 **Q. Why should we care what motivates Prepay customers to use less energy?**

8 **A.** The real reason Prepay may more powerfully motivate customers to use less energy, stay
9 current on their bills, and settle arrearages is the escalated threat of short-notice shutoff, a
10 threat comparatively reduced for post-pay customers thanks to the Billing Rules. The
11 ability to motivate behavior by imposing negative consequences does not mean we should
12 do so, especially when there are simpler, less consequential, more proportional ways to
13 motivate that behavior.

14 While the Company is proposing reasonable measures to avoid power shutoffs in
15 circumstances that might cause privation, injuries and deaths, shutoffs, or even the prospect
16 thereof, under any circumstances cause significant inconveniences and burdens to
17 customers. The Commission has developed Billing Rules over the years that strike a
18 careful balance between protecting customers against shutoffs and insecurity, and assuring
19 the Company reasonable success in collecting for the services it provides. The Prepay
20 program would significantly alter that carefully struck balance and the Commission should
21 be skeptical of any alteration. I will discuss below why various waivers requested by the

1 Company are either not necessary or not justified. Granular discussion of each element of
2 the Billing Rules notwithstanding, the Commission should bear in mind that the overall
3 effect of waiving rules would be to put more pressure on customers to pay their electric
4 bills more reliably and promptly through the coercive threat of power shutoffs.

5 **Q. Do prepay customers experience escalated shutoff rates?**

6 **A.** Yes, according to various sources.

7 First, we have evidence from the Pay As You Go pilot. During the twelve months ending
8 September 30, 2015, the Company sent 1,981 shutoff notices. Since we know there were
9 123 customers at the start of that period and only one was added, that is an average of
10 almost 16 shutoff notices per customer for the year, and even higher if some of them
11 unenrolled before the pilot ended.²¹

12 Customer surveys conducted by the industry prepay collaborative in which the Company
13 participates found that 39% of adults 18-54 years old, 41% of renters, and 38% of low-
14 income customers predict that their service would end up being disconnected during their
15 first year of enrollment in prepay.²²

16 Oklahoma Electric Cooperative reported that 43% of its prepay customers experienced a

²¹ U-16457-008, DTE 2015 Annual Pre-pay Pilot Program Annual Report, p. 2. Provided as Exhibit AGCUB-Bunch8.

²² Russell Research, p. 8

1 disconnection in 2013 and 10% experienced 11 or more disconnections that year.²³

2 The stress that the omnipresent risk of shutoff causes to prepay customers is real enough,
3 but data from existing prepay programs shows it is not merely a hypothetical threat. Many
4 prepay customers endure shutoffs and the attendant risks to their health and safety that the
5 Commission normally seeks to minimize.

6 **Q: How do energy use reductions under prepay differ across customer segments?**

7 **A.** In the Pay As You Go pilot, only the low-usage customer segment exhibited significant
8 reductions in energy use that held up over time. These results are based on a small customer
9 sample size, but it is the only evidence we have to go on because other prepay programs
10 have not published energy reduction data segmented by usage tiers.

11 In Pay As You Go, low-usage customers (<450KWh/month) realized the greatest energy
12 use reductions – an average of 14% reduction in their second year on Prepay compared to
13 their pre-enrollment use. Through the second year of the pilot, medium usage customers
14 increased their usage by 1% and high usage customers decreased their usage by only 2%.²⁴

15 Energy use reductions were also inconsistent over time in Pay As You Go. Low-usage
16 customers went from 11% reduction in their first year on prepay to 14% in the second year.
17 Medium-usage customers went from 1% reduction to 1% increase in energy usage over the
18 two years of the program. High-usage customers went from 6% reduction in year one to

²³ US Department of Energy Smart Grid Investment Program, “Bridging the Gaps on Prepaid Utility Service,”
September 2015, p. 9. Provided as Exhibit AGCUB-Bunch9.

²⁴ 2015 Annual Pre-pay Pilot Program Annual Report, p. 5.

1 only 2% reduction in year two, compared to their pre-enrollment levels. So, both medium-
2 and high-use customers backslid toward their historic energy usage patterns as time went
3 on.²⁵

4 These results may illuminate why enrollment in other programs tends to be dominated by
5 lower-income customers. In Pay As You Go, they were the only segment that significantly
6 reduced their energy use and improved over time. Lower-income customers are not the
7 same segment as lower-use customers, but there is substantial overlap. And, as I outlined
8 above, there is cause to suspect that energy use reductions realized by lower-income
9 customers substantially resulted from self-deprivation behaviors.

10 **Q. Please summarize your understanding of energy use reductions that can be attributed**
11 **to prepay programs.**

12 **A.** Prepay program participants generally use slightly less electricity than similarly situated
13 post-pay customers. DTE's prepay pilot results suggested that energy use reductions were
14 significant and lasting only among lower-usage participants. Studies have identified that
15 many prepay customers sacrifice the quality of energy service they receive, or go without
16 other necessities, in order to reduce their energy usage and costs, but have not quantified
17 how much energy use reduction can be attributed to these self-deprivation behaviors. Thus,
18 we cannot say with confidence to what extent energy use reductions experienced by Prepay
19 customers will result from energy waste reduction activities prioritized by statute.

20 **Q. Given what we know about energy use reduction by prepay program participants,**

²⁵ 2015 Annual Pre-pay Pilot Program Annual Report, p. 5.

1 **how much weight should the Commission give to energy use reduction potential in its**
2 **consideration of the Company's Prepay proposal?**

3 **A.** Potential changes in energy use among Prepay program participants should not factor into
4 the Commission's consideration of the Company's proposal.

5 Though it appears that some prepay program participants use less energy, it is not clear that
6 this reduction results from behaviors the Commission should wish to encourage.

7 The Commission should be very wary of the coercive motivation to reduce energy use
8 heightened by waiving Billing Rules that protect customers against unreasonable shutoff
9 risks.

10 In short, too little is understood about the impact of prepay programs on customer behavior
11 to know what energy-use outcomes prepay should seek. Rather, the Commission should
12 seek and measure energy use reductions through existing energy waste reduction offerings.
13 To the extent that Prepay customers reduce energy use owing to energy waste reduction
14 efforts, these gains should reflect on the effectiveness of energy waste reduction programs
15 and not Prepay.

16 **Q.** **The Company also claims that Prepay will give participants the ability to pay on a**
17 **schedule that they establish and that better meets their needs. What is your evaluation**
18 **of this claim?**

19 **A.** The Company already offers various payment flexibility options to customers. There is

1 nothing about Prepay that uniquely improves those options.

2 First, any post-pay customer is entitled to make a payment of any amount on their account
3 at any time, if they pay the balance before the due date. Described that way, payment
4 options and benefits for post-pay customers are indistinguishable from those for Prepay
5 customers.

6 BudgetWise Billing and autopay options also help post-pay customers schedule how much
7 they pay and when.

8 It strains credulity to contend that Prepay, by frequently confronting customers with the
9 need to pay into their account or suffer from shutoff, meets customer needs better than
10 post-pay, which provides considerably more forbearance for partial or late payments,
11 provides customers time to access assistance, and generally avoids using shutoff as a
12 consequence if the customer is making a reasonable effort to pay on their account.

13 **Q. The Company claims Prepay can eliminate customer billing surprises and even out**
14 **seasonal cost fluctuations. Is this accurate?**

15 **A.** Whether it is accurate or not is secondary to it being misleading. It is misleading to claim
16 a benefit for a particular program that customers could more easily and effectively receive
17 without switching. Again, the Company could offer the exact same information to post-
18 pay customers as it proposes for Prepay, without asking them to waive their rights under
19 the Billing Rules and pay for electricity usage in advance. It is not the act of paying in

1 advance that eliminates surprises – it is the provision of information in advance.

2 It is worth noting, however, that customers who receive advance projections of energy use
3 and cost can still be surprised, for example when their bill is projected to spike because of
4 extreme weather conditions. The best way for a customer to reduce surprises is to enroll
5 in BudgetWise Billing, which allows them to know how much they will be asked to pay
6 every month for the next year. BudgetWise Billing, of course, is not compatible with
7 Prepay.

8 Prepay is an even less helpful way to even out seasonal fluctuations. Prepay might help
9 customers blunt the worst peaks in usage and cost by providing advance warning, but
10 describing these marginal reductions as “evening out” large seasonal fluctuations is a
11 wishful exaggeration. If customers’ primary desire is to even out cost fluctuations, a more
12 effective and simpler choice would be to enroll in BudgetWise Billing without giving up
13 their rights under the Billing Rules and paying in advance for electricity. Again,
14 BudgetWise Billing is incompatible with Prepay.

15 Unfortunately, the Company’s own customer focus-group research reveals that only “A
16 few recognized BudgetWise Billing as an option, although as we often see in qualitative
17 discussions, customers often confuse BWB with a customized payment plan to address an
18 account in arrears rather than recognizing it as an ongoing strategy for evening out
19 fluctuations in bills.”²⁶ The solution to billing surprises and fluctuations in bills, then,
20 clearly would be for the Company to better inform customers of their billing options.

²⁶ Emicity, p. 6.

1 Instead, the Company proposes a new Prepay program that logically cannot be expected to
2 yield nearly the results of BWB and requires concessions from customers (billing rules
3 waivers, prepayments) that are irrelevant to enabling provision of the asserted benefit.

4 **Q. The Company claims that Prepay would provide a simplified billing experience that**
5 **eliminates the need for what some customers find a complicated monthly bill. How**
6 **do you evaluate this claim?**

7 A. Providing a bill that customers can understand is not somehow made easier if customers
8 pay for their energy in advance and waive their rights under the Billing Rules. There is
9 simply no plausible relationship between the program requirements and costs and this
10 claimed benefit.

11 As I noted above, the Company can just as easily send the kinds of cost and usage updates
12 and projections it envisions for Prepay to its post-pay customers, while continuing to send
13 them post-pay bills per usual. If the Company believes its bills and billing processes are
14 too complicated for some customers then it should change them without demanding undue,
15 burdensome, and irrelevant concessions from those customers.

16 The Company projects, moreover, that customers will make three to seven prepayments
17 per month on average²⁷ – each of them preceded by balance notifications at five, three, and
18 one day(s) before zero balance. It is difficult to comprehend how customers would
19 experience such a vast escalation in the number of billing interactions as simplification.
20 Underscoring this point, “...while some disconnections result from budget constraints,

²⁷ Hatsios, response to discovery question U-21087-AGCUBDE-1.3ci. Provided in Exhibit AGCUB-Bunch3.

1 most customers claim they occur due to forgetfulness or lack of time.”²⁸

2 **Q. The Company states that Prepay customers with past-due balances can apply a**
3 **portion of each prepayment towards the reduction of any past-due balance. How do**
4 **you evaluate this purported benefit?**

5 **A.** Time to make payments and ability to access payment assistance are unquestionably
6 greater for post-pay customers than under Prepay. Post-pay customers can certainly also
7 pay what they want, when they want, if they pay off their balance by the due date, so
8 flexibility is not fundamentally better for Prepay customers.

9 Notwithstanding, studies of prepay programs claim significant reductions in arrearages and
10 uncollectible write-offs. One study by a prepay vendor found four of its customer utilities
11 averaged 72% reduction in bad debt owed by prepay customers.²⁹ None of the studies cited
12 by the industry collaborative in which DTE participates used control groups, however,
13 making it impossible to be sure arrearages and uncollectibles among prepay customers are
14 managed better than among post-pay customers. A better study design would compare
15 arrearages and uncollectibles among prepay customers to those for post-pay customers on
16 payment plans, post-pay customers receiving assistance, and/or post-pay customers owing
17 arrearages but not on plans or assistance. Impressive as the numbers reported by the
18 industry collaborative seem to be, they do not rigorously support a conclusion that

²⁸ ACEEE, p. 36, citing Mummery and Reilly and other studies.

²⁹ “Impact of Prepay on Utility Arrearages and Customer Satisfaction,” Prepay Energy Working Group, May 2020.
p. 2. Attachment to response to discovery question U-21087-SDE-1.3-02. Provided as Exhibit AGCUB-Bunch10.

1 arrearages and uncollectibles are better managed by prepay than by post-pay customers.

2 Even were we able to rigorously show that prepay programs better reduce arrearages and
3 uncollectibles, we would still be confronted with the problematic motivation prepay exerts
4 on its customers to pay up – namely, the threat of shutoff if they fail to pay down their
5 arrearages.

6 The Company’s proposal is misleading on this issue, stating that “...an additional benefit
7 of Prepay, for customers with past due balances, is the ability to apply a portion of each
8 prepayment they make towards the reduction of any past due balance.”³⁰ This misleadingly
9 suggests it is up to the customer to decide whether and how much of each prepayment to
10 apply toward a past due balance. Later, though, witness Hatsios states, “...in the case of
11 customers who choose to roll over a past due balance, 80% will go towards their future
12 consumption and 20% will be applied to any past due balance through the Prepay Deferred
13 Payment Plan...”³¹ So, paying down arrears is not an “additional benefit” of Prepay, it is
14 rather a requirement. Customers would not have discretion whether to assign part of each
15 prepayment to arrears, or even how much.

16 From a review of DTE’s proposal, it appears that the way Prepay “helps” customers
17 manage their arrears better than payment plans available to post-pay customers is by
18 forcing them to pay a certain percentage toward arrears while the threat of a more imminent
19 shutoff is present. Given the evidence before us, we cannot confidently say that this
20 approach results in faster arrearage reduction than existing post-pay options, and even if it

³⁰ Hatsios, Direct Testimony, p. 6:1-3.

³¹ Hatsios, Direct Testimony, p.15:3-5.

1 does, we should be mindful of the human cost of achieving that outcome using coercive
2 incentives.

3 **Q. Is automatic shutoff when zero balance is reached an indispensable element of prepay**
4 **programs?**

5 **A.** No, it is perfectly workable to offer prepay without automatic shutoff. Eliminating the
6 coercive influence of short-notice, automatic shutoffs would address many of my concerns
7 with the Company's proposal. A simple alternative would be to flip a Prepay customer
8 back to post-pay status if they failed to resolve a zero- or negative-balance situation
9 promptly. If the primary benefit for prepay customers is timely feedback about usage and
10 costs that more effectively motivates behavior changes than post-pay billing, then
11 eliminating automatic shutoffs will not reduce realized benefits.

12 I note, however, that eliminating automatic shutoff at zero balance sharply diminishes the
13 customer's incentive to reduce energy use and maintain a positive balance. A prepay
14 feasibility study conducted for the Minnesota Department of Commerce, for example,
15 projected 8.5% energy use reduction with automatic shutoff and only 2% reduction if
16 prepay customers were reverted to post-pay rather than being disconnected.³² The latter
17 figure was based partly on data gleaned from energy use reductions experienced by users
18 of DTE's Insight app. This difference between energy use reductions in the two scenarios

³² ACEEE, p. 44.

1 serves to further illustrate the coercive power of the threat of shutoffs.

2 **IV. CUSTOMERS DO NOT WANT THE PREPAY VALUE PROPOSITION THE**
3 **COMPANY IS OFFERING**

4 **Q. Why do you argue the Company is offering a value proposition that customers do not**
5 **want?**

6 **A.** First, the Company already offered a prepay pilot (Pay As You Go) and customers voted
7 against it, as the saying goes, with their feet. It is not apparent what the Company learned
8 from that pilot nor how those learnings shaped the instant proposal.

9 Second, the Company's recent market research revealed that many customers expect to be
10 charged a lower rate in return for paying early, but the Company proposes to charge Prepay
11 customers the same rate as post-pay.

12 **Q. Please describe participation outcomes of the Pay As You Go pilot.**

13 **A.** The program was simply not very popular with customers. The Commission authorized
14 the Company to enroll up to 1,500 customers in Pay As You Go. The Company's 2015
15 annual report states that a two-year cumulative total of 621 residential customers were
16 disenrolled, which I understand to mean that 621 total customers were enrolled in the
17 program at one point or another. Ongoing enrollments and disenrollments meant that the
18 instantaneous total was always smaller.

19 The numbers reported by the Company suggest both marketing and enrollment shortfalls
20 as well as customer retention issues. The approved enrollment cap of 1,500 customers was

1 never remotely approached. The Company's annual report does not discuss marketing and
2 enrollment efforts and learnings. The instant proposal does not make clear what the
3 Company learned from its inability to reach target enrollment in the pilot and how it
4 proposes to do better this time around.

5 Not only did enrollment fail to approach its targets, but customer retention was also weak.
6 The Company's 2014 annual report states that 195 residential customers enrolled from the
7 program in the 12 months ending September 30, 2014, but during the same period 402
8 disenrolled, leaving only 121 customers enrolled at the end of the reporting period.³³

9 Similar analysis of the 2015 annual report is not useful because only one customer enrolled
10 all year and disenrollments were not subtotaled into customer choice and program
11 termination causes. The report gives no indication that the Company even noticed how
12 many customers quit the pilot, much less why. The instant proposal does not clearly
13 describe how the Company would adjust Prepay to improve upon the problems of customer
14 retention experienced in the pilot.

15 A program that loses more than twice as many customers as it gains during its ramp-up
16 period (2013-2014) can scarcely be described as responsive to market demand. The 2015
17 annual report summarizes participant feedback with emphasis on positive feedback and
18 expressions of regret that the program was ending. Negative feedback almost all comes
19 from just "some" or "a few" customers. The report provides no analytical discussion or

³³ "Pre-Pay Pilot (Pay As You Go) Program – 2014 Annual Report", DTE Electric, October 30, 2015, Case U-16457-008, p. 1. Provided as Exhibit AGCUB-Bunch11.

1 quantitative analysis of the feedback or customer attrition.

2 **Q. Do other prepay programs report high levels of customer satisfaction?**

3 **A.** Yes, they do. But every one of these studies suffers from a fatal methodological flaw: they
4 surveyed only customers who stayed in the program, creating a powerful confirmation bias.
5 Had DTE conducted a satisfaction survey using this approach, it would have surveyed only
6 the 121 customers who remained in the program as of September 30, 2014, and ignored
7 the 402 who disenrolled. To its credit, DTE did report some qualitative feedback from
8 participants who disenrolled, though it did not conduct an overall satisfaction study.

9 **Q. Did the Company apply learnings from the pilot to the instant Prepay proposal?**

10 **A.** The Pay As You Go pilot is barely mentioned in the current proposal. “The Company is
11 also leveraging lessons learned from its own “Pay As You Go” pilot...”³⁴ is merely asserted
12 without any elaboration in the filing. Though the Company’s pilot program annual reports
13 detailed a variety of qualitative feedback from participants, the reports did not summarize
14 that feedback nor is it straightforward to cross-reference that content to the current
15 proposal.

16 The only other mention of learnings from the pilot in the current proposal, which I
17 referenced above, is about the 6% energy use reduction among the few participants who

³⁴ Hatsios, Direct Testimony, p. 5:4-5.

1 stayed enrolled long enough to allow for longitudinal comparison.³⁵

2 **Q. Did the pilot generate learnings about what customers seek in a prepay offering and**
3 **how best to provide it?**

4 **A.** The annual pilot reports offer scant evidence supporting several primary benefits witness
5 Hatsios asserts customers will receive from Prepay:

- 6 • *Visibility into, and a greater sense of control over, their energy usage and how*
7 *much they spend.* We know that customers want to spend less money on electricity.
8 The pilot did not provide statistically significant, methodologically robust findings
9 on energy use and the annual reports did not address customer cost at all.
- 10 • *The ability to pay on a schedule that they establish and that better meets their*
11 *needs....* The annual reports include anecdotal customer feedback about their
12 experience with prepayments but provide no data or commentary on frequency or
13 size of prepayments.
- 14 • *A simplified billing experience that eliminates the need for what some customers*
15 *find a complicated monthly bill.* While the annual reports include customer
16 feedback and commentary on customer communications and billing, the reports did
17 not assess whether customers found the prepay billing process to be simpler and
18 did not explicitly compare prepay to post-pay bill content and process.
- 19 • *Customers with past-due balances can apply a portion of each prepayment towards*
20 *the reduction of any past-due balance.* The annual reports include no data or

³⁵ Hatsios, Direct Testimony, p. 10:9-12.

1 commentary on changes in customer arrearages under the prepay pilot but do note
2 that no changes in uncollectibles were identified.

3 In short, the pilot was not a hit with customers, was too small to generate robust findings,
4 and was not even designed to assess demand for and ways to deliver key benefits the
5 Company now asserts its customers want.

6 **Q. The Commission approved waiver of several Billing Rules under the pilot program.**
7 **What was learned from granting those waivers?**

8 **A.** The 2014 and 2015 annual pilot program reports do not mention the waivers.

9 The pilot-program waivers were for sections of the Rules requiring that customers be sent
10 a monthly bill, that they have at least 21 days to pay it, and providing at least ten days of
11 notice before shutting off service. Without data, analysis, or discussion of those waivers
12 in the annual reports, along with the lack of data and failure to design the program to help
13 assess key asserted benefits, it is impossible to comment on whether those waivers were
14 justified.

15 Despite these limitations of the pilot program, in the instant proposal the Company is
16 requesting a much broader set of rule waivers.

17 **Q. What customer preferences for Prepay were revealed in recent market research that**
18 **are not reflected in the Company's proposal?**

19 **A.** “For customers on autopay and/or BWB, the plan had very little appeal... As a result of
20 DTE's gaining earlier control of their money, the only possibility some of these customers

1 saw for considering the Prepay program would be if it provided ongoing discounts to their
2 electricity bill as a trade-off for paying early.”³⁶

3 Customers recognize that their prepaid funds could be working for them rather than earning
4 interest for DTE and that they could use those funds to cover other household expenses.
5 For example, take a Prepay customer who usually pays for ten days in advance, on the 1st,
6 11th and 21st of each month. Had they remained as a post-pay customer, their payment
7 would be due around the 25th of the following month.³⁷ Therefore, the Company is
8 receiving this customer’s payment 35-55 days earlier than had they remained on post-pay.
9 This is a significant timing difference and one can readily understand why customers might
10 think they should get a better deal in return for paying so much earlier.

11 **Q. Is there reason to believe that Prepay customers cause lower costs?**

12 **A.** There are at least three ways Prepay customers might cause lower costs than post-pay
13 customers.

14 First, witness Hatsios states, “...as more and more customers voluntarily enroll in Prepay,
15 these customers will have less propensity to contact the Company to discuss their bill.”³⁸
16 Thus, the Company may have lower Customer Representative and other account
17 maintenance costs. Hatsios confirms, “...the Company expects that as more and more

³⁶ Emicity, p. 14.

³⁷ Per Billing Practice Rules, bills are due no sooner than 21 days after issuance. Example assumes customer is billed shortly after the end of each calendar month, on approximately the 3rd day of the following month.

³⁸ Hatsios, response to discovery question U-21087-AGCUBDE 1.10ai. Provided in Exhibit AGCUB-Bunch3.

1 customers voluntarily enroll in Prepay, these customers will have less of a propensity to
2 contact the Company to discuss their bill.”³⁹

3 Second, the Company projects that Prepay customers will avoid and/or manage arrears
4 more effectively and promptly than post-pay customers, which should reduce billing and
5 collection expenses for the Company.

6 Third, the Company’s working capital will be reduced because it will receive payments
7 around six weeks earlier and will carry lower arrears balances on Prepay accounts.
8 However, the Company admits it has not assessed impact on costs due to changes in
9 working capital.⁴⁰

10 Although the Company’s market research clearly identified customer expectations for
11 lower Prepay rates, witness Hatsios does not explain why no discount is proposed. If the
12 Company’s expectations for Prepay are correct, then it is reasonable of customers to expect
13 a discount and fair that they should receive one.

14 On the other hand, if the Company does not expect Prepay to be more cost-effective than
15 leaving customers on post-pay, then arguably the Company has no case for offering Prepay.

16 **V. WAIVING THEIR RIGHTS UNDER THE BILLING RULES AND PAYING FOR**
17 **ELECTRICITY IN ADVANCE WOULD NOT BE TRULY VOLUNTARY FOR**
18 **MANY CUSTOMERS**

19 **Q. Enrollment in Prepay will be voluntary. Why should we not let customers decide for**

³⁹ Hatsios, response to discovery question U-21087-AGCUBDE-1.10ai. Provided in Exhibit AGCUB-Bunch3.

⁴⁰ Hatsios, response to discovery question U-21087-AGCUBDE-3.29a. Provided in Exhibit AGCUB-Bunch12.

1 **themselves whether the benefits outweigh the risks and costs?**

2 **A.** A voluntary program should provide customers with viable alternatives that they know
3 about and understand. Customers who make a choice while ignorant of viable options, or
4 due to a of lack of viable options, have not made a truly voluntary choice. Evidence
5 suggests that many potential prepay customers do not make a truly free and informed
6 choice. Describing their enrollment in Prepay as voluntary would be misleading.
7 Requiring that they waive their protections under the Billing Rules when they have, or
8 know about no other viable option, would be unfair.

9 Furthermore, the Commission should appreciate that a supposedly voluntary agreement in
10 which the parties have asymmetrical information is not a fair agreement. It is likely that
11 many customers will assess the risks and responsibilities of Prepay unrealistically. People
12 tend to be optimists: they assume they will have more money in the future and more time
13 and discipline to keep their affairs in order. Thus, the Commission should not allow
14 customers to waive their rights purely because they may be willing to do so. If deciding to
15 move forward with a program, the Commission should assure itself that there are customers
16 for whom Prepay makes sense and that outreach to them meaningfully informs them of
17 their responsibilities, rights, and alternatives.

18 **Q. Why might some customers lack viable alternatives to Prepay?**

19 **A:** Some customers have difficulty meeting the requirements to establish a post-pay account,
20 such that signing up for Prepay would not be meaningfully voluntary. Witness Hatsios
21 cites, for example, renters and college students for whom Prepay eliminates the need for

1 complicated ID validations and document submissions.⁴¹ Witness Hatsios also cites
2 avoiding the added costs of deposits as a benefit for Payment Troubled and Vulnerable
3 Customers.⁴²

4 Witness Hatsios' testimony also provides an example of an existing customer being
5 presented with no option other than switching to Prepay. His "Moderate Income Suburban
6 Couple customer journey" includes the following exchange:

7 *Customer: "...our electric service has been shut off. We can't afford this bill but*
8 *need our service reconnected."*

9 *CR: "...Unfortunately, you're not eligible for a payment plan, so to restore you will*
10 *have to pay the balance due and a deposit."*

11 *Customer: "We cannot afford that... We need help?"*

12 *CR: "Well, we are offering a new program called Prepay that could work for*
13 *you...."*⁴³

14 This exchange suggests the Customer Representatives will be trained to put greater
15 emphasis on flipping customers to Prepay than in carefully searching for payment plan or
16 assistance options. The main point here, however, is that signing up for Prepay is in no
17 normal sense of the word "voluntary" for this customer, since the only other option being

⁴¹ Hatsios Direct Testimony, p. 7:18.

⁴² Hatsios Direct Testimony, p. 8:21.

⁴³ Hatsios, Exhibit A-1, p. 4/4.

1 presented is continued disconnection.

2 **Q. What evidence do you have that Prepay is not meaningfully voluntary for some**
3 **customers because they do not know about their options?**

4 **A.** Market research performed by the Company shows that many customers do not know about
5 payment, billing, and assistance options the Company offers.⁴⁴ Those who do are unlikely
6 to be interested in Prepay because they recognize they have better alternatives. For
7 example, customers enrolled in auto-pay and Budget-Wise Billing (BWB) see very little
8 value for themselves in Prepay; the only reason they would sign up for Prepay is if they
9 were offered a lower rate, which is not part of the Company's plans.⁴⁵ The Company also
10 views "Young and Tech Savvy" customers as a key target market segment for Prepay,
11 citing high use of the DTE Insight app by this segment – seemingly ignoring that the app
12 gives these customers all the insight and control over their energy use they would have
13 with Prepay, while preserving their billing rights and avoiding the bother of constantly
14 monitoring and maintaining their account balances.

15 If the Company truly wants to give its customers greater insight and control over their
16 energy use, it should put its efforts into greater promotion and education of its existing rate,
17 billing, and assistance options, which work well for customers who know about them. This
18 approach would be greatly preferable to the Company using Prepay to focus its customers'
19 minds on reducing energy use and cost through the coercive, drastic, and constant specter
20 of power shutoffs.

⁴⁴ Emicity, p. 6.

⁴⁵ DTE Prepay Program Study 2015 Final Report, pp. 6, 14.

1 **VI. THE COMMISSION SHOULD NOT WAIVE THE BILLING PRACTICE RULES**

2 **Q. Why are the Billing Practice Rules important?**

3 **A.** According to the MPSC’s Issue Brief on the Billing Practice Rules, “Electricity and natural
4 gas are essential services that customers depend on. The rules strike a balance between
5 protecting customers from discriminatory or predatory billing and service
6 practices...Customers rely on the rules to ensure that they are not unfairly deprived of
7 utility service and are billed properly for that service.”⁴⁶

8 **Q. Would the Company’s requested waivers to the Billing Practice Rules maintain the**
9 **intent of the Rules?**

10 **A.** No, they would not. The Company’s requested waivers and the practices those waivers
11 would allow would expose customers to shutoff risks with much less notice, weaken
12 protections against shutoff when charges are disputed, and leave customers with little time
13 to evaluate billing notices, access funds, and respond. During extreme weather events,
14 customers short on cash might face the necessity of going without other essentials or
15 curtailing their energy use to an extent that compromises their health and safety – a
16 dilemma not faced by post-pay customers who can average unusually high usage spikes
17 out over a full billing period.

18 **Q. No customer would be forced to sign up for Prepay and waive their rights under the**
19 **Billing Practice Rules. Why should the Commission restrict customer choice?**

⁴⁶ Available at, https://www.michigan.gov/documents/mpsc/MPSC_Issue_Brief_-_Billing_Rules_606562_7.pdf.

1 A. The Billing Practice Rules are in place to protect all customers. As a general rule, the
2 Commission should be reluctant to ever waive customer protections. If the Commission
3 does go down that path, it should ensure that agreements that may involve waivers of rights
4 are fair and truly voluntary. An agreement offered by the utility is not truly voluntary if it
5 is too complicated for many customers to fully review and understand, if the customer has
6 no reasonable alternatives to accepting the agreement, or if the utility has power to
7 essentially compel the customer to accept the agreement. All three of these elements are
8 present with Prepay and the Commission should therefore be very wary of any waivers of
9 the Billing Practice Rules.

10 **Q. Which requested waivers should the Commission approve?**

11 A. The Commission should not approve any waivers. For the most part, the Company is
12 offering alternatives which could easily be made compatible with the Rules. If adjustments
13 are needed, they should be made to the Prepay program, not to the Rules.

14 My testimony up to this point has established three general points about proposed waivers:

15 First, in principle, the Commission should not encourage waivers of rights, even if
16 the customer may receive some valuable benefit in return.

17 Second, in the instant case, the Company has failed to demonstrate that customers
18 will receive a net benefit from this program. The amount, nature and cause of
19 energy use reductions and cost savings customers are likely to experience are
20 suspect. Other benefits the Company proffers could just as easily be offered to

1 post-pay customers without asking them to waive their rights and pay in advance
2 for electricity. Prepay customers would receive no rate reduction in return for
3 paying early. Finally, the risks to customers are well documented in the history of
4 other prepay programs.

5 Third, the Commission should be mindful that it previously granted the Company
6 a more limited set of waivers to conduct its prepay pilot, Pay As You Go. The pilot
7 provided the Company with ample opportunity to demonstrate that waivers of
8 Billing Practice Rules were justified. Yet, the Company did not design the pilot to
9 answer important questions about the impact of waivers, did not evaluate the role
10 of the waivers in the administration and outcomes of the pilot in its annual reports,
11 and likewise fails in the instant proposal to address the pilot experience with
12 waivers. It would not be prudent for the Commission to grant more extensive
13 waivers now, given the Company's demonstrated indifference in its administration
14 of the pilot program.

15 Should the Commission not find those arguments to be dispositive, I argue below that the
16 Company does not make a case that observance of specific Rules would somehow prevent
17 it from offering Prepay. The Company is arguing that it would provide adequate
18 protections and processes in other ways, not that existing requirements prevent it from
19 offering Prepay. The Company is also arguing customers would voluntarily waive rights,
20 without establishing why those waivers are necessary for administration of the program.
21 The Company's case for waivers boils down to convenience, not necessity. However the

1 Commission should waive Rules only when doing so is compelling and necessary, not
2 merely convenient.

3 **Q. Why should the Commission not grant waiver of Rule 4601.120(3), Billing Frequency;**
4 **method of delivery?**

5 **A.** There is nothing to prevent the Company from sending Prepay customers a bill at least 21
6 days before their balance is projected to hit zero. It may be harder to accurately predict
7 usage that far into the future, but the Rules represent the Commission’s best judgement that
8 customers need more time to render payment than the 5 days, or less, provided by the
9 Company’s proposed low-balance notices.

10 Witness Hatsios states, “The concept of a monthly bill with a due date does not exist for
11 prepaid utility services.”⁴⁷ Yet the Company proposes to send customers a monthly
12 summary, which could also project at least 21 days in advance how much the customer
13 should prepay to avoid hitting zero balance. Thus, it is not necessary to waive this Rule to
14 offer Prepay.

15 **Q. Why should the Commission not grant waiver of Rule 460.129(4), concerning content**
16 **of past-due notices?**

⁴⁷ Hatsios, response to discovery question U-21087-AGCUBDE-2.17c. Provided in Exhibit AGCUB-Bunch13.

1 A. Witness Hatsios states, “Prepay customers will not receive past-due notices....”⁴⁸ There is
2 no reason to waive requirements relating to the content of past-due notices if Prepay
3 customers will not receive them at all.

4 **Q. Why should the Commission not grant waiver of Rule 460.139(1), concerning mailed**
5 **notice of shutoff date?**

6 A. The Commission established this requirement because mailed notices are the most reliable
7 way to communicate with customers in the sense that every customer has a mailing address.
8 In contrast, customers may not always have use of a mobile phone to receive texts and
9 calls, or access to Internet service to receive emails and access their accounts online.
10 Lower-income customers – those most likely to enlist in prepay programs elsewhere – are
11 also the most likely to lose access to a mobile phone, email, or the Internet after enrolling
12 the program. Self-deprivation choices encouraged by prepay may well include suspending
13 or forgoing mobile phone and Internet service in order to keep the electric meter running.
14 While the Company will require customers to provide an email, text, or mobile phone
15 number to sign up for Prepay, there is no assurance that customers who are living paycheck
16 to paycheck will always have access to those services.

⁴⁸ Hatsios, response to discovery question U-20187-AGCUBDE-2.17a. Provided in Exhibit AGCUB-Bunch13.

1 Witness Hatsios admits that the Company does not have information about how many, or
2 how often, customers do not have access to text messaging or cell phone service⁴⁹, the
3 Internet⁵⁰ or e-mail.⁵¹

4 Witness Hatsios states the Company will monitor these communications to attempt to
5 identify when customers have not received notifications and will defer disconnection while
6 it reaches out via other means to the customer.⁵² This precaution is helpful but the
7 Company will not always know when its electronic communications have not been
8 received or opened.

9 Furthermore, the Commission established the means and timing of shutoff notices mindful
10 of how reliably and urgently customers monitor and respond to communications coming
11 through various channels. Even if there are other means to communicate with customers
12 about impending shutoffs, the Commission has previously determined that notification by
13 first-class mail is indispensable. Because such notification is additional to, and does not
14 preclude, the other forms of shutoff communications the Company proposes to provide to
15 Prepay customers, and because there remains a reasonable understanding of how to apply
16 this Rule in the Prepay context, the Commission should not waive it.

⁴⁹ Hatsios, response to discovery question U-21087-AGCUBDE-1.12-ai. Provided in Exhibit AGCUB-Bunch3.

⁵⁰ Hatsios, response to discovery question U-21087-AGCUBDE-1.12-aii. Provided in Exhibit AGCUB-Bunch3.

⁵¹ Hatsios, response to discovery question U-21087-AGCUBDE-1.12-aiii. Provided in Exhibit AGCUB-Bunch3.

⁵² Hatsios, response to discovery question U-21087-AGCUBDE-1.12b. Provided in Exhibit AGCUB-Bunch3.

1 **Q. Why should the Commission not grant waiver of Rule 460.139(6) and Rule 460.143(1),**
2 **concerning urgent communications with customers shortly before shutoff is carried**
3 **out?**

4 A. Waiver of these Rules is not necessary to administration of Prepay. The Company can
5 reach out to Prepay customers by phone, or other means, shortly before a disconnection,
6 and communicate all the same information as it does to post-pay customers in the same
7 circumstances. The Company contends it is sufficient, in the alternative, to inform
8 customers about automatic, remote shutoffs when they enroll in Prepay.⁵³ These Rules,
9 however, represent the Commission's best judgment that timely notification about shutoffs
10 is fair and necessary, and nothing about administration of the Prepay program precludes
11 making such notifications.

12 It would be much more straightforward to interpret this Rule in the Prepay context than to
13 waive it. The Company proposes to send customers communications via their preferred
14 channel at 5, 3, and 1 day(s) before zero balance. There appears to be no reason why those
15 communications could not reasonably satisfy the requirements of this Rule.

16 **Q. Why should the Commission not grant waiver of Rule 460.140(1), regarding content**
17 **of shutoff notices?**

18 A. Witness Hatsios clarifies that shutoff "...notifications will not include the information
19 included in sections d through j..."⁵⁴ These sections cover the customer's rights regarding

⁵³ Hatsios, response to discovery question U-21087-AGCUBDE-2.23a. Provided in Exhibit AGCUB-Bunch13.

⁵⁴ Hatsios, response to discovery question U-21087-AGCUBDE-2.21a. Provided in Exhibit AGCUB-Bunch13.

1 payment plans, settlement agreements, complaints, hearings, and how to communicate with
2 the utility about the same.⁵⁵ He explains, "...the excluded items are not necessary for
3 Prepay customers as they are in control of how much and how frequently they pay and see
4 daily how many days of usage they have left. There would be no past due amount to
5 dispute."⁵⁶

6 Witness Hatsios dodges the question. It is completely foreseeable that a Prepay customer
7 might wish to dispute charges against their prepaid account that hasten their balance hitting
8 zero.

9 Prepay customers would receive shutoff notices, which are the subject of this Rule. The
10 low-balance alerts described by witness Hatsios, which notify the customer of shutoff on a
11 certain date unless they pay more money, serve the same purpose as shutoff notices even
12 if they are renamed and serve additional functions. The Commission has already
13 determined what information should be contained in shutoff notices. Providing that
14 information is not incompatible with Prepay and communicating it consistent with this
15 Rule does not preclude the Company from communicating with customers at other times
16 and in other ways about disconnection. There is no justification for waiving this Rule.

17 **Q. Why should the Company not waive Rule 460.140(2), concerning the content of**
18 **shutoff notices sent to customers?**

⁵⁵ Hatsios, response to discovery question U-21087-AGCUBDE-2.21a. Provided in Exhibit AGCUB-Bunch13.

⁵⁶ Hatsios, response to discovery question U-21087-AGCUBDE-2.21b. Provided in Exhibit AGCUB-Bunch13.

1 A. Section (a) of this Rule applies to combination (electric + gas) customers, who would not
2 be eligible to enroll in Prepay. This section is irrelevant to Prepay and therefore there is
3 no reason to waive it.

4 Section (b) requires shutoff notices to contain information about contacting social service
5 agencies about energy assistance programs. Similarly, section (e) requires shutoff notices
6 to include the telephone number for DHS or 211. Witness Hatsios explains, "...Prepay
7 customers who are nearing a zero-balance will be provided, in their low-balance alerts,
8 Company contact information for assistance and link to the energy assistance pages of the
9 Company website."⁵⁷ Rather than waiving these sections, a much more straightforward
10 solution would be to ensure that "low-balance alerts" satisfy their requirements.

11 Section (c) requires notification that customers may become ineligible for energy
12 assistance if they sign a settlement agreement with the utility. Section (g) requires that a
13 shutoff notice suggest that the customer contact the utility about shutoff protection
14 programs. These requested waivers show that the Company's approach to Prepay would
15 conceal options from vulnerable customers and in doing so reinforce coercive pressure to
16 pay their bill today. Customers in financial distress should be reminded that settlement
17 agreements and protection plans are available, how they could pursue these options, and
18 how that might affect their rights and eligibility for assistance.

⁵⁷ Hatsios, response to discovery question U-21087-AGCUBDE-2.22b. Provided in Exhibit AGCUB-Bunch13.

1 Section (d) requires a shutoff notice to contain information about winter protection plans.
2 Witness Hatsios explains, "...through the acknowledgement of the program Terms and
3 Conditions, customers who voluntarily enroll in Prepay understand that they cannot be
4 enrolled in another plan, but that they can unenroll from Prepay at any time without penalty
5 if they wish to enroll in a payment plan, including winter protection."⁵⁸ It is not reasonable
6 to assert that customers will reliably remember the fine-print terms of their enrollment in
7 Prepay while facing the stressful and hectic financial and life circumstances that precede
8 shutoff. For that matter, they may very well have lost online access to review the program
9 terms and/or be unable to find whatever written materials they received, if any. The only
10 harm in reminding them of this option is that it reduces the coercive pressure on them to
11 ration more scarce cash to pay the electric bill first – which pressure may expose the
12 customer to other harms of deprivation.

13 Section (f) requires shutoff notices to include information about medical emergency
14 deferrals. Witness Hatsios explains, "...customers with certified medical emergencies will
15 not be able to enroll in Prepay...",⁵⁹ which is also true but unhelpfully narrow. Unless
16 participation in Prepay inexplicably confers perfect health on customers, they may suffer
17 from medical emergencies *after* enrolling in Prepay. Assuming the latter case, there is no
18 good reason why a shutoff/low balance notice sent to a Prepay customer should not notify
19 them of their rights if they, or a member of their household, is having a medical emergency.

⁵⁸ Hatsios, response to discovery question U-21087-AGCUBDE-2.22c. Provided in Exhibit AGCUB-Bunch13.

⁵⁹ Hatsios, response to discovery question U-21087-AGCUBDE-2.22a. Provided in Exhibit AGCUB-Bunch13.

1 **Q. Please summarize your recommendations regarding requested waivers of the Billing**
2 **Practice Rules.**

3 **A.** The Commission should not approve any of the requested waivers. The Rules were
4 developed very carefully via inclusive processes and careful review informed by an
5 enormous amount of hard-won experience. There are too many documented risks to
6 customers of other prepay programs to justify waiving important protections, regardless of
7 the purported benefits.

8 None of the Rules are wholly incompatible with prepay programs so if a Prepay program
9 is desired by the Commission, it would be better to bend the Prepay program features than
10 the Rules. The contention that a requirement of the Rules is somehow duplicative or
11 burdensome to administration of Prepay is too low a standard for granting waiver of
12 important rights and protections.

13 Finally, the Company has failed to demonstrate that a more limited set of waivers granted
14 for its Pay As You Go pilot were justified. It would be imprudent of the Commission to
15 grant more-sweeping waivers given the Company's demonstrated indifference and the lack
16 of data or analysis of the earlier waivers.

17 **VII. THE COMPANY HAS NOT DEMONSTRATED THAT ITS PREPAY**
18 **PROPOSAL WILL BE COST-EFFECTIVE**

19 **Q. How might the Company show that Prepay would be a cost-effective program?**

20 **A.** By providing reliable evidence that Prepay would reduce costs for customers.

1 **Q. How would the Company demonstrate that Prepay would reduce costs for Prepay**
2 **customers?**

3 **A.** The simple way to demonstrate that Prepay would reduce cost for Prepay customers would
4 be to charge them a lower rate – exactly what customers in some of the target market
5 segments would expect. The Company, however, is proposing to charge Prepay customers
6 the same rate as post-pay customers. The reasonable presumption, therefore, is that the
7 Company does not believe Prepay will generate a net operating benefit which could be
8 passed on to customers in the form of lower rates.

9 The Company states that it will document and seek recovery of costs in a later rate case.
10 However, it is the Company’s responsibility to demonstrate that Prepay would be cost-
11 effective in the instant proposal, and it has failed to do so.

12 **Q. Will Prepay customers benefit by reducing energy use and costs, regardless of what**
13 **happens with the Company’s operating costs?**

14 **A.** Maybe – but as I described earlier, claimed energy use reductions may have nothing to do
15 with prepay, may result from prepay features just as easily offered to post-pay customers,
16 and may result from customer self-deprivation choices the Commission should not
17 uncritically assume are beneficial.

18 Above, I derived an estimate that Pay As You Go pilot customers used about 3.5% less
19 energy than post-pay customers (6% average energy use reduction on prepay minus 2.5%
20 energy reduction by post-pay customers over the same period). A post-pay customer using

1 6,000 KWh/year (500/month) would therefore use 210 fewer KWh per year after switching
2 to prepay. At \$0.165/KWh, that customer would save about \$34.65 per year.

3 **Q. What costs would Prepay customers incur?**

4 A. Some costs, like many of the benefits, are qualitative and difficult to value, such as the
5 opportunity cost of frequently attending to balance notices from the Company and making
6 payments, and the stresses and logistics of dealing with shutoffs when they happen. There
7 is also the cost of prepaying for electricity, rather than holding onto the money longer and
8 using it for other necessities, or having it work for the customer instead of the Company
9 during that time. The greatest cost to customers, however, is the cost of service lost during
10 disconnections.

11 **Q. How much do disconnections cost prepay customers?**

12 A. Disconnection costs substantially offset any financial benefits the average prepay customer
13 realizes from energy use reductions. Total disconnection cost can be calculated from
14 frequency of disconnections, length of disconnections, and hourly disconnection cost.

15 Based on research performed by Lawrence Berkeley National Laboratory for the
16 Interruption Cost Estimator, CUB derived a cost of \$2 per hour of outage for residential
17 customers.⁶⁰

⁶⁰ See U-20629-024, Citizens Utility Board of Michigan Comments on Service Quality and Reliability Standards for Electric Distribution Systems. Provided as Exhibit AGCUB-Bunch14,

1 Above, I testified that prepay customers of other providers experience frequent shutoffs.
2 Notably, the shutoff warnings sent to DTE’s Pay As You Go customers in the second year
3 of the pilot worked out to more than one per customer per month, though longer-established
4 programs appear to have lower shutoff frequencies. For the sake of argument here, I will
5 assume the average Prepay customer would experience two disconnections per year, a
6 much lower rate than observed in the pilot.

7 Two recent US studies found that “...the average amount of time on prepay without
8 electricity is usually about seven hours or less.”⁶¹

9 Two disconnections per customer per year, multiplied by seven hours each, multiplied by
10 \$2/hour yields disconnection costs of \$28 per customer per year.

11 **Q. How do disconnection costs compare to energy use reduction savings for prepay**
12 **customers?**

13 A. \$34.50 saved per year on energy minus \$28 disconnection cost leaves a net customer gain
14 of only \$6.50, a “gain” that may quickly disappear as this is a rough calculation. I would
15 also reiterate, however, that the energy use reductions may well result from self-deprivation
16 behaviors that reduce the quality of service, comfort, health, and safety of customers – thus
17 the dollar benefit may mask a greater social cost. In addition, customers bear various other
18 costs, described above, that are difficult to monetize.

⁶¹ ACEEE, p. 36, citing DEFG 2014, “Prepay Energy Conservation Impact Study” and Arizona Public Service 2015, “Demand Side Management Residential Prepaid Energy Conservation Pilot Program Report, docket E-01345A-15-0095.

1 **Q. What do you conclude about overall financial benefits for Prepay customers?**

2 A. I conclude that net financial benefits are at best very small and likely come at an
3 unacceptable social cost.

4 **Q. Will the Prepay program save money for other DTE customers?**

5 A. Prepay could reduce costs for other DTE customers if write-offs of uncollectibles owed by
6 Prepay customers were reduced. The Company has not introduced evidence or testimony
7 about the impact on uncollectibles in the instant case.

8 In its Pay As You Go pilot annual reports, however, the Company noted, “There have been
9 no changes in DTE Energy’s uncollectibles resulting from the program.”⁶²

10 **Q. What do you conclude about cost-effectiveness of the Prepay program?**

11 A. The Company has failed to meet the burden of demonstrating that Prepay would be cost-
12 effective. For the most part, the Company has simply failed to introduce evidence or
13 testimony on cost-effectiveness at all. The limited relevant information it has provided is
14 either not persuasive or casts serious doubt on the program’s viability, a conclusion
15 buttressed by data drawn from studies of other programs.

⁶² DTE Prepay Pilot 2015 Final Report, p. 6.

1 **VIII. RECOMMENDATIONS AND CONCLUSIONS**

2 **Q. Please summarize your conclusions and recommendations to the Commission.**

3 A. The Commission should reject DTE's Prepay proposal.

4 The direct benefits to customers are of questionable financial and social value and can
5 largely be achieved without asking customers to waive their rights under the Billing
6 Practice Rules and to pay for electricity in advance.

7 In particular, projected energy use reductions are marginal and fleeting and can be expected
8 largely to result from self-deprivation behaviors rather than reduced energy waste. If the
9 Company believes that providing advance or real-time feedback to customers about energy
10 use and cost can constructively modify their energy use behaviors, then it can achieve those
11 outcomes without employing the coercive mechanism of automatic, short-notice
12 disconnections.

13 The program has not been designed to meet the needs and protect the interests of low-
14 income customers, who both evidence and logic show are the predominant market segment
15 likely to enroll.

16 The waiver of Billing Practice Rules is neither necessary for administration of the program
17 nor justified by the likely benefits to customers. If features of the proposed program are
18 inconsistent with Rules, then the features should change, not the Rules. Waivers would be
19 especially ill-advised for customers whose enrollment in the program would not be
20 meaningfully voluntary.

21 The Company has made no showing that the program would be cost-effective. If it were,
22 the Company should be proposing that Prepay customers pay a lower rate in return for
23 paying for their electricity in advance, as the Company's research shows they expect.

1 **Q. Does that complete your testimony?**

2 A. Yes, but I reserve the right to reply to the testimony of others in rebuttal.

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Executive and organizational innovator with expertise in energy technology, finance, utilities and regulation. Leadership experience in academic, non-profit and public sectors. Broad topical and functional expertise in sustainable and socially responsible business and public policy. Demonstrated ability to recruit top performers and build strong teams.

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- ▶ Integration of clean energy and sustainability into organizational strategy, management and culture through education, training and strategic planning.

PROFESSIONAL EXPERIENCE

5 Lakes Energy, Lansing, MI, *Senior Consultant, May 2019-present*

Michigan Municipal Association for Utility Issues, Ann Arbor, MI

Founder and Managing Director, 2017-present

Providing collective, expert and focused representation for municipal governments in Michigan Public Service Commission proceedings and in dialog with regulated utilities.

Southeast Michigan Regional Energy Office, Ann Arbor, MI

Executive Director, 2014-2017

Directed coalition of southeast Michigan municipalities cooperating to identify, finance and implement clean energy projects.

University of Michigan, Erb Institute for Global Sustainable Enterprise

Managing Director, 2008-2013

Led world-leading sustainable enterprise program at top-10 business school.

Aspen Institute Business and Society Program, New York

Senior Fellow, 2006-2008

Launched new Corporate Social Responsibility business education program in China in partnership with Chinese business schools, accrediting agency and corporations

Bainbridge Graduate Institute, Bainbridge Island, WA

Executive Director, 2003-2005

Led administration, education, fundraising and communications of fast-growing, startup business school with world-first infusion of sustainability throughout MBA curriculum.

World Resources Institute, Washington, DC

Director of Business Education, 1996-2003

Developed, fundraised and directed international sustainable business education initiatives engaging universities, companies, governments and non-profit leaders.

Washington Public Interest Research Group, Seattle, Washington

Executive Director, 1989-1992

EDUCATION

MBA with Environmental Management Certificate, University of Washington, 1995

BA in Political Science, Yale University, 1985

TRAINING

EUCI Outdoor Street Lighting Conference, June 4-5, 2019, Atlanta.
EUCI Electric Cost-of-Service – Essential Concepts for a Changing Industry Course, July 15-1, 2019, Chicago.
MSU-IPU Accounting and Ratemaking course, September 2020
EUCI Utility Green Tariffs: A to Z course, November 4-5, 2020, online
MSU-IPU Advanced Regulatory Accounting and Auditing course, October 2021
NRRI Regulatory Training Institute, Regulating Public Utility Performance course, current

REGULATORY PROCEEDINGS

Expert witness, MPSC case U-20963 (Consumers Energy electric rate case), municipal street lighting tariffs, 2021.
Expert witness, MPSC case U-20697 (Consumers Energy electric rate case), municipal street lighting tariffs, 2020.
Expert witness, MPSC case U-20530, I&M PSCR reconciliation
Expert witness, MPSC case U-20561 (DTE Electric general rate case), production allocation, 2019
Expert witness, Kentucky Public Utilities Commission cases 2020-349 and 2020-350, the combined Kentucky Utilities and Louisville Gas & Electric electric and gas rate cases.
Submitted comments, MPSC case U-20147, Electric Distribution Planning. Participated in stakeholder meetings.
Submitted comments, MPSC case U-20629, electric reliability standards. Focused on municipal street lighting reliability standards.
MPSC case U-20134 (Consumers Energy general electric rate case), organized and managed coalition of municipalities intervening to challenge street lighting tariffs.
MPSC cases U-18014 and U-17767, DTE Electric general rate cases, organized and coalition of municipalities challenging street lighting tariffs.

SELECTED RESEARCH AND PUBLICATIONS

“Corporate Responsibility In a Transitioning Industry: An Automotive Supply Chain Perspective”, Automotive Industry Action Group, 2019. Co-author and researcher.
“Expect the Unexpected: Building Business Value in a Changing World”, KMPG 2012. Erb Institute (University of Michigan) research team leader and contributor.
Where Will They Lead? China 2008 MBA Student Attitudes about Business & Society. The Aspen Institute, 2008.
“Beyond Grey Pinstripes: Preparing MBAs for Social and Environmental Stewardship,” World Resources Institute and The Aspen Institute, 1998, 1999, 2001 and 2003. Creator, co-author. Numerous academic, non-profit and public agency conference and meeting presentations and public testimony.

SERVICE

Michigan Environmental Council Board of Directors, 2009-present. Treasurer, 2017-present. Lansing, MI.
Soulardarity Board of Directors and Secretary, 2018-present. Highland Park, MI.
Washington Public Interest Research Group Board of Directors, 1994-present
WashPIRG Foundation Board of Directors, 1994-present. Seattle, WA.
PIRGIM Education Foundation Board of Directors, 2015-present. Ann Arbor, MI.

Examining Potential for Prepay as an Energy Efficiency Program in Minnesota

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Abstract

This report is designed to investigate the potential for prepaid electricity plans to operate as energy efficiency within Minnesota's conservation improvement programs. Like prepaid cell phone customers, prepaid electricity customers pay for service in advance of receiving it. When customers' prepaid credit runs out, their electricity is remotely turned off at the next legally permissible time (usually following a short grace period and low-balance warning, often not during specific times like extremely hot or cold days). This differs from the current standard payment plan in many respects and remains controversial among key stakeholders.

We conducted a literature review, program evaluation analysis, stakeholder interviews, and a simulation of potential Minnesota-specific scenarios.

Customers on prepaid electricity plans likely use less electricity than they would otherwise. On average, the estimated electricity usage reduction is approximately 9%, with six evaluations suggesting savings under 7%, one (a small sample study) finding nonsignificant reductions, and five suggesting reductions of more than 10%. This suggests that prepay programs influence energy use, but more research is necessary to determine the degree of influence and to rule out alternative explanations. In particular, many of the evaluations included savings from residential power being shut off,¹ and most evaluations could not adequately control for self-selection bias. More research is needed regarding the actions that households take to reduce consumption and whether or not those actions lead to deprivation.

Mindful of these caveats, we estimate that Minnesota prepay participants could reduce their consumption by 8.5% in a standard prepay program, or 2% in a program that includes a key consumer protection: removal of automatic shutoffs. These are fragile estimates. Research to date includes only programs with automatic shutoff and does not address whether elements that are not unique to prepay, such as enhanced motivating feedback, are responsible for most of the savings. Therefore this report offers a framework for interested utilities to design a prepay pilot program that can answer these important questions while addressing consumer protection concerns.

¹ Some stakeholders argue that energy reductions from disconnection should be included as savings because disconnections could be used as a deliberate action to control usage. We do not agree. Evidence is insufficient to state that most customer disconnections occur deliberately, without affecting quality of life. Customers using prepay could deliberately self-disconnect without experiencing deprivation, for example while traveling, but in current evaluations, this type of disconnection has not been accounted for separately from other disconnections. Based on our research, we tentatively conclude that most self-disconnection occurs while customers are at home and represents some degree of deprivation as opposed to efficiency behavior (conservation). More research on this question could change this conclusion.

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Definition of Terms and Acronyms

AMI: Advanced metering infrastructure

Arrears: Money that is owed and should have been paid earlier

CIP: Conservation improvement program

Conservation: The act of reducing energy consumption without reducing quality of life

Deprivation: A reduction in quality of life

DEFG: Distributed energy financial group

Energy efficiency investment: The act of reducing energy consumption by purchasing physical devices or home upgrades

Energy efficiency behaviors: An umbrella term referring to both conservation and energy efficiency investment

GWh: Gigawatt hours

IOU: Investor-owned utility

kWh: Kilowatt hours

LIHEAP: Low-income home energy assistance program

NCLC: National consumer law center

Quality of life: A combination of a person's subjective and objective life circumstances, including both subjective measures of well-being and satisfaction and objective measures of health, costs of living (relative to income), and other factors.²

² Authors such as Diener and Suh (1997) cite these measures as potentially useful for measuring quality of life. We recognize the ongoing debate among health researchers regarding this term.

Executive Summary

Overview

Prepay electricity plans require customers to pay for their electricity in advance of receiving service. These plans reconceptualize the electricity provision system and turn it from a service paid for after the fact to a service paid for in advance. This program model is controversial because low-income customers represent a sizable proportion of participants in such programs, and consumer advocates have raised concerns regarding potential negative effects on this vulnerable population. Nevertheless, prepay advocates suggest that these programs could reduce electric consumption while increasing utility revenues and customer satisfaction. To determine the potential in implementing prepaid electricity plans as energy efficiency programs in Minnesota, we set out to answer eight research questions:

1. What is the history and prevalence of prepaid electricity programs?
2. Why is prepay implemented?
3. What are the potential usage reduction impacts of prepaid electricity?
4. What might be the usage reduction potential from prepaid programs in Minnesota?
5. What are the considerations of prepay advocates and opponents regarding prepay programs?
6. Which elements of prepay cause the reduction in energy use?
7. Is the reduction in consumption a result of energy efficiency behavior (i.e., conservation), home upgrades, or deprivation?
8. What is a recommended framework for establishing a prepaid electricity program in Minnesota?

Background

Prepay electricity plans allowing multiple payment options have existed since the 1980s and are prevalent in many areas of the world. In Minnesota, only one utility (an electric cooperative) currently offers a prepaid electricity option. Another Minnesota utility previously offered a prepay plan option that they have since discontinued due to concerns from consumer advocates and regulators. A third utility recently filed to include a new pilot program in their energy efficiency portfolio, but the program was rejected by the Department of Commerce.

Prepay electricity plans typically differ from traditional postpay plans in several ways: payment arrangements, energy consumption feedback, disconnection, and overall costs. A number of these features could, in themselves, reduce energy consumption and may be applied to current postpaid plans. Others could be eliminated from prepaid plans to increase consumer protections, but the energy savings impacts of doing so are yet unknown.

Methods

We conducted this study in five steps: a literature review, a summary and assessment of program evaluations, interviews with stakeholders and experts, calculation of potential Minnesota energy

savings, and framework development for utilities to create prepaid electricity pilot programs that address consumer protection issues and answer key research questions.

Results

Customers on prepaid electricity plans likely use less electricity than they would otherwise. On average, the estimated electricity usage reduction is approximately 9%, with six evaluations suggesting savings under 7%, one (a small sample study) finding nonsignificant reductions, and five suggesting reductions of more than 10%. This suggests that prepay programs influence energy use, but more research is necessary to determine the degree of influence and to rule out alternative explanations. In particular, many of the evaluations included savings from power being shut off, and most could not adequately control for self-selection bias.³ More research is needed regarding the actions that households take to reduce consumption and whether those actions lead to deprivation. One report examined the persistence of savings and noted that energy reductions from prepay continued during the programs but also diminished over time.

Stakeholders and experts we interviewed raised a variety of concerns regarding prepaid electricity. These included a need for additional research to address unanswered questions, customer and consumer protection issues (especially for low-income customers), and uncertainty about utility costs and savings. Of these, possible consumer deprivation resulting from more frequent shutoffs was the most commonly cited issue. However, prepay advocates note that current postpay plans are also imperfect. They allow customers to accrue arrearages, and if shut off, the power outage is longer and more difficult to remedy. Nevertheless this report examines prepaid electricity specifically and whether it can reduce electricity use without causing deprivation. Stakeholders generally agreed that more research was required on this and other consequential topics. The state regulatory decisions outside Minnesota that we reviewed revealed a common concern by regulators regarding consumer protections.

A significant issue of whether prepaid electricity plans should be considered energy efficiency programs also remains. Most existing prepay plans we reviewed were proposed as programs to provide customer bill payment alternatives, not as energy efficiency programs. Importantly, based on the Minnesota definition of energy efficiency, a prepay electricity program would not be considered efficiency if it reduces “the quality or level of service provided to the energy consumer.”⁴

Prepay customers sometimes pay more for electricity than postpay customers and tend to go without electricity more often. However, in surveys by prepay program administrators and university

³ Some stakeholders argue that energy reductions from disconnection should be included as savings because disconnections could be used as a deliberate action to control usage. We do not agree. Customers using prepay could potentially deliberately self-disconnect without experiencing deprivation, for example while traveling, but in current evaluations, this type of disconnection has not been separated from other disconnections. Based on our research, we tentatively conclude that most so-called self-disconnection occurs while customers are at home and, as such, represents some degree of deprivation. More research on this question could overturn our conclusion.

⁴ We have been informed that some utilities are considering packaging structural energy efficiency measures with prepaid electricity plans but, as yet, do not have details of these plans.

researchers, most prepay customers reported being satisfied with their plans (and sometimes preferred them to postpay). Minnesota regulators or legislators will have to decide whether these programs cause consumer deprivation and/or a reduction in quality of service to determine whether they may qualify as energy efficiency measures.

Leaving aside the issue of whether usage reduction is energy efficiency, we estimated the total potential electricity usage reduction impact of prepaid electricity in Minnesota. To accomplish this, we developed two scenarios, one in which the program follows current norms (including automatic disconnect shortly following a zero balance) and the other with no disconnection threat (i.e., customers move back to a traditional payment plan when their balance is zero or have some other incentive for avoiding a \$0 balance). Programs without disconnection have been proposed but, as yet, have not been piloted. We present annual energy savings estimates and assumptions for each scenario in Table 1.

While these estimates represent our best judgement of relevant data and how they may apply to the Minnesota landscape, we emphasize that they are based on a limited data set that often includes a large proportion of low-income and payment-challenged customers. In addition, more research is needed to estimate savings potential under different scenarios (e.g., to understand potential energy reductions if the program design had no disconnection threat). In the second scenario, with no threat of disconnection, we hypothesize that through high levels of customer feedback and engagement, we would still see energy reduction as compared to traditional postpay plans (but less than from standard prepay plans). This is an area where further research would strengthen the accuracy of the estimates in Table 1.

Table 1. Annual energy savings estimates and assumptions

| Scenario | Baseline residential energy consumption (GWh) | Annual usage reduction | Total potential statewide usage reduction (GWh)⁵ |
|---|--|-------------------------------|--|
| Customers can be disconnected after payment lapse | 10,627 | 8.5% | 9 GWh |
| Customers will not be disconnected after payment lapses but will be moved to traditional payment plan | 10,627 | 2% | 2.1 GWh |

⁵ This assumes a 1% participation rate. See the Estimating Impacts section of the report for details.

Recommendations

We offer a framework to utilities interested in designing prepaid electricity pilot programs that would help fill the knowledge gap while addressing consumer protection concerns.

Programs that fully address potential consumer deprivation may reduce potential energy savings (e.g., by eliminating threat of remote shutoffs). Consumers (especially low-income customers) will be better protected, but electricity savings may decrease or become nonsignificant. Our recommended pilot program design framework specifically addresses this possibility. We recommend using several alternative treatment groups (in addition to standard postpay control groups), quasi-experimental methods, and creative sampling strategies.

Conclusions

Previous evaluations suggest that electricity consumers use less electricity when on a prepaid electricity plan. However, this observed usage reduction may in part be due to factors that reduce customer quality of life, such as going without electricity more often. We do not argue that customers on prepay necessarily experience more deprivation than those on postpay plans. Those on postpay plans that accumulate large arrearages and experience extended disconnections may have equal or diminished quality of life and greater deprivation than those on prepay. Rather we note that one factor that may strongly motivate behavior change (threat of fast disconnection) may also reduce quality of life and, thus, may be integral to the program's electricity reductions. Therefore more research on the cause of electricity reductions in prepay programs is necessary.

We also note that further research may highlight elements of prepaid electricity plans that are not unique and may account for a substantial proportion of the energy savings. In particular, advanced real-time feedback about electricity use, along with metrics and messages that motivate behavior change, could be one such key factor.

Introduction

The state of Minnesota's Next Generation Energy Act (2007) established the importance of cost-effective energy reduction.⁶ The act focused on energy conservation as the primary strategy for meeting this goal and established an energy use savings target of 1.5% (electricity and natural gas) each year through cost-effective conservation improvement programs. The Minnesota Department of Commerce, Division of Energy Resources sponsored this white paper to examine the viability of prepaid electricity services as a potential energy efficiency program that could help conservation improvement programs reach their annual savings targets.

To examine potential program savings, we addressed whether customers using prepaid electricity reduce their electricity consumption and, if so, whether this reduction can be considered energy efficiency.⁷ To do this, we examined the potential of prepay programs to change behavior, attempted to determine which behaviors might be changed, and assessed which elements of the program might cause that change.

The question of whether prepaid electricity payment plans should be considered energy efficiency programs hinges on more than whether the programs reduce consumption.⁸ Minnesota's statutory definition of energy efficiency requires that the measures or programs save energy "without a reduction in the quality or level of service provided to the energy consumer." Consumer behaviors that are changed, the subjective experience of the participants, and the objective outcomes for those participants dictate whether the program causes energy savings through energy efficiency behaviors (i.e., conservation or energy efficiency investment) or deprivation (see Glossary for definition of these terms). Minnesota should not consider a program that causes deprivation to be an energy efficiency program. In the section Prepay Considerations from Opponents and Advocates, we examine the research on the deprivation question and suggest future research avenues.

A small number of states and utilities recently proposed prepaid electricity as an energy efficiency measure. Because of the limited implementation to date, empirical evaluations of prepay's effectiveness to reduce energy consumption are few. We therefore combined our review of program evaluations, academic literature, regulatory decisions, and other non-peer-reviewed reports with interviews of key actors and stakeholders who are familiar and/or involved with prepay electricity programs. With this complete picture of programs, literature, and interviews, we were able to distill the current state of

⁶ The details of the Next Generation Energy Act can be found on the Minnesota government [website](#).

⁷ Minnesota defines energy efficiency as follows: *Energy efficiency* means measures or programs, including energy conservation measures or programs, that target consumer behavior, equipment, processes, or devices designed to produce either an absolute decrease in consumption of electric energy or natural gas or a decrease in consumption of electric energy or natural gas on a per unit of production basis without a reduction in the quality or level of service provided to the energy consumer. The full definition can be found on the government [website](#).

⁸ We use the term *prepay plan* to indicate a payment option and *program* to indicate a strategy to change behavior, such as an energy efficiency program. Minnesota regulators and legislators may wish to decide whether prepay plans should be considered conservation improvement programs.

knowledge and identify ideas for future pilot programs and empirical research on prepay as energy efficiency.

Importantly, this report takes examples from national and international programs and combines them with Minnesota-specific interests, cultures, and requirements. We propose Minnesota-specific recommendations and estimate potential savings for Minnesota prepaid electricity programs using assumptions derived from our research.

Key Research Questions

This research report serves to answer key questions to help Minnesota decide whether the state should incorporate prepaid electricity plans into the Minnesota Conservation Improvement Program (CIP):

1. What are the history and prevalence of prepaid electricity programs?
2. Why is prepay implemented?
3. What are the potential usage reduction impacts of prepaid electricity?
4. What is the usage reduction potential from Minnesota prepaid programs?
5. What are the considerations of prepay advocates and opponents regarding prepay programs?
6. Which elements of prepay cause reduction in energy use?
7. Is the reduction in consumption a result of energy efficiency or deprivation?
8. What is a recommended framework for a prepaid electricity program in Minnesota?

This report provides answers to these questions using previously gathered reports and studies, along with interviews with key stakeholders. In some areas, our analysis and recommendations are limited due to a lack of strong research and pilot program evaluations.

Structure of this Report

This report begins with a basic description and background of prepaid electricity plans (highlighting Minnesota context) and then continues with four primary sections. The first section, Prepaid Electricity Impact on Energy Use (along with [Appendix E](#)), is an analysis of currently available evaluations of energy reductions from prepaid programs. In this section, we also delve briefly into what elements of the prepay plans may cause changes in behavior (with more details provided in [Appendix B](#)). The second section, Prepay Considerations from Opponents and Advocates, discusses why utilities usually offer prepay plans, why some stakeholders may be concerned, and what regulatory bodies have decided regarding prepay proposals. The third section, Potential Energy Efficiency Impacts of Prepay in Minnesota, is a calculation of potential energy reductions from prepaid programs in Minnesota. The last section, Recommendations, provides a framework for utilities interested in implementing a prepaid pilot program.

Prepaid Electricity: Background

Prepay electricity plans, like prepay cellphone plans, require customers to pay in advance of receiving service. When customers' prepaid credit runs out, their electricity is remotely turned off at the next legally permissible time (usually following a short grace period and low-balance warning, often not during specific times like extremely hot or cold days). Conversely, electricity is immediately restored when the customer purchases additional credit. This differs from the current standard payment plan in many respects. Although customers purchase other necessities in advance of use, such as groceries or gasoline, using this system for electricity remains controversial.

Although plans vary, prepay electricity plans typically differ from postpaid plans in several characteristics. The differences that may be relevant for affecting behavior are summarized in Table 2.

Table 2. Comparison of prepaid electricity plans and postpaid plans

| Characteristic | Prepaid plan | Postpaid plan |
|--------------------------------|---|--|
| Payment arrangements | Customers pay for their electricity before using it. Newer programs allow paying for credit using a variety of payment systems. | Customers typically pay for their electricity <i>after</i> using it, usually with a delay of about three weeks to two months. Paying in advance rarely occurs. Most programs allow for payment using a variety of payment systems. |
| Feedback on energy consumption | Customers receive frequent feedback about their electricity use. | Customers typically receive feedback infrequently, usually in monthly bills (which may be ignored if a customer subscribes to autopay). Sometimes customers also receive home energy reports from a third party. This varies depending on the utility. |
| Rapid disconnection | Customers are remotely shut off from electricity services shortly after running out of credit. This usually follows a short grace period, and often not during restricted times that mirror restrictions for postpay (e.g., extreme weather days). ⁹ | If customers do not pay their bills, they can accumulate arrears for a longer period before being shut off. Customers receive multiple written warnings and often cannot be disconnected during restricted times (e.g., extreme weather days or extended heating/cooling seasons). |

⁹ As with postpay plans, if power was disconnected before these times, it will not be reconnected during these events. To our knowledge, two programs have proposed returning customers to postpay after a grace period of a few days, rather than disconnecting them. However they have not been approved by regulators.

| Characteristic | Prepaid plan | Postpaid plan |
|--|--|--|
| Costs and deposits for initiating services | These vary among plans. Sometimes prepay plans offer lower fees (or no fees) for connection or reconnection of electricity services, relative to postpay. Sometimes prepay plans require no deposit (or reduced deposit) for initiating service. | Postpay plans often require a deposit or credit card before service can be initiated. |
| Rate structure and overall costs | Prepay plans generally have different rates and fees than postpay plans. Sometimes various fees are waived. In other cases, programs add equipment rental fees, access charges, transaction fees (e.g., for credit card payments), or mandatory repayment of existing arrearages. Sometimes, prepay customers can receive the same access to time-of-use rates as postpay customers. American prepay kWh rates are not usually lower than postpay rates. | Postpay plans often have tiered or time-of-use rate designs that are different from prepay. In the United States, overall costs are usually the same or lower than prepay, but they are somewhat comparable. When utilities charge transaction fees for certain payment methods, customers using those methods who are paying only once per month will have lower overall costs than those paying more frequently. |

History and Prevalence of Prepaid Electricity

United Kingdom utilities are credited with the earliest versions of prepaid electricity plans, using coin-operated electricity systems in the early 1900s. In 1988, South Africa’s Eskom public utility operated the first prepaid electricity plan that allowed more payment options. That plan, and others that followed, used cards, keys, or key codes that could be recharged at a kiosk or over the phone (Esteves et al. 2016). Following the South Africa program, utilities rolled out prepaid electricity plans throughout other regions of Africa, Europe, South America, Asia, and more recently, North America.

In this way, prepaid electricity plans became a common electricity payment method in many countries. In Mozambique, 80% of customers in 2011 used prepay meters (Esteves et al. 2016). In South Africa, approximately 4.3 million electricity customers use prepay.¹⁰ In China, an estimated 34% of customers across all provinces and urban/rural districts use prepay (Du, Guo, and Wei 2017). New Zealand, India, and Argentina are also leading countries in terms of prepaid usage (Oseni 2015). In all these cases, prepay electricity began as pilot projects that grew slowly over 10 to 20 years into established programs that are now widely accepted as a common form of electricity payment.

Prepay is also a prevalent form of bill payment in many European countries. In the United Kingdom, 16% of electricity consumers subscribed to a prepaid program in the first quarter of 2018, including 38% of

¹⁰ Eskom data on its prepay customers in South Africa are available on the [Eskom website](#).

customers in Northern Ireland (Ofgem 2018). These regions have prepay consumers from all income brackets (Oseni 2015).

Prepay electricity programs in the United States have grown in number over the past decade. The Distributed Energy Financial Group (DEFG), a management consulting firm that focuses on energy and has promoted prepay electricity, maintains a database of prepaid programs across the country. In 2018, the DEFG database included 17 prepaid electric utility programs with the status “pilot” or “full scale,” 12 programs with the status “planning,” three with “canceled” or “suspended,” and seven that are unknown (and not public), for a total of 40 programs (N. Treadway, Managing Partner, DEFG, pers. comm., July 12, 2018). Most of these programs launched after 2009, while one launched in 1998.

North American programs rely on advanced metering infrastructure (AMI)—also known as smart meters—which is more powerful and flexible than earlier keypad, card, or key code prepay systems. AMI allows utilities to track customer use and provide real-time feedback over multiple personal devices. Other technological advances also allow customers to add account credit online or via other methods.

Around the world, low-income customers are enrolled in prepaid plans more frequently than customers in other income brackets (e.g., Boardman and Fawcett 2002; Brutscher 2012; Darby 2010; Graham and Marvin 1994; Howat and McLaughlin 2012). Although other demographics may be a potential future market for prepay in North America (e.g., tech-savvy millennials; Wimberly 2018), this is currently also true in the United States. Among programs that have disclosed customers’ income information, low-income consumers usually compose the largest group of enrolled customers in prepaid plans (e.g., APS 2015; Doble 2010).¹¹ In some regions, such as the Netherlands, Ghana, and some areas of the United States, utilities market prepay to all income levels, but low-income customers are nevertheless the primary participants (Azila-Gbettor, Atatsi, and Deynu 2015; Esteves et al. 2016; APS 2015). Therefore when considering whether prepaid electricity plans are behavior-change programs, implementers should pay attention to impacts on this customer class in particular.

Prepay Programs in Minnesota

Minnesota Valley Electric Cooperative (MVEC) is the only Minnesota utility that currently offers customers an option to prepay their bills. Their program, called “PayGo,” allows customers to pay smaller daily and weekly increments. Customers also have an option to add account funds to cover their electric needs for months in advance. According to MVEC, approximately 400 of around 40,000 members (i.e., customers) are part of this program. The utility’s website reports that nearly all (95%) the 400 MVEC members in the PayGo program said it allows them to fit their electric bill more easily into their monthly budget. In addition, when asked about their energy usage, 59% of MVEC PayGo members said their electric costs were noticeably lower. However this value was self-reported and these findings have not been independently evaluated to demonstrate energy savings. MVEC offers the PayGo payment option to a small number of customers as an alternate arrangement to monthly billed

¹¹ Most utilities in the United States with prepay programs have small programs and either do not collect or do not share data on the income levels of their participants. Nevertheless, based on available data and interviews with prepay experts, it is reasonable to believe the United States is similar to other countries in that prepay customers are more likely than non-prepay customers to be low income.

payments. It is not intended to be an energy efficiency program. Program participants can be disconnected from service if they do not make their payments. However, to prevent surprise, MVEC provides notifications when the account balance is nearing zero (E. Webster, Vice President Corporate Services, MVEC, pers. comm., August 20, 2018).

Nearly 25 years ago, Ottertail Power, an investor-owned utility (IOU) that provides electricity service in Minnesota, had a pilot program for their employees that included a prepayment option. These participants had an in-home device that would take credit card payments. While some customers liked the option, consumer advocates and regulators had concerns, and so the program was discontinued (J. Grenier, Market Planning Manager, Ottertail Power, pers. comm., June 14, 2018).

Recently, MN Power, another IOU in the state, submitted a request to include a prepay pilot in their 2017–2019 Triennial CIP filing. The pilot was described briefly in the filing, including their work with ESource to develop the pilot. However, the Minnesota Department of Commerce ultimately rejected this pilot program because it did not contain enough detail about program design and consumer protection elements (J. Burdette, State Energy Officer, Minnesota Department of Commerce, pers. comm., July 2, 2018).

Methods

We conducted the research and writing of this report in five steps:

1. Conducted a thorough literature review of 30 peer-reviewed academic articles, eight regulatory decisions, and 24 non-peer reviewed reports (from utilities, advocates, consumer rights organizations, and news media organizations)
 - 1) Located, assessed, and summarized 16 prepaid electricity program evaluations, which were described in 10 reports
2. Conducted interviews with 21 different stakeholder groups, including five Minnesota utilities, two prepay implementation companies, six consumer advocate organizations, three organizations that advocate prepay (among other issues), two Minnesota government offices, and three academic researchers working at various universities, summarized the themes from the interviews in [Appendix A](#), and integrated those themes into the report, alongside the literature review, where appropriate
 - 2) Established scenarios for prepaid programs in Minnesota and calculated potential savings from those scenarios
3. Produced framework recommendations, noting where the knowledge gaps resided and how pilot programs could be designed to address these knowledge gaps and provide service that protects consumers

Prepay Electricity Impact on Energy Use

In our search for high-quality electricity consumption evaluations for prepay programs, we found 10 reports containing results from 16 evaluation efforts of varying rigor. Table 3 summarizes information about these program evaluations and [Appendix E](#) provides more-detailed explanations (with references). To assess each study and/or evaluation, we sought information on

- The percentage change in electricity use and whether the change was statistically significant
- The evaluation method and what type of control group was used (if any)
- The number of participants
- The length of time participants' energy use was observed before and after enrolling in a prepaid plan
- What participant actions appear to account for reduced electricity consumption
- Whether the savings evaluations excluded time during which customers' power was turned off¹²
- Whether total electricity costs to prepaid program customers were different from those in the postpay control groups¹³
- The year the evaluation was conducted
- The region where the programs were implemented

The reports in Table 3 include statistics and research methods that were used in the evaluated programs. However these varied significantly in their levels of transparency and quality. We rated the quality of evaluations as “acceptable” or “limited.” Acceptable evaluations included most of the data we were looking for. Limited evaluations were difficult to assess because they lacked transparency or information (e.g., we were not provided full evaluation reports, but short summaries of the evaluations). More details regarding the evaluation classifications is available in [Appendix E](#), along with specific findings from those evaluations.

¹² Customers turn off electricity service more frequently when enrolled in prepay than when enrolled in postpay (Howat and McLaughlin 2012). Therefore evaluators should calculate how much of the electricity savings (if any) can be attributed to power being completely turned off. To our knowledge, no evaluation has attempted to differentiate between power being off while residents are at home as opposed to away (when it would be less likely to affect quality of life).

¹³ In some cases, consumers prepaying for electricity may pay higher electricity costs (rates, transaction fees, enrollment costs, reconnection fees, and so on) than comparison consumers (e.g., Martin 2014). Although consumer price sensitivity is typically low, this could nonetheless be one part of the reason that prepay customers reduce their electricity consumption. Higher costs could take the form of monthly access fees or reconnection fees, but they could also take the form of third-party vendor fees (e.g., charged at a kiosk or for payment by check) that may be incurred more frequently by prepay consumers because they pay for electricity more often. Many programs also include a debt-repayment component in which a portion of top-up credits that are purchased (sometimes as much as 40%) first go to paying down previously incurred debt. Debt repayment while receiving service is a benefit of prepay that some customers appreciate; however it could also reduce the available income for customers to purchase electricity. Thus a debt repayment requirement could be a factor that influences consumption.

Table 3. Prepay electricity evaluations and findings

| Program | Scope of evaluation | Prepay program duration | Electricity savings | Number of prepay participants | Number in control group | Savings control for disconnect | Costs, compared to postpay ¹⁴ | Evaluation design | Reference |
|---|---------------------|-------------------------|-------------------------------|-------------------------------|-------------------------|--------------------------------|--|--|------------------------------|
| Eskom, Cape Town, South Africa | Acceptable | ~16 months | 13% | 4,246 | No control group | No | Similar | Pre-post, control for selection bias ¹⁵ | Jack and Smith (2016) |
| Salt River Project (SRP) 2008–2009, Arizona | Acceptable | 1 year | 12% | 1,641 | 1,641 | No | Higher | Matched control group, pre-post | Qiu, Xing, and Wang (2016) |
| Arizona Public Service, Arizona | Acceptable | ~1 year | 7.50% | 86 | 86 | Yes | Higher | Matched control group, pre-post | APS (2015) |
| Direct Energy, Texas | Acceptable | 3 years | 9.60% | Unclear | Unclear | Yes | Similar | Non-matched controls, instrumental variable approach | Eryilmaz and Gafford (2018) |
| Duke Energy, North and South Carolina | Acceptable | 2 years | Not statistically significant | 74 | 74 | No | Higher | Matched control group, post only | Duke Energy Carolinas (2017) |
| Glacier Electric | Acceptable | < 1 year | 14% | 1,240 | No control group | Yes* | Not available | No control group, pre-post | DEFG (2014) |

¹⁴ For details regarding this variable, see [Appendix E](#).

¹⁵ This evaluation controlled for selection bias by including only participants who were involuntarily switched to a prepay plan. The researchers observed 27 separate groups that switched from postpay to prepay, and randomly determined when each switch would occur.

| Program | Scope of evaluation | Prepay program duration | Electricity savings | Number of prepay participants | Number in control group | Savings control for disconnect | Costs, compared to postpay ¹⁴ | Evaluation design | Reference |
|---|---------------------|-------------------------|---------------------|-------------------------------|-------------------------|--------------------------------|--|----------------------------------|---------------|
| Cooperative, Montana | | | | | | | | | |
| Kentucky Association of Electric Cooperatives | Acceptable | ~1 year | 11.10% | 574 | No control group | No | Higher | No control group, pre-post | Martin (2014) |
| Oklahoma Electric Cooperative | Acceptable | ~22 months | 10.40% | 1,217 | No control group | Yes* | Higher | No control group, pre-post | Ozog (2013) |
| Pacific Northwest PenLight, Washington | Limited | ~1 year | 5.50% | 154 | No control group | Yes* | Not available | No control group, pre-post | DEFG (2014) |
| Salt River Project 2003–2006, Arizona | Limited | 1 year | 12% | 463 | 463 | No | Higher | Matched control group, pre-post | EPRI (2010) |
| TVA 1, Tennessee ¹⁶ | Limited | ~1 year | 5.60% | 350 | Unclear | No | Unclear | Matched control group, only post | DNV GL (2016) |
| TVA 2, Tennessee | Limited | ~1 year | 6.70% | 184 | Unclear | No | Unclear | Matched control group, only post | DNV GL (2016) |
| TVA 3, Tennessee | Limited | ~1 year | 5.00% | 201 | Unclear | No | Unclear | Matched control group, only post | DNV GL (2016) |

¹⁶ Six implementations of prepay by utilities in the Tennessee Valley Authority (TVA) were separately evaluated within one report. The utilities chose to remain anonymous.

| Program | Scope of evaluation | Prepay program duration | Electricity savings | Number of prepay participants | Number in control group | Savings control for disconnect | Costs, compared to postpay ¹⁴ | Evaluation design | Reference |
|------------------|---------------------|-------------------------|---------------------|-------------------------------|-------------------------|--------------------------------|--|----------------------------------|---------------|
| TVA 4, Tennessee | Limited | ~1 year | 6.90% | 183 | Unclear | No | Unclear | Matched control group, only post | DNV GL (2016) |
| TVA 5, Tennessee | Limited | ~1 year | 11.70% | 145 | Unclear | No | Unclear | Matched control group, only post | DNV GL (2016) |
| TVA 6, Tennessee | Limited | ~1 year | 6.80% | 76 | Unclear | No | Unclear | Matched control group, only post | DNV GL (2016) |

*The author controlled for the effects of disconnection in the regression analysis but used a procedure that could be debated. See [Appendix E](#) for details.

Overall we found 16 individually evaluated programs within 10 reports. Most of the evaluations contained enough information to assess, but eight of these program evaluations were difficult to assess because they provided little information on which we could draw conclusions. Most evaluations had sample sizes below 600 (eight of 16 had fewer than 201 participants) in the prepay intervention group (four had over 1,000), and the duration of data collection from most customers while on prepay was approximately one year (four were longer, one was shorter). Most studies used a pre-post evaluation method or included a matched control group. Therefore many evaluations could be somewhat influenced by a potential self-selection bias and contained somewhat small sample sizes.

The program evaluations listed in Table 3 show that customers who prepay for electricity likely use less electricity than they would otherwise. On average, the estimated energy reductions are approximately 9%, with seven evaluations suggesting reductions under 7% (plus one study that reported only statistically nonsignificant reductions) and five evaluations suggesting reductions of more than 10%. However, the programs cannot be directly compared to one another because they include different elements (e.g., fees, rates, and payment options) and evaluation methods (e.g., control groups and calculation of savings). Many evaluations do not report one or more critical pieces of information (e.g., whether debt repayment is automatically deducted from top-up payments, total costs to consumers, and the size of the control group). Only one evaluation (Kentucky) examined the potential persistence of energy reductions over time, and the author of that report noted that these reductions generally persisted during the program but also diminished over time. This finding concurred with the TVA evaluations, whose authors tentatively concluded that savings were highest for new programs and lower for more mature programs.

We compared customer costs between prepaid and postpaid programs. While it was rare to see a different electricity (kWh) rate between the two payment plans, it was common (in the programs in Table 3) to see additional fees that could make overall prepay costs higher. For some programs, these fees included monthly access charges, third-party vendor fees (such as kiosk or bank fees), or reconnection fees. It was difficult to calculate exact costs to customers because program evaluations did not provide in-depth examination of these details. However, we suspect at least two programs (Texas and South Africa) had negligible differences in costs for customers between prepay and postpay plans.¹⁷

The South Africa program was one with similar costs (except for some participants who were switched from a lifeline electricity fee when moved to prepay), and it demonstrated an estimated 13% savings. Although the methodology for this program's evaluation was stronger than any other in our review (reducing self-selection bias by only examining involuntary switching to prepay), the context and program type were qualitatively different from those offered in the United States. That evaluation did not exclude savings from customer disconnections, and it was applied in poor regions of South Africa. A Texas prepay program was also likely to have similar costs between prepay and postpay (although exact rates were not disclosed) along with an estimated 9.6% savings. However this evaluation included a nonmatched control group with an unverified number of participants. For the remaining 14 evaluations, six reported likely higher costs (due to fees, transactions costs, and so on) and eight did not provide

¹⁷ See [Appendix D](#) for a discussion of costs in each program.

information. Although consumers are not extremely price sensitive, the possible cost difference could help explain some of the reductions in consumption, especially among budget-constrained customers.

Five evaluations excluded savings resulting from customer shutoffs. These programs took place in Arizona APS (7.5% savings), Texas (9.6% savings), Montana (14%), Oklahoma (10.4%), and Washington (5.5%). However, as explained in [Appendix E](#), the procedure used to account for shutoffs in the latter three locations (Montana, Oklahoma, and Washington) may be considered suboptimal by some experts. The other 11 evaluations may have overestimated savings from prepay because they included “energy saved” from disconnections in their savings estimates.

Several factors contribute to our assessment of the quality of evaluations. These include sample size, evaluation time (and, by extension, amount of data used for the evaluation), and evaluation design. In general, a larger sample size and more data lead to more-accurate evaluations as results can apply to the greater population. Most evaluations lasted approximately one year and often included usage data from one year prior to prepay implementation, which is a reasonable length of time and number of data points (assuming monthly billing data were used). Six Tennessee evaluations had short, but borderline reasonable, evaluation periods (approximately one year), and one Montana evaluation had approximately nine months of prepaid usage data, but also some additional (unspecified number of) months prior.

Eight of the 16 evaluations had small sample sizes (201 or less), including five in Tennessee, one in Washington state, one in the Carolinas, and one in Arizona. Small sample sizes can make finding significant results more difficult and make results less generalizable. Savings from all but one of these programs (Carolinas) were statistically significant, but the generalizability of the results to the broad residential customer population from these non-randomly selected (and sometimes small) samples remains a fundamentally unanswered question. This makes it difficult to estimate what the energy usage reduction potential might be from such programs if applied in any broader context.

In terms of methodology, the ideal evaluation would rule out as many extraneous variables as possible to offer the strongest argument that prepay causes reduced energy consumption. As is typical of empirically based energy efficiency evaluations, none of the studies employed a fully random or quasi-random experimental design, which would offer the strongest evidence that prepay causes a change in behavior and energy use. A pre-post evaluation with no control group offers the weakest evidence for causation because it fails to account for possible confounding variables, such as temperature, general economic conditions, and so forth. Four programs used this type of evaluation (with some of the highest savings figures: Montana 14%, Kentucky 11.1%, Oklahoma 10.4%, and Washington 5.5%). A stronger pre-post evaluation includes a matched control group (prepay customers matched to similar non-prepay customers). Seven programs used this type of evaluation, including all those in Tennessee (5.6%, 6.7%, 5.0%, 6.9%, and 11.7% savings) and one from the Carolinas (which was not statistically significant). An even stronger evaluation would combine a pre-post evaluation and a matched control group using a difference-in-difference analysis (examining the difference in usage before and after the time that prepay began and comparing that difference between control and prepay customers). Three evaluations used this strategy, including all three Arizona evaluations (12%, 12%, and 7.5% savings).

The two remaining evaluations used unconventional methods. One of the strengths of the South Africa evaluation is that it ruled out one important potential extraneous variable, self-selection bias, by including only participants who were involuntarily enrolled in prepay. This evaluation used a pre-post evaluation method but observed 27 groups of prepay enrollments that were enrolled on a random schedule, thus strengthening its case for causality. Although the Texas evaluation used a nonmatched control group, evaluators attempted to compensate for self-selection bias statistically. Even so, the method of implementing this compensation could be argued to be not as effective as the inclusion of a control group (see [Appendix E](#) for details).

Some of the reported energy reductions could have been the result of deprivation as opposed to energy efficiency behaviors. Only one of the evaluations that we reviewed measured the energy-reduction actions of prepay customers (Oklahoma). This report found that customers self-reported numerous specific behaviors, such as turning off lights, lowering water heater temperatures, and changing appliance usage. Of the reported behaviors, two correlated with actual usage reductions: (1) purchasing a new thermostat and (2) allowing electricity to be remotely disconnected (which could be associated with deprivation). In New Zealand and Mozambique, in-depth interviews with prepay customers complemented these findings (O’Sullivan, Viggers, and Howden-Chapman 2014; Baptista 2015). Increased feedback while on prepay plans facilitated learning about electricity use from different appliances and subsequent rationing of their usage. However the New Zealand study also noted that prepay plans “encouraged householders experiencing severe hardship to take extreme measures when restricting their energy use” (O’Sullivan, Viggers, and Howden-Chapman 2014, p. 1).¹⁸ The question of deprivation, therefore, remains unanswered, and we examine it in more detail later in this report.

The generalizability of these results to a broad Minnesota residential customer population could be problematic. Prepay plan evaluations that reported participant information had customers that were not representative of the general population, and sometimes a small numbers of participants.¹⁹ This could make estimation of savings in a broader context difficult.

Overall, the 16 evaluations demonstrate that customers on prepaid electricity programs on average reduce their consumption relative both to their previous usage on postpay and to other customers who stayed in postpaid programs. However, current evaluations make the degree of expected savings difficult to quantify. To date, few studies offer high-quality evaluations that have large sample sizes and long durations, exclude energy reductions from disconnections or deprivation, and effectively control for self-selection bias.

Several explanations exist as to why prepay programs reduce consumption, and some of these are not unique to prepay. In the following sections of this report, we delve further into these questions and explain why each element or possible cause of savings needs to be examined independently (with additional details provided in [Appendix B](#)).

¹⁸ For example, extreme measures may include self-disconnection while residents are at home.

¹⁹ In many cases, prepay participants have low incomes or have difficulties with payment under postpay billing plans.

Prepay Elements That May Cause Energy Reduction

As outlined in the previous section, most current evaluations do not examine which prepay program elements cause electricity use reductions. Pilot designs that isolate the effects of each program element can determine the exact influence each element has on behavior change and electricity consumption. Isolating prepay and postpay differences is important because some elements are criticized for causing deprivation among vulnerable populations, some can be added to postpay programs, and some are unique to prepay. If the effects of these elements are known, program designers can customize programs to effectively save energy while avoiding negative impacts on participants. Evaluations that isolate elements would also determine whether specific elements of prepay could save energy on their own or must be couched within a complete prepay program. We examine these issues because the goal of this report is to investigate energy savings potential of prepay as opposed to general acceptability.

Given the lack of experimental evidence or high-quality quasi-experimental research, we are left with hypotheses about key program elements that, based on previous research, could explain the reduction in consumption attributed to prepaid programs. Some of these elements could be added to postpaid programs, and some are best introduced only as parts of a prepaid program. In Table 4, we review six key elements that differ between prepaid and postpaid programs that can reduce energy consumption on their own, as demonstrated by behavioral science research. Each of the following program characteristics may contribute in varying degrees to prepaid electricity program estimated savings. Only one of these elements is unique to prepay—paying in advance. Active payment, inconveniences, costs to customers, and quick disconnections may be added as elements in postpay programs, though they may be more difficult to include. Postpay programs can easily incorporate feedback elements, especially in areas where smart meters are installed. In [Appendix B](#), we explain how and why these elements work to save energy independent of prepaid programs.

Table 4. Prepaid electricity plan elements that may cause energy reduction

| Element | Explanation |
|--------------|--|
| Feedback | Prepay plans come with real-time (or near-real-time) feedback about remaining credits and/or energy use. The feedback is described in metrics the customer can understand and facilitates learning and empowerment to make changes to behavior. This feedback helps customers understand how behavior, electricity use, and cost are linked. People who receive feedback about electricity use generally reduce their consumption. Although this effect may be increased when it is provided in the context of prepay, feedback also exists independently of prepaid plans. Notably, this element can be implemented in postpay. |
| Fast shutoff | Customers (particularly those with constraints on income) may defer action on electricity bills until there is an immediate risk to health, safety, or well-being. By making disconnection immediate, customers are more likely to act quickly to keep their power on, even if they are struggling to pay for other necessities. In addition, the savings from some programs can be partly accounted for by service disconnections, as opposed to energy efficiency behavior change. Implementing faster and stricter disconnection policies would be difficult for postpay plans, as customers pay after receiving service. |

| Element | Explanation |
|--------------------------------|---|
| Costs to customers | Some evaluated prepay plans are slightly more expensive for customers than equivalent postpay plans. This slight difference in costs may explain a small part of the difference in consumption. Some of the evaluated programs include built-in debt repayment measures, so part of a top-up payment goes to arrearage reductions. Although this may be a benefit for customers, it nevertheless leaves them with less money to spend on electricity. At least one program we are aware of had a large number of customers in this situation (EPRI 2010). In many cases, top-up payments also have transactions fees. Therefore the overall program costs may be higher for all customers, which impacts income-constrained consumers. These higher costs can partly explain electricity savings. Using this method—increasing costs to reduce electricity consumption in postpay plans—is not recommended, especially for programs that typically target low-income customers. |
| Usually more frequent payments | In currently available program evaluations, consumers on prepaid plans usually pay for electricity more frequently than those on postpay plans. Paying more frequently could increase the chances of missing a payment or, especially for customers traveling to a kiosk, increase the overall effort required to pay for electricity. This overall effort could act as a slight barrier to topping up and could, therefore, on average across all participants, slightly reduce electricity consumption. Conversely, postpay customers usually pay only once per month, at a time that is convenient (within the span of several weeks after receiving the bill), or they can subscribe to autopay, which automatically pays their bills each month, further decreasing effort. Consumers in an SRP evaluation traveled an average of two to three miles to a kiosk to purchase electricity credits three to four times per month. This potential behavior-influencing factor cannot be easily applied to postpay. |
| Active payment | Individuals who are made to actively decide how much credit to add to their electricity account may subsequently pay more attention to the electricity they are using. Prepay customers typically purchase credits more frequently than postpay customers pay their bills. Each time prepay customers reload, they must choose how much to add. This increased attention and decision making may subsequently lead participants to pay more attention to how much electricity they are using. One Texas prepay program sent customers energy bills each day. It would be challenging for utilities to use this strategy of active payment methods with postpay customers, and if prepay implementers create an autopay option then this factor may become less important and behavior change might be slightly reduced. |
| Paying in advance | All else being equal, people spend more money when using credit cards than when using cash. Loading up prepay meters in advance of using the electricity is like the process of getting cash from the bank before spending it. Conversely, paying for electricity after using it is like spending credit and then paying the balance later. Possibly the same mechanism that works to reduce spending with cash also works to reduce spending on electricity for prepaid program participants. This is likely a limited effect and one that requires additional research. Although postpay customers can pay in advance, the requirement to do so is unique to prepay, and therefore few postpay customers take up that option. Utilities are unlikely to save much electricity by using this strategy within a postpay context. |

Feedback

Although an in-depth discussion of most of these behavioral influences can be found in [Appendix D](#), we elaborate here on one specific factor, feedback. One universal aspect of prepaid electricity programs is the inclusion of some sort of feedback mechanism that allows consumers to learn how much energy they are consuming. In some cases, this may be in-home displays that provide real-time information

(Faruqui, Sergici, and Sharif 2010), and in others it might be text, email, or phone alerts when customers' balances are low (Martin 2014). Modern programs that use smart meter technology also have the option of providing feedback on the web, in mobile phone apps, or through other integrated devices. As recommended by psychology researchers, new prepay software companies present their feedback in metrics that matter to consumers (e.g., dollars rather than kilowatt hours), and they use messages that are motivational and empowering. Prepay customers, even without smart meters, have reported using this feedback to systematically test appliances in their homes to learn how much electricity each one uses (O'Sullivan, Viggers, and Howden-Chapman 2014). International examples of prepay programs rarely use smart meters and instead usually provide feedback through a wall-mounted in-home device (often called a *keypad*) that is used to control the home's electricity and facilitate recharging of the account (see Esteves et al. 2016 for photos of some common devices). Nevertheless feedback is important in all contexts.

Feedback is a behavior change strategy that is supported with a large body of evidence from the field of psychology and can reduce energy consumption on its own, without the need to pay in advance (e.g., Karlin, Zinger, and Ford 2015). However feedback within the context of prepay may be more powerful than within postpay. Aside from using effective messaging and metrics that empower customers, they also come bundled with other motivators that encourage customers to attend to the feedback. One Japanese study found that the amount of attention participants paid to their feedback (i.e., the frequency of use of their in-home displays) affected their demand elasticity for energy (Matsukawa 2004). This suggests that participants who are motivated to pay attention to their feedback devices might be more likely to conserve electricity. If other aspects of prepay programs (e.g., rapid shutoff) can motivate this increased attention, then feedback might have a stronger impact on behavior. This hypothesis has yet to be directly tested, but it could explain why feedback alone might not reduce electricity usage as much as within a prepay context.

Another difference between prepay and postpay feedback is the presentation of loss as opposed to gain. Feedback in prepay programs usually takes the form of information about the amount of electricity that consumers have remaining in their accounts, as opposed to the amount of electricity that they have spent so far (i.e., consumed from a specific point in time). This counting down in prepay as opposed to counting up in most feedback research could somewhat invalidate a comparison between the feedback research to date and prepay feedback. Although some nonexperimental evidence indicates that in-home display programs with prepay might, in some cases, encourage consumers to use less electricity than programs that use only in-home displays without prepay (Faruqui, Sergici, and Sharif 2010), this evidence is equivocal and no program has yet tested the effects of a counting-down feedback approach without prepay. Feedback that is presented as a countdown might be innately more effective than feedback that counts up because of a loss aversion effect (Tversky and Kahneman 1991).²⁰ Therefore future studies comparing the effectiveness of feedback in conjunction with prepay and postpay plans should use the same (countdown) type of information with both types of plan to get an accurate understanding of the potential additive effects of prepay.

²⁰ *Loss aversion* refers to the general tendency for people to prefer avoiding losses to acquiring equivalent gains.

Effective feedback (with messages that motivate and empower customers) may be a primary reason that prepay plans reduce electricity consumption, and this is not a feature that must be unique to prepay. However, more research is needed to learn whether feedback is more powerful within the context of prepay than with postpay. Tests are needed that explore feedback devices with and without prepay and with information that is presented in an equivalent manner.

Uncertainty about the Most Important Influences

Without experimental trials to test prepaid electricity program elements independently and together as one program, we cannot say with certainty which elements are required for prepaid programs to change behavior and reduce electricity consumption. The full suite of influences working together may be required to change behavior. However, if savings can be achieved without fast shutoffs or increased costs, implementers may wish to create prepay programs that exclude these factors. If energy efficiency is the goal of the program, then examining these influences independently is important.

Some evidence from qualitative interviews with prepay participants indicates that the combination of prepay program factors, especially feedback and disconnection, work together to reduce consumption (e.g., O’Sullivan, Viggers, and Howden-Chapman 2014). Prepay program customers learn from the feedback they receive and are motivated to pay attention to that feedback to avoid using up their credit and getting electricity shut off. They are also more motivated to understand how much behavior affects electricity usage because they are more engaged in paying electric bills. Customers do not claim that the increased costs associated with prepaid electricity programs affect their behavior, but as with any qualitative interview-based study, answers that are explicitly provided may not explain all behavior variances. This may require additional examination.

Could these behavioral influence elements be incorporated into postpay plans to achieve the same conservation effects? For some aspects, the answer may be yes. Postpay plans could include enhanced feedback devices that provide understandable and motivating information to customers (more than provided by traditional feedback devices). If most of the prepay conservation effect is the result of this type of feedback, then the result could be replicated with postpay customers as well. Further research would be needed to determine whether clear feedback on a declining available account balance has more impact on consumption than feedback on how much energy has been used. For example, customers could be alerted to a pattern in their usage and predicted bill amount, e.g. “You have \$x of electricity usage left this month before you reach your average for this time of year.”

Other elements are more difficult to apply. Postpay plans could have stricter (and faster) disconnection policies, they could encourage customers to pay small amounts more often or in advance, they could be made more expensive, and they could require active payment (rather than allowing autopay). However, these policies would likely be unwelcomed by regulators, consumers, and utilities alike. Prepay programs could likewise have less-strict disconnection policies (or no disconnections, which some have proposed), could have identical costs (which some do), and could allow autopay (which some do). Even so, this full combination of user-friendly practices has yet to be tested for electricity savings. Prepay

programs with and without these elements would need to be systematically tested to understand which elements are most important to achieve energy savings.

Prepay Considerations from Opponents and Advocates

The case for prepaid electricity as an energy efficiency program has both strong proponents and opponents from across a variety of sectors. Through our interviews and additional research, we identified a variety of considerations raised by both sides. As Minnesota stakeholders contemplate prepay programs as a potential part of the state's energy efficiency strategy, they should examine these considerations. We begin with an examination of why prepay programs are usually implemented and then move to a discussion of themes that are raised by opponents and advocates of prepaid electricity.

Motivations for Implementing Prepaid Electricity Programs

Most utilities implement prepay programs for reasons other than energy savings. In many cases, evidence points to the expansion of prepaid electricity options internationally (Esteves et al. 2016) and domestically (Prepaid Energy Hub 2015) without an energy efficiency focus. In countries such as Australia, New Zealand, and the United Kingdom (and especially Northern Ireland), utility companies implement prepay options to reduce debt collection issues and nontechnical electricity losses (primarily caused by fraud activities), as well as to help low-income households avoid high bills (Esteves et al. 2016).

Although US prepay programs are less established, DEFG has collected information on the initial US programs. In their database of 40 programs (N. Treadway, Managing Partner, pers. Comm., July 12, 2018), implementers claim their primary reasons for implementation are²¹

- Providing customers an additional payment option (18 programs)
- Reducing debt, offering debt recovery options while keeping electricity on, reducing write-offs (8 programs)
- Providing energy efficiency, demand-side management (DSM), or conservation programs (8 programs)
- Increasing customer satisfaction or customer service (7 programs)
- Avoiding deposit required for postpay (7 programs)
- Leveraging installed AMI technology (3 programs)

The potential costs and benefits of prepaid electricity plans include both direct and indirect considerations. In Table 5 and Table 6 we summarize these costs and benefits, based on our stakeholder interviews and literature review (in particular DEFG 2016).

²¹ Some programs have multiple reasons.

Table 5. Prepay program costs and benefits to customers

| Potential costs | Potential benefits |
|---|---|
| <p>Potential additional monetary costs for²²</p> <ul style="list-style-type: none"> - Higher kWh rates - Program fees - Security deposit (for in-home display) - Reconnection or disconnection fees - Transaction fees from third-party vendors, such as payment kiosks - Communication costs (e.g., text messaging) <p>Required payment of</p> <ul style="list-style-type: none"> - Outstanding debts with every top-up (up to 40% of top-up payment can sometimes be required to go toward arrearages) - Minimum amount for top-up purchases <p>Time spent</p> <ul style="list-style-type: none"> - Paying for electricity (typically several times per month) - Commuting to a location more frequently to pay for electricity, especially if paying by cash or check²³ - Learning about household behavior and electricity use <p>Potential health or safety effects from going without electricity more frequently²⁴</p> | <p>Reduced electricity usage</p> <p>Increased knowledge about how behavior relates to electricity use and electricity costs</p> <p>Increased sense of control from</p> <ul style="list-style-type: none"> - Electricity budget being set in advance - Allowing more convenient payment options than postpay - Having a larger selection of electricity plans from which to choose - Allowing small incremental payments, when cash becomes available <p>Allow budget-constrained customers to continue getting power by</p> <ul style="list-style-type: none"> - Providing an option that does not require an initial deposit - Providing a way for customers to pay off arrearages over time while still receiving electricity service |

²² Many new programs waive these additional fees.

²³ An estimated 11% of Americans pay electricity bills in person (Albertazzi 2017).

²⁴ Prepay customers may go without electricity more frequently, but some evidence suggests that disconnection periods may be shorter than in postpay (APS 2015). The difference in health effects from disconnections under both plans requires additional research.

Table 6. Prepay program costs and benefits to utilities

| Potential costs | Potential benefits |
|--|--|
| Investment in <ul style="list-style-type: none"> - Advanced metering infrastructure - Communications - Meter data management - Customer information system - Systems build/integration - Call center (staffing, training) - Prepay software | Increased revenue from <ul style="list-style-type: none"> - Better revenue recovery - Sometimes higher rates - Avoided costs for paper billing - Avoided collections and termination costs - Fewer nontechnical losses (usually fraud activities and theft) |
| Payment for <ul style="list-style-type: none"> - Transaction fees (if third-party charges are covered by the utility) - Legal - Marketing | Improved customer satisfaction from <ul style="list-style-type: none"> - Reduced customer abandonment - Improved customer experience - Providing additional plan options |
| Effort and time for <ul style="list-style-type: none"> - Business change - Regulatory approvals | Improved business practice outcomes from <ul style="list-style-type: none"> - Possible higher call center morale because customers may call less frequently about high bills and shutoff complaints |
| Reputational effects from <ul style="list-style-type: none"> - Perception that utility is motivated by revenue recovery - Consumer advocate criticism - Negative media attention | Improved business practice outcomes from <ul style="list-style-type: none"> - Utility meeting its mandate to leverage advanced metering infrastructure technology |

Table 7 provides a brief overview of each prepay consideration or theme we identified through interviews and research. [Appendix A](#) contains more detailed information about each interview theme.

Table 7. Common themes from interviews about prepaid electricity plans

| Category | Theme | Description |
|----------|---|--|
| Research | Lack of research | Current research does not adequately explain why prepay energy leads to energy savings. More and better studies should be conducted to provide better program evaluations. |
| Customer | Customer satisfaction | Many prepay programs highlight high customer satisfaction. |
| | Customer control | Prepay allows customers to control their energy use and save on their energy bills. |
| | Voluntary | Prepay should be a voluntary opt-in program. |
| Utility | Utility costs | If prepay is not counted as an energy efficiency program and customers do see an energy reduction, utilities may face lost revenues. |
| | Utility savings | Utilities can recoup customer payments that may have been lost in arrearages through payment options in a prepaid plan. |
| | Prepay instead of other efficiency measures | Some advocates argue that utilities should spend their money on typical energy efficiency programs, and using prepay plans as energy efficiency programs could be a distraction or divert resources. |

| Category | Theme | Description |
|----------------------|---|--|
| Consumer protections | Disconnection as main motivation for energy savings | While disconnection is a contentious issue for consumer advocates, disconnection likely is a strong motivator of energy savings. |
| | Deprivation | Some are concerned about whether prepay motivates customers to save energy through efficiency actions or deprivation actions. |
| | Quality-of-life concerns | Some believe that prepay will improve quality of life, while others are concerned that it will reduce quality of life. |
| | Targeting low-income customers | Many prepay programs tend to target low-income customers either overtly or indirectly. Given the vulnerability of this group, consumer protection concerns are particularly important. |
| | Equity concerns | Concerns center on ensuring that prepay programs maintain consumer protections. |
| Regulation | Regulatory concerns | Some regulatory decisions have rejected prepay programs for several reasons. |

Research-Related Themes

Prepay electricity program evaluations do demonstrate energy savings. However most interviewed stakeholders—including both prepay advocates and consumer advocates—indicated that more research is needed to determine whether prepay should become a utility efficiency program offering. Researchers suggested that evaluations should parse out different elements of prepaid programs to determine what leads to energy savings. Pilots could also see what impact disconnection has on energy savings by testing financial motivators such as late-pay penalties or rewards for on-time payments. Interviewees also suggested collecting information on self-disconnection statistics to better track and calculate prepay electricity savings. In addition, one consumer advocate felt so strongly against prepay programs as an energy efficiency measure as to believe it was unethical to even study prepay as a pilot program. Even so, with proper oversight, consumer protections, and strong evaluation design, prepay pilot programs can provide important information to help regulators determine whether prepay is an ethical approach to energy efficiency.

Customer-Related Themes

Customer Satisfaction

Existing program evaluations suggest that prepay program customers feel a high sense of satisfaction. In some cases they may prefer prepay to postpaid plans despite some of the potentially punitive characteristics (e.g., Baptista 2015; O’Sullivan et al. 2013). Our interviews with one prepaid program proponent cite anecdotal evidence of customers calling utilities to thank them for the program. An academic expert who had interviewed low-income customers also mentioned that some Arizona interviewees specifically chose to live in regions that had a prepay program. Some consumer advocates

claim that satisfaction surveys from utilities and prepay advocates are not made public, and therefore questions asked cannot be scrutinized. However, we found that these surveys do tend to align with peer-reviewed research and our interviews with nonaffiliated parties. Minnesota utilities also found the customer satisfaction research to be very compelling and worth closer examination. These utilities felt that prepay payment options provided customers and members with a convenient and transparent way to handle utility bills.

Customer Control

Stakeholders often cited customer control as a prepay program benefit because customers can reduce the surprise of a high bill by setting their energy budget and paying in advance. They can also understand how behavioral choices and actions affect their utility bill on a near real-time basis versus waiting a month to see their use over a long period. One Minnesota utility felt that because customers will not be surprised by big bills—one of the main reasons customers call—prepay programs can be a carrot rather than a stick. For customers without much financial flexibility, having transparent and real-time data will allow for better bill management. Although this was a clear theme in discussions with stakeholders, we note that at least one report suggested that customer control may not necessarily be a characteristic that must be unique to prepay (Howat and McLaughlin 2012).

Voluntary Program

Most, if not all, stakeholders indicated that prepay programs should be voluntary opt-in programs. The majority of US prepay programs are voluntary in that they allow customers to switch to other payment methods if they are unhappy. While many stated that prepay programs are currently opt-in, some consumer advocates argued that prepay is not always voluntary due to barriers, such as high deposits or accumulated arrearages, that may prevent a customer from enrolling in another payment plan.

Utility-Related Themes

Utility Costs

Although customers enrolled in a prepaid program may have potential energy savings, some utilities have regulatory concerns that prepay programs cannot be counted toward efficiency. Regulatory-sanctioned energy efficiency programs allow a utility to count savings toward their efficiency portfolio. However, if programs are not considered efficiency, savings may lead to reduced revenue over time. One consumer advocate suggested that prepay programs could be added to utility decoupling models separately from energy efficiency so that costs can be recovered from reduced revenue without counting prepay toward utility efficiency requirements.

In addition, utilities incur associated prepay program infrastructure costs, such as the installation of AMI. While many utilities are moving toward AMI, Minnesota has been slow to increase penetrations across

the state, with smart meters accounting for less than 20% of all residential meters (EIA 2017). Although programs in other regions of the world have operated prepay programs for decades without AMI, these meters are the North American standard for their ability to provide granular data on real-time energy use through in-home displays and smart devices. One Minnesota utility said they would not want to move forward with prepaid programs without AMI because real-time data impact customers the most. AMI also allows utilities to communicate via multiple channels.

Utility Savings

Prepay programs often address arrearage repayment issues by incorporating debt repayment into each bill top-up payment. This payment option may be more manageable for customers in debt, potentially allowing them to stay out of future arrears. Utility stakeholders and other prepay proponents have suggested that this process helps both the customer and the utility in terms of reducing overall arrearages and, in turn, decreases associated accumulated debt costs for the utility.

Interviewees cited additional utility cost savings associated with disconnections. AMI with a prepay program structure allows for these savings as the utility can disconnect customers remotely and reconnect them quickly—often within hours and with no need to send a technician to the home. Opponents argue that this benefit may not be unique to prepay but rather to AMI implementation.

Prepay instead of Other Efficiency Measures

As noted earlier, whether prepay programs should be considered for energy efficiency program portfolios is subject to debate. Current evaluations suggest that prepay programs can gain significant energy savings. However, several consumer advocates voiced concerns that these savings accrue at the cost of consumer comfort or basic needs. Some felt that the savings were primarily from deprivation and disconnects. One advocate felt that while prepay did allow customers increased control over energy bills, more research is needed to determine the effectiveness of prepay as an efficiency measure. Many consumer advocates felt that utilities should spend money and resources on traditional energy efficiency program measures, such as retrofits and weatherization, rather than on prepay infrastructure.

Utilities, especially those in Minnesota, expressed strong interest in having prepay as both a payment option and a behavioral efficiency program, like home energy reports. They felt that having prepay included as an energy efficiency program would allow them to offer a service that customers want, save energy, and recuperate costs. This becomes especially important as the market transforms for other efficiency measures.

While this topic is still debatable, it is important that it be resolved. In our recommendation sections, we provide a path to building consensus on this issue in Minnesota.

Consumer Protection–Related Themes

Automatic Shutoff

While likely a significant contributor for high energy savings from prepay programs, disconnection is also the most contested prepay program design element. Prepay program advocates highlight the ease with which customers can be disconnected and reconnected without additional fees. Consumer advocates tend to oppose the automatic shutoff element of prepay programs and voice concerns around proper disconnection notification, energy assistance program access, and potential for shutoffs without adequate warning or emergency assistance. One consumer advocate said that disconnection was the core issue, stating that customers can receive feedback and other prepay program benefits without automatic shutoffs—which can lead to higher personal and societal costs such as food and medication loss from refrigerator thawing. Another consumer advocate indicated being less concerned about automatic shutoffs if customers received adequate warning, such as through an in-home display or a live phone application. In addition, most new prepay programs exclude customers who require electricity for medical reasons to avoid life-threatening impacts from disconnection.

Some Midwest stakeholders indicated they were concerned about the automatic shutoff aspect of prepay programs and were interested in exploring ways to avoid disconnection. Some evidence suggests that prepay customers may experience more-frequent disconnections than those on postpay, but two American evaluations found the average amount of time on prepay without electricity is usually about seven hours or less (DEFG 2014; APS 2015).²⁵ Conversely, a peer-reviewed New Zealand study on prepay found that one-third of respondents self-reported disconnections lasting over 12 hours in the past year (O’Sullivan et al. 2013). In general, while some disconnections result from budget constraints, most customers claim they occur due to forgetfulness or lack of time (Mummery and Reilly 2010; O’Sullivan, Viggers, and Howden-Chapman 2014). However one interviewee pointed out that embarrassed customers may understate the frequency of shutoffs due to budget constraints.

We spoke with two Minnesota utilities that were reluctant to include remote disconnects as part of the program yet would seek regulatory guidance on the appropriate path forward. One method by which a program could be implemented without remote disconnects is providing the customer a short grace period, followed by a transfer to a traditional postpay structure.²⁶ For Minnesota, a particular issue will be avoiding or minimizing disconnections during the prime heating season.

²⁵ Based on a limited comparison of 16 people, one evaluation found that the duration of disconnection was significantly shorter on prepay than on postpay (APS 2015).

²⁶ One example of this procedure was proposed by a Midwest utility for a new prepay pilot program (that has since been withdrawn). Under the proposed program, low-income consumers who reach a \$0 balance could accrue arrears for eight days before being transitioned to a postpay plan. Any arrears accrued before being transferred would be paid back by garnishing prepay customers’ top-up payments by 25%. The prepay plan would not require a deposit for initiating service.

Deprivation or Energy Efficiency Behavior

Minnesota lawmakers define *energy efficiency* as a reduction of energy consumption “without a reduction in the quality or level of service provided to the energy consumer.”²⁷ Therefore a program that reduces quality of life or causes consumer deprivation would not be considered effective energy efficiency. Quality of life is primarily a subjective concept, but it also has some objective components (see Glossary for further details). Examining prepay plan effects on participants’ specific behaviors and perceptions may help shed light on whether prepaid electricity plans reduce or enhance quality of life and therefore should (or should not) be considered energy efficiency. In this section, we combine our interview data with information from available literature to evaluate whether prepay plans may negatively or positively influence quality of life.

Improving Quality of Life

Most peer-reviewed academic research on international prepay examples (e.g., Baptista 2015; Mioyogo, Nyanamba, and Nyangweso 2013; O’Sullivan, Viggers, and Howden-Champan 2014; O’Sullivan et al. 2013), along with most other domestic and international prepay reports (e.g., CER 2011; Z2Solutions 2014; DOE 2015; Wimberly 2014), agree that customers on prepaid electricity plans are satisfied with the service and may, therefore, experience a slight improvement in their subjective quality of life. O’Sullivan and colleagues (2013, 2014) interviewed and surveyed prepay customers to understand what they think of the program and how it has changed their behavior. She found that, despite a few concerns, such as the physical location of the meter in their homes and the accessibility of payment kiosks, consumers liked the program. Her participants were in New Zealand and, despite higher per-kWh rates for prepay (at the time) and higher likelihood of disconnection, they nevertheless felt that the benefits of prepaid electricity outweighed the costs. Interviews by Professor Diana Hernandez at Columbia University of prepay program participants in Arizona found that they generally favored having prepay meters, as it allowed them to “closely monitor consumption, manage costs, and avoid large bills.” Some participants mentioned choosing where they lived based partially on the availability of prepay (D. Hernandez, professor, Columbia University, pers. comm., July 12, 2018).

Similarly, program evaluations such as those in rural US cooperatives report customer satisfaction rates of 80% or higher (Z2Solutions 2014; DOE 2015). Consumers like prepay programs because they help participants budget and control their bills (e.g., Wimberly 2014), avoid large deposits required for postpay plans (Z2Solutions 2014), and provide flexibility for controlling use (e.g., topping up with frequent small payments when cash is available; D. Hernandez, Columbia University, pers. comm., July 12, 2018).

Prepay customers also learn about how much electricity each household behavior uses in ways that most postpay customers do not. Those with limited incomes can then ration and budget electricity use for what is most important to them (O’Sullivan, Viggers, and Howden-Chapman 2014; Baptista 2015). For example, consumers may cut back on ironing their clothes because they learn how much electricity

²⁷ Office of the Revisor of Statutes, 2017 Minnesota Statutes, section 216B.241, subdivision 1 is available [online](#).

that small task can use (Baptista 2015). They may also prioritize a variety of activities that add to a rich quality of life. Limited-income individuals who must choose between necessities appreciate the flexibility of prepaid electricity plans. Prepay electricity will not alleviate poverty issues or reduce energy burdens, but it allows these customers to control electricity usage without going into debt. For those with debt, prepay allows customers to pay down the balance while keeping the lights on.

According to the few surveys and available interviews, prepay program participants are satisfied with the program and do not indicate they feel deprived of energy use. Notably, however, some surveys are conducted by proponents of prepaid electricity (e.g., Wimberly 2014, 2018), and none include participants who chose to switch from prepay back to postpay. Therefore, although the overall evidence suggests that customers like prepay plans, this finding could be somewhat influenced by a selection bias.

Reducing Quality of Life

Despite evidence that points toward improved subjective well-being, consumer advocates argue that prepay electricity plans reduce quality of life for three primary reasons:

- They increase the number of disconnections.
- They may reduce customer protections.
- They can be more expensive.

In response, most modern proposed or planned prepay electricity plans attempt to address these concerns. Nevertheless several recent state regulatory decisions have gone against applications for prepaid programs and pilots because of consumer protection issues (see [Appendix C](#) for a review of these decisions).

Subjective well-being and objective well-being may not always align. Although subjective well-being and satisfaction are important to consider, objective measures of fairness and health are also worth examining. For example, consumers may be willing to spend more to participate in a prepaid electricity program and may experience increased subjective well-being, but from a macro perspective those additional costs may nonetheless reduce quality of life (especially given that prepay consumers usually have lower incomes), and more objective health measures might be useful to examine. Prepaid electricity plans may be appreciated by plan members, but advocates argue that other programs may reduce electricity use while better protecting low-income customers.

Few studies investigate the health outcomes of low-income prepaid electricity plan customers. Professor Diana Hernandez recently interviewed several low-income residents in Phoenix, most of whom were using prepaid electricity plans, and found that while the prepay participants she interviewed liked the program on a widespread basis, they also described depression, anxiety, and worry over their inability to pay bills as well as physical health conditions that emerged due to this stress (D. Hernandez, professor, Columbia University, pers. comm., July 12, 2018). One New Zealand study found that prepaid electricity customers sometimes reported cold housing, with 57.2% claiming they could see their breath condensing inside at some point and 67.5% stating that they were shivering on at least one occasion

(O'Sullivan et al. 2013). Nevertheless more studies of objective health outcomes of prepaid electricity customers are needed.

In New Zealand in 2011, elderly and those with chronic obstructive pulmonary disease (COPD) on prepay plans reported in interviews that they were concerned they might be left without power for required medical devices (O'Sullivan, Howden-Chapman, and Fougere 2011). Responding to concerns that low-income prepay consumers may engage in extreme self-rationing that can prove a health and safety risk, most prepay plans now include consumer protection clauses and do not allow customers with certain medical histories to participate. Traditional postpay plans include consumer protections that require sufficient notice before disconnection.

According to research conducted in New Zealand, prepaid electricity programs may not be an effective method of alleviating fuel poverty for the poorest customers (O'Sullivan, Viggens, and Howden-Chapman 2014).²⁸ Although low-income customers may feel empowered by prepay, they simultaneously put themselves at risk from disconnection-related problems. These customers are most likely to ration their electricity use but have fewer rationing options than others and less money to invest in energy upgrades. Therefore they are more likely to self-disconnect and experience other negative health and quality-of-life impacts (O'Sullivan, Viggens, and Howden-Chapman 2014). Notably, disconnection can also be a problem for some customers in postpay plans.

According to the current Minnesota application for the federal Low-Income Home Energy Assistance Program (LIHEAP), low-income prepay customers would likely qualify for the seasonal benefit, but the crisis benefits might need to be revisited in the context of prepay (because one of the criteria is that electricity is about to be shut off, which may happen more frequently under a prepay plan).²⁹ LIHEAP seasonal benefits are provided to families based on energy cost, household size, and income (MN Department of Commerce 2018). However, LIHEAP applications are not consistent across states, and some agencies may find it difficult to provide prepay customers with bill assistance subsidies through LIHEAP or other bill payment programs. Some states require high bills or arrearages to award a LIHEAP grant, which is not possible on a prepaid plan (LIHEAP Clearing House 2014). Prepay customers in those states who benefited from LIHEAP may, therefore, experience a reduced quality of life. Notably, even if LIHEAP crisis funds are made available to prepay customers, they may not arrive quickly enough to avoid shutoff (Utility Bill Assistance 2018).

Targeting Low-Income Customers

Low-income customer impacts are important to consider. Some consumer advocates are concerned about how prepay and automatic shutoffs affect customers already strapped for resources and susceptible to disconnections. Some propose denying these customers access to prepaid programs, while others advocate state-level customer protections for enrollees. As an example, programs can

²⁸ *Fuel poverty* is defined by [Hills \(2012\)](#) as a state in which a household's required fuel costs are above the median level, and after paying the energy bill the household is below the official poverty line.

²⁹ The application is available online at the Minnesota government [website](#).

ensure that prepay customers receive adequate notice and have access to bill payment assistance programs or receive discounted kWh rates.

While most prepay programs do not indicate that they are directly targeting low-income customers, many are either indirectly enrolling or attracting them. According to our literature review and interviews, part of the reason that low-income customers are drawn to prepaid electricity program participation is that they prefer not to pay or are unable to pay the deposit required for postpaid plans. In other cases, these customers have arrearages that must be settled before they can re-enroll in postpaid plans (Howat and McLaughlin 2012). Low-income customers with constrained budgets sometimes like the predictability and control they get from prepaid electricity plans (e.g., Wimberly 2014). Budget-constrained consumers may also reduce their consumption more than any other income group in response to enrolling in prepaid electricity plans (APS 2015; Jack and Smith 2016).

Equity Concerns and Consumer Protections

Interviewees stressed that prepay programs may pose some equity concerns in terms of program design and implementation. Some program design costs, such as topping-up transaction fees or text messaging fees, are borne by the customer. Utilities sometimes charge prepay program customers a higher rate as well. These factors may make the program more expensive than other payment options, which is particularly concerning for low-income program participants.

Regulatory Concerns

State regulatory decisions regarding prepay programs are few. This is largely because electric co-ops, not typically subject to state rate regulation, implement most prepay programs. State regulators are usually bound by extensive consumer protection rules and have expressed concerns about consumer protections when faced with prepay program proposals from state commission–regulated investor owned utilities (IOU). Regulators also find it more difficult to approve waivers of shutoff rules and are often challenged by consumer advocate groups during IOU prepay proposal proceedings.

We reviewed seven recent state regulatory decisions pertaining to the following utilities: Arizona Public Service (2015), PECO (PA PUC 2018), Duke Energy Ohio (OH PUC 2010), Progress Energy Carolinas (NCUC 2012, 2018), Ameren Missouri (MO PSC 2017), Westar (KA CURB 2016), and SDG&E (CA PUC 2014). We briefly summarize each of these decisions in [Appendix C](#). These utility applications for prepaid electricity pilots or program expansions were denied for several reasons. The most common was a concern that the proposed programs would not provide sufficient consumer benefits and, in some cases, might cause consumer deprivation. Another common reason for denial was an insufficient argument for the programs' cost effectiveness as a customer billing option. Energy efficiency was rarely positioned in these proceedings as a key benefit of prepaid electricity programs.

Minnesota Regulation

The long heating season in Minnesota is also an important factor in regulatory reviews of prepay programs. Under postpay plans, customers' unpaid use of electricity during especially cold months is accumulated as arrears. Under a prepaid system, customers who run out of electricity credits generally cannot accumulate arrears. In some regions, such as Northern Ireland, this problem is addressed by the provision of small amounts of emergency credits that can be used by customers whenever they like and then paid back through garnishing of top-up payments. This may not work in a region that could have extended peak cold events. Minnesota regulators should specifically address the issue of cold-weather shut-offs in any future discussion of prepay.

A Note on Prepay Programs for Natural Gas Utilities

While our study is focused on prepaid electric programs, a few are offered in natural gas service territories. During our stakeholder interviews, we spoke with a Minnesota natural gas utility to understand their perspective on the feasibility of prepay programs in their service territory. While natural gas and electrical prepay programs have some similar issues, natural gas consumption is fundamentally different from electricity consumption. Consumer protection issues during disconnects are especially important for natural gas utilities due to Minnesota's cold weather rule, but a safety issue also needs to be addressed. If gas is shut off, pilot lights would also go out. For a home without electronic ignition, each pilot would have to be relit manually. If they were not relit, they would pose a serious safety hazard.

An additional issue is around the AMI installations. The natural gas utility representatives that we spoke to did not expect any future AMI installations, and any potential program savings would not justify expensive new meter installation costs.

Potential Energy Efficiency Impacts of Prepay in Minnesota

Estimating Impacts

Given the limitations regarding the available evaluations on this subject, estimating the potential impacts if Minnesota utilities were to offer customers prepayment options is difficult. We are unaware of any other state that has attempted to calculate such an estimate. In producing the estimates contained herein, we made several assumptions on both prepay program structure and technical infrastructure required for a robust program. We provide more description of necessary program design elements in our recommendations section. We would also note that in preparing this estimation, we make no assertion that prepay should necessarily qualify as a conservation improvement program in Minnesota.

We developed two scenarios (Table 8).

Table 8. Description of assumption for Program One and Program Two

| Scenario | Program One | Program Two |
|----------------------------|--|--|
| AMI | In place | In place |
| Selection | Voluntary / Opt-in | Voluntary / Opt-in |
| Savings from disconnection | Savings from disconnections are excluded from final evaluation | Savings from disconnections are excluded from final evaluation |
| Disconnection | Upon reaching a \$0 balance, customer receives notification of imminent disconnection. Disconnection occurs at the next legally permissible time | Upon reaching a \$0 balance, customer receives notification but continues to receive electricity for a short grace period. After grace period, customer is transferred to a postpay plan |
| Feedback | High levels via an in-home display, smartphone app, text message, or website | High levels via an in-home display, smartphone app, text message, or website |
| Savings estimate | Average of the strongest evaluations that exclude savings from disconnection | Typical savings value from customers who have participated in an opt-in program with a similar interface |

Program One allows for immediate disconnect upon missed payments. Program Two carries no threat of disconnection (e.g., after a grace period, customers simply move back onto a traditional payment plan if they miss a payment). The reason behind breaking out the savings in this way is that the disconnection

threat may be a strong motivator for saving energy, and some recent program proposals have suggested removing it. While some evaluations analyzed savings excluding energy saved during disconnected times, we believe the programs' influence would be qualitatively different in a scenario without the disconnection threat. Both scenarios assume the following:

- Advanced metering infrastructure is in place.³⁰
- Real-time information can be provided to the customer through several modes of communication (i.e., text, web, and phone).
- The program is voluntary or opt-in.
- The savings rate does not include savings from disconnection.

For the second scenario, we hypothesize that through high levels of feedback and engagement, we would still see energy reductions. DTE Energy Insights is a smartphone feedback app program that provides near real-time feedback on customers' usage. The initial pilot programs demonstrated electricity savings between 1.1% and 3.2% (Sussman and Chikumbo 2016). A similar study of the myMeter app also found 1.8% to 2.8% savings (Dougherty 2014). A prepay program with no threat of disconnect may function in a similar way; however, we feel this area is one where further research would strengthen the ability to produce useful estimates.

We determined our baseline energy consumption from residential sector values recently developed for the Minnesota Demand Side Potential Study as shown in Table 9. Without research that substantiates the specific ways participants reduce energy, we assume that savings can be achieved across all end uses.

The Program One savings rate is derived from an average of the strongest evaluations that control for savings from disconnect. The savings rate for Program Two is based on a typical savings value from customers who have participated in an opt-in program with similar interface, such as the DTE Energy Insights or myMeter smartphone feedback app (Sussman and Chikumbo 2016; Dougherty 2014).

In both scenarios, we assume that every Minnesota utility would offer a prepayment option as an opt-in program. Because of the opt-in nature, the assumed participation rate is low (1%) across all state utilities. The participation number for both programs is based on the participation rates of the only Minnesota utility with a prepayment option (around 400 out of 40,000 members; E. Webster, Vice President Corporate Services, MVEC, pers. comm., June 15, 2018). Other utilities have seen participation rates closer to 5%.³¹ Absent other Minnesota-specific data on similar levels of participation, we kept our assumption at a conservative 1%.

³⁰ At this time, this may be the most significant infrastructure hurdle facing the state. According to the US Energy Information Administration ([EIA](#)), less than 20% of residential Minnesota customers had smart meters installed as of 2016.

³¹ This was reported by a prepay advocacy organization, DEFG, webcast on July 18, 2018.

Table 9. Annual energy reduction estimates and assumptions

| Scenario | Baseline residential energy consumption (GWh) | Annual usage reduction | Total potential statewide annual savings (GWh) ³² |
|--|---|------------------------|--|
| Program One: Customers can be disconnected after payment lapse | 10,627 | 8.5% | 9 GWh |
| Program Two: Customers will not be disconnected after payment lapse but moved to traditional payment plan | 10,627 | 2% | 2.1 GWh |

³² This assumes a 1% statewide participation rate. The preceding text presents additional reasoning behind that assumption.

Recommendations

Given the current state of knowledge, to say whether prepay plans should qualify as energy efficiency under Minnesota's conservation improvement programs would be premature. The number of North American prepay program evaluations is insufficient, and they do not adequately explain why consumers save energy. Some prepay elements that may reduce consumption, such as feedback about use, could potentially be implemented in postpaid programs. Other prepay plan aspects that may negatively affect consumers, such as rapid shutoff, could be removed. However, current evaluations do not attribute savings to features that are not unique to prepay (such as feedback) or potential saving levels without the shutoff threat. Prepay programs save energy possibly due to the entire suite of behavioral influences working together. More research is needed to support this conclusion.

Our Minnesota utility interviews reveal considerable interest in prepayment program concepts. A well-designed pilot program could be a first step to addressing questions and determining whether prepaid electricity plans could be implemented as energy efficiency programs. Should a Minnesota utility be interested in launching a prepaid electricity pilot program, they should design it with consideration of (1) consumer protection issues and (2) evaluation of individual components of the program.

A Framework for Designing a Pilot Program

When designing a prepaid electricity pilot program to encourage energy efficiency, the pilot should both test the importance of key elements and incorporate known structural energy efficiency measures. The pilot program results can help identify which program elements can and cannot be eliminated while still maintaining energy savings. We therefore make recommendations regarding (1) implementation consultations, (2) research design methods, (3) regulatory considerations, and (4) cost-effectiveness evaluations.

Implementation Decision Making

Implementing a prepay electricity program comes with a host of technical, social, and monetary issues that are important to consider. Each of these issues involves stakeholders (e.g., utilities, consumers, and local government agencies) with diverse and equally important perspectives. Prepay pilot programs often fail regulatory review because they have not adequately considered the perspectives of all stakeholders.

One of the most important stakeholder groups is consumers, who are often represented by consumer advocates. Consumer advocates suggest that prepaid electricity programs should always be voluntary (even for consumers with arrearages or severe budget constraints), should not be more expensive than postpay (and arguably should be cheaper), should allow for bill assistance programs to be maintained (e.g., LIHEAP), and should be subject to the same consumer protections as postpay plans (e.g., no disconnections on extremely hot or cold days). [Appendix D](#) provides the National Consumer Law

Center's (NCLC's) complete list of consumer protection recommendations for prepay programs, many of which are addressed in new utility prepay pilot proposals.

Some US not-yet-public prepay programs have been recently proposed (and withdrawn) with alternatives to automatic shutoffs, such as reverting customers to postpay after a short grace period of non-top-ups.³³ Others have implemented a no-fee policy (e.g., no third-party vendor fees, reconnection fees, or deposits). In other regions of the world, some governments mandate that prepay plans have discounted kWh rates (usually 2% lower than postpay; e.g., Ireland and Bangladesh; Esteves et al. 2016; Darby 2006).³⁴ Minnesota stakeholders can consider these policy options for prepay. However, energy savings impacts have yet to be tested and measured under these modified consumer protection conditions.

Utilities offering rate-payer-funded efficiency programs have an additional set of concerns—that efficiency programs demonstrate cost effectiveness. Although preliminary studies indicate that prepay may increase utility profits, utilities may also need to consider upfront investment costs. This issue has come up during some prepay regulatory hearings. To date, only one evaluation we reviewed measured cost effectiveness (APS 2015), and it reported a cost-benefit ratio of 1.03.

We recommend convening a stakeholder advisory group to meet, discuss issues, and propose solutions. This step will adequately consider all stakeholders and viewpoints regarding a prepaid electricity pilot program. Consensus from all stakeholders would be a key piece of the program design process. Stakeholders should include representatives of utilities, consumers, and local government and other experts, such as academic researchers or evaluators.

Research Design

Another key piece of the design process is hiring a third-party evaluator to inform the program design. This dedicated neutral organization is critical to determine the nuts and bolts of program design and evaluation elements that will yield statistically significant and defensible results, such as sample size, duration, and methods. Ensuring neutrality is important for credibility and quality of the final program evaluation.

All acceptable programs must be designed with evaluation in mind. The evaluation should test the hypothesis that prepay electricity programs cause consumers to change behavior and reduce consumption in appropriate, measurable, and cost-effective ways. In other words, the evaluation should test whether the program influenced customers' electricity usage. However, to properly consider whether a prepay program is suitable for use as an energy efficiency program under CIP, the evaluation should do more than simply answer this question. The evaluation should also identify why these savings are likely to have occurred (i.e., isolate specific effects of elements such as feedback and disconnection)

³³ The authors of this report have been contacted to discuss these proposals, but were not authorized to present them publicly.

³⁴ The rationale for this decision is that utilities benefit financially from moving customers onto prepay and should, therefore, pass those benefits back to the customer.

and should provide information on what customers do that results in reduced usage (e.g., install EE measures, engage in constructive behaviors to reduce waste, or engage in actions that represent deprivation or reduced quality of life). The results should come from a large enough and appropriately representative sample, over a sufficiently long period, to be both accurate and generalizable. Due to real-world constraints, one pilot program is unlikely to achieve all these goals. Nevertheless well-designed programs may achieve some of these objectives and, over time, provide sufficient evidence to understand and assess. We therefore offer a few recommendations that will help achieve as many as possible.

Sample Size

Prior to program launch, utilities should work with a third-party evaluator to determine the appropriate sample size. The sample size is critical to this evaluation as it will determine the power of the program to find a statistically significant result. The sample-size calculation will be affected by several factors. Each additional study group will require more participants, but more consumption data per participant will reduce the number of required participants (e.g., fewer participants are required if each is able to provide 12 monthly bills as opposed to one annual average, or 24 monthly bills as opposed to 12 monthly bills). Utilities should assume that some participants will drop out of the program before the pilot is complete and therefore recruit more than are needed for the final analyses. In one evaluation, the implementer noted a 26% attrition rate (Duke Energy Carolinas 2017), which supports the suggestion to over-recruit for a study.

Control and Comparison Groups

The third-party evaluator should suggest an appropriate pilot program control group to determine whether the prepay electricity program (as opposed to other factors, such as changes in weather or economic conditions) caused a change in electricity use. Allowing only two groups (customers with prepaid electricity and control customers with postpaid electricity), as some previous programs have done, enables evaluators to learn whether customers on a complete prepay program consume less electricity than customers on a standard postpay arrangement. However, it does not inform evaluators about other important questions regarding what program features are affecting behavior. By including additional comparison groups, evaluators can learn about these specific issues.

A pilot prepay program can include several potential comparison groups in addition to customers on standard prepay and postpay plans. As more of these groups are included, the results become more informative. Additional comparison groups to consider include

- Postpay plan customers receiving feedback equivalent to prepaid customers (e.g., an app or in-home display that counts down remaining electricity to a set goal or average monthly level using effective metrics and empowering messages)³⁵

³⁵ The type of feedback to include is discussed in greater detail in the *Feedback* subsection of this report (found in the *Prepay Electricity Impact on Energy Use* section).

- Prepay plan customers with an alternative to immediate shutoff (e.g., move to postpaid after a grace period or pay a higher rate to top-up if account goes to \$0 balance)
- Prepay customers with an automatic top-up option (autopay)
- Prepay customers who specifically qualify (and do not qualify) as low income³⁶
- Prepay customers receiving physical efficiency measures such as low-cost home energy kits (with faucet aerators, LED bulbs, and so on) to enhance the energy efficiency aspects of the program (particularly for low-income participants)

Quasi-Random Design

Key to the control and comparison groups is that they are appropriately equivalent to the intervention group. That is, members of these groups should be as similar to the members of the primary prepay group as possible. That way any difference in electricity consumption can be attributed to the differences between programs (and specifically the elements within them). One major problem with most studies featuring nonrandom control groups is self-selection bias. This occurs when customers self-select into the intervention and any reduction in consumption could be attributed to some inherent characteristic of the participants rather than to the program (e.g., they are the type of people who would reduce their consumption anyway).

One South Africa evaluation eliminated self-selection bias by only including participants who were involuntarily enrolled in prepay. Ethical implications make this approach untenable in North America. We recommend using a wait-list control procedure instead. Using this procedure, a limited number of customers interested in the prepaid payment option would be allowed to enroll. Once that maximum participation level is reached, subsequent customers requesting to enroll would be informed that enrollment is full for the year, but they could be enrolled later. In the interim, they could participate in the study as control group customers. These customers in the control group could be provided with incentives to participate in the study, such as entering them into a drawing or some sort of honorarium. Depending on the program design (and future evaluation requirements), they could be offered a free home energy kit or a device that provides energy use feedback (equivalent to prepay).

Customers who are enrolled in the prepaid group could then be randomly assigned to receive the traditional prepay plan or one of the alternative prepay plans described.

Should this quasi-random assignment procedure be unfeasible, program designers could consider using a matched control procedure. This may offer marginally weaker evidence but nevertheless a useful piece of information regarding prepay electricity savings.

³⁶ Comparison groups composed of various demographic segments, such as low income, are not assigned into those groups like other comparison conditions. Instead they are duplicates of other conditions but containing only group members with those specific demographics.

Outcome Measures

Although customer electricity usage is the most important outcome measure with regard to consumption, surveys and interviews with customers will be important for understanding consumer responses and whether the program causes deprivation. Utilities should work with the third-party evaluator to design unbiased, informative, and transparent surveys.

Regulatory Considerations

As explained earlier (and in [Appendix C](#)), no prepay electricity programs to date have been proposed primarily as energy efficiency programs. They are proposed as utility offerings that provide bill payment options for customers, offer debt recovery options, increase consumer choice, and meet utility obligations to leverage AMI installation. Because prepay programs have implications for factors such as billing procedures and shutoff protection rules, the Minnesota Public Utilities Commission would need to be involved in decision making regarding any prepay pilot proposal. Should a prepaid electricity program be proposed as an energy efficiency program under CIP, then the Department of Commerce would also be involved in considering whether that proposal was appropriate under the CIP statute and framework. A utility interested in proposing a prepaid electricity program as part of CIP would need to coordinate the application with each of those Minnesota regulatory bodies.

Cost-Effectiveness Evaluations

Determining the cost effectiveness of prepaid electricity programs can prove challenging because costs and savings are not always directly related to the same budgets within an organization. For example, upfront investment in prepay software may come from a capital investment budget, whereas benefits from decreased arrearages and fewer nontechnical losses may go to operational budgets. Furthermore, nonmonetary benefits such as call center morale and nonmonetary costs such as health risks to customers are difficult to quantify. See Table 5 and Table 6 for our list of potential costs and benefits.

Program planning should involve preparing for evaluation of both monetary and nonmonetary costs and benefits. In Minnesota, this specifically means assessing the costs and benefits to society, the utility, and the participant. The societal costs and benefits are of particular interest and importance for evaluation of Minnesota utility programs.³⁷ To date, only one of the reviewed North American evaluations assessed prepay costs and benefits (APS 2015). It did not include an assessment of societal costs and benefits.

³⁷ For more details, see Minnesota Department of Commerce [website](#) or refer to the recently developed [National Standard Practice Manual](#).

Other Program Design Considerations

In addition to the high-level design, evaluation, and regulatory considerations, utilities considering a prepay pilot program will need to navigate the on-the-ground details of implementing a radical new customer-facing program.

Effective customer outreach and communication are essential for ensuring transparency and understanding. Nearly all the research we reviewed (peer reviewed and proprietary) suggests that customers like prepay services. Nevertheless the costs and risks may be higher for prepaid customers. Thus utilities must carefully plan and budget for a communication campaign that explains the potential benefits of prepay, while also educating customers on potential drawbacks. These could be large-scale media campaigns or direct marketing to target customers, or a combination of both. A discussion with stakeholder groups as well as communications specialists (well before the campaign) could ensure a smooth pilot program launch.

Given the radical shift in the fundamental process of notification and payment, utilities should plan to receive initially higher volumes of customer questions about the service. This may require specialized call center training and additional staff. Some reports from prepay advocates suggest that call center complaints may decrease over time to below baseline and may become less severe.

The new payment system will also require technological enhancements to databases and payment systems. Accuracy and reliability of these systems are vital to the success of the program. If the new system does not work correctly, then customer complaints will increase, trust will erode, and enrollment will decrease.

Summary and Conclusions

Minnesota’s decision as to whether prepaid electricity plans could be used as energy efficiency behavior change programs rests on a combination of three interacting elements:

1. The program’s ability to cost-effectively reduce electricity consumption
2. Program elements that cause electricity reduction
3. The nature of the customer actions that result in the usage reduction (i.e., reducing consumption without reducing level of service)

Previous evaluations suggest that electricity consumers likely use less electricity if transferred to prepaid electricity plans. However, this effect may be in part due to factors that reduce customer quality of life, such as going without electricity more often, or to factors that can be easily applied to postpaid programs, such as feedback.

Programs that optimally address the possibility of consumer deprivation may reduce potential energy savings. When the risk of shutoff is removed and costs are reduced, consumers (especially low-income consumers) will be better protected, but electricity savings may decrease or become nonsignificant. More research is needed to determine the impact of removing shutoffs and changing pricing in prepaid program designs and energy savings calculations.

In examining previous research, assessing current evaluations, and interviewing diverse groups of stakeholders, the clearest conclusion is that more research is required to understand how prepay programs work in North America. Minnesota utilities interested in conducting pilot prepay programs can help fill this knowledge gap. While we neither endorse nor condone prepay electricity programs, we offer a program design framework for interested utilities that addresses consumer deprivation concerns and provides answers to key program questions. Any such effort would have to be compatible with the applicable Minnesota regulatory framework.

Prepay electricity offers a possible additional payment option for Minnesota consumers—one that has the potential to change behavior and reduce energy consumption. We recommend that more research be conducted on this new type of program.

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Appendix A: Interviews

Interviewees

Mattias Bell, Xcel MN
Raquel Berg, Connexus
Todd Berreman, Centerpoint
Mark Brown, MyMeter
Jessica Burdette, Minnesota Department of Commerce
Elizabeth Chant, Independent Consultant
Liz Coyle, Georgia Watch
Dave Elve, PayGo
Rob Elwood, Minnesota Legal Services Advocacy Project
Pamela Ferris, Texas Ratepayers' Organization to Save Energy (ROSE)
Anthony Fryer, Minnesota Department of Commerce
Jason Grenier, Ottertail Power
Diana Hernandez, Columbia University
Ed Houn, MyMeter
John Howat, National Consumer Law Center
Kelsey Jack, Tufts University
Tina Koecher, MN Power
Bill LeBlanc, ESource
Kim O'Sullivan, Otago University (New Zealand)
Nick Mark, Centerpoint
Geoff Marke, Missouri Office of Public Council
Kristen Munsch, Citizens Utility Board of Illinois
Laura Silver, Minnesota Department of Commerce
Eddie Webster, Minnesota Valley Electric
Jamie Wimberly, Distributed Energy Finance Group (DEFG)
Cynthia Zwick, Arizona Community Action Agency (ACAA)

Interview Procedures

For each interview, we used a set interview methodology. We began the interviews by explaining the purpose of the project, funders, and project goals. We then asked each interviewee a set of predetermined questions:

1. Please describe your knowledge and/or experience with prepay electricity programs. What do you think about them generally?
2. In our report, we are aiming to paint the picture of the pros and cons of prepay programs. Could you please describe what you consider to be the benefits and what you perceive to be the concerns regarding prepay?
3. In your experience, how have you seen customers react to prepay programs?
4. What are your thoughts on using a prepaid electricity plan as a method to encourage people to save energy?
5. Are you aware of any evaluation reports on prepay pilot programs that would be useful for us to explore in our research?
6. Do you think prepay programs should be implemented at a large scale? What are the barriers that prevent prepay programs from being more widespread today?
7. *(Optional question for utilities with programs)*
 - a. If you count energy savings from your program, how do you count it? Do you use third-party evaluators? Do you have evaluation reports that you could share with us?
8. *(Optional question for Minnesota stakeholders)*
 - a. Do you think prepay is a viable option for utilities in Minnesota, either as a payment option or as an efficiency measure? What are some key considerations?
9. Do you have any final comments or thoughts you'd like to share with us?

Summary of Themes from Interviewees

We reviewed the main arguments and statements from the interviews and developed summary tables of interview themes that are more in-depth, relative to the single table presented earlier in the report. In addition to the four themes summarized in the table earlier in the report (research, customer, utility and consumer protection), these tables also include program design. We indicate in the tables the type of stakeholder that brought up each issue, but we do not attribute sentiments directly to interviewees, for confidentiality.

Table 10 summarizes themes related to the category of research.

Table 10. Summary of themes from interviewees on topic of more research needed

| Interviewee type | Main point/findings on topic of more research needed |
|-------------------------|---|
| Academic | We need more research to determine why customers are saving energy on prepaid meters and distribution impacts on rich versus poor customers. |
| Academic | It is important to collect information on self-disconnection stats to track who is being affected and how long people are without electricity (either voluntarily or nonvoluntarily). |
| Prepay advocate | Interviewees agree that we need more experiments that look at the impacts of shutoffs, financial penalties, and reward/price scenarios; prepay does clearly save energy, but we need more research to determine why this is the case. |
| Consumer advocate | Interviewees do not believe that prepay pilot programs as research are ethical. |
| Consumer advocate | Evaluations for prepay programs are not strong enough to call prepay energy efficiency. |
| Consumer advocate | We need research to determine whether shutoffs are voluntary or not, and if they are involuntary then they should not be counted as efficiency in studies. |
| Consumer advocate | We need research that breaks down savings from each measure to show what causes savings. |

Table 11 through Table 13 summarize themes related to the category of customers.

Table 11. Summary of themes from interviewees on topic of customer satisfaction

| Interviewee type | Main point/findings on topic of customer satisfaction |
|-------------------------|--|
| Consumer advocate | Customer satisfaction work is deficient; we don't see the survey questions; most in jurisdictions without bill payment programs; wants survey that asks how often people are disconnected and what that means for them, ask people if they'd want to be disconnected, and so on. |
| Consumer advocate | Interviewees want to look into customer satisfaction questions to make sure these surveys were completed objectively. |
| Consumer advocate | Interviewees mentioned customers calling into call center about positive impacts of program |
| Prepay advocate | Prepay provides customers a balance instead of bills. "No more bills! That should be the banner of prepay programs." |
| Prepay advocate | Prepay programs provide 21st-century service (rather than a second-tier service that some advocates claim it is). |

| Interviewee type | Main point/findings on topic of customer satisfaction |
|-------------------|---|
| Consumer advocate | As a consumer advocate it's hard to go against how customers say they are satisfied with the programs, but the interviewee wants to ensure consumer protections are in place. |
| Minnesota utility | The customer satisfaction element is really compelling. It provides customers with convenience and optionality. |
| Minnesota utility | They think that their customers would like it. Want to give their customers options. |
| Prepay Advocate | Frustration because some consumer advocates don't seem to believe it—customers call the utility to thank them for providing the program. |

Table 12. Summary of themes from interviewees on topic of customer control

| Interviewee type | Main point/findings on topic of customer control |
|-------------------|---|
| Prepay advocate | Prepay gives customers control over their energy use; accuses consumer advocates of eliminating choice and the ability of customers to save money and lower their anxiety about bills. |
| Consumer advocate | Prepay programs give customers feeling of control over their energy use; the number one reason customers give for liking prepay is that they have control over their energy use. |
| Prepay advocate | Prepay gives them control of their bill and surprises go away. |
| Prepay advocate | Prepay puts customers in control and helps them understand their kWh energy use. |
| Prepay advocate | Anecdotes over the past few years from customers about feeling in control and loving prepay programs; customers realize it was their fault for not paying, not the utilities fault for disconnecting them; shifting perception from utility shutting off to own fault for shutoff. |
| Minnesota utility | The customer satisfaction element is really compelling. It provides customers with convenience and optionality. |
| Academic | Research has found that customers did appreciate the increased control they had from prepay, as they could organize their finances around their energy bill using prepay; interviewees also think "forgetfulness" is a fake reason that people give for shutoffs, and it is more likely do not have the money and want to avoid stigma and shame. |

Table 13. Summary of themes from interviewees on topic of customer voluntary program

| Interviewee type | Main point/findings on topic of customer voluntary program |
|-------------------|---|
| Consumer advocate | Interviewees say many people are on prepay because they do not have a choice; agreeing to be on prepay to avoid being disconnected. |
| Prepay advocate | If customers are unhappy, they can just go back to postpay. |

| Interviewee type | Main point/findings on topic of customer voluntary program |
|-------------------|--|
| Consumer advocate | Prepay programs have a natural market, with about 20%–25% of customers saying they want to be on prepay. This isn't for senior citizens. |
| Minnesota utility | If it's an opt-in program, levels of enrollment are a concern. The utility already has a great portable for customers, so what else does prepay offer? |
| Prepay advocate | Prepay is a voluntary program with self-opt-in. |

Table 14 through Table 16 summarizes themes related to the category of utilities.

Table 14. Summary of themes from interviewees on topic of utility costs (lost revenues)

| Interviewee type | Main point/findings on topic of utility costs (lost revenues) |
|-------------------|--|
| Consumer advocate | Research can help utilities determine whether they can count prepay as EE because of lost revenue through decreased energy sales. |
| Consumer advocate | A utility can't recoup costs from this type of program, and this consumer advocate thinks it's a distraction from other programs (like home upgrades or efficiency rebates). |
| Consumer advocate | Revenue decoupling could include prepay programs, not just EE programs; this would allow prepay to not be EE while addressing this issue. |
| Prepay advocate | Some larger utilities are concerned about the revenue lost from prepay programs, if they can't count prepay as EE. |

Table 15. Summary of themes from interviewees on topic of utility savings

| Interviewee type | Main point/findings on topic of utility savings |
|-------------------|---|
| Minnesota utility | The utility doesn't end up paying for bad debt that customers can't pay. |
| Consumer advocate | It may be important to look into differences in motivations for co-ops, munis, and IOUs to run prepay programs. |
| Minnesota utility | Utilities are interested in knowing cost effectiveness. |

Table 16. Summary of themes from interviewees on topic of prepay as a utility efficiency program

| Interviewee type | Main point/findings on topic of utility efficiency program |
|-------------------|--|
| Consumer advocate | Generally, prepay programs are a payment program (like time of use) and should not be considered the same as a typical EE program. |
| Minnesota utility | It would be great if utilities could count savings from prepay. |

| Interviewee type | Main point/findings on topic of utility efficiency program |
|-------------------|--|
| Minnesota utility | The holy grail is how to not cannibalize the traditional EE offering. Asset-based programs are diminishing. The baseline is becoming higher. We need to be exploring innovation programs. |
| Consumer advocate | While prepay does lead to energy savings, nothing has proved that customers are changing their behaviors to save energy; Interviewees are unsure whether any energy efficiency education is included with prepay programs. |
| Consumer advocate | Does not think prepay should be an EE program measure. |
| Consumer advocate | Utilities need to conduct cost-benefit analysis to determine whether the costs are low and benefits high or vice versa; prepay needs to be comprehensive, but overall we need more robust research. |
| Academic | While people on prepay may use less energy, programs should couple behavioral changes with physical EE changes; sometimes people are forgoing basic needs to save money and energy—need more research. |

Table 17 through Table 19 summarize themes related to the category of consumer protection.

Table 17. Summary of themes from interviewees on topic of general consumer protection concerns

| Interviewee type | Main point/findings on topic of consumer protection concerns |
|-------------------|--|
| Consumer advocate | We need to “first do no harm” with prepay, make sure all consumer protections are in place. |
| Academic | Prepay is a good option when strong consumer protections are in place; above 12 hours regularly shut off is problematic for people (e.g., freezer defrost, pipes bursting). |
| Academic | Public health perspective: detrimental to not have electricity at home, behavioral challenges for children and child protection services. |
| Consumer advocate | Costs of communication: Who is picking up the costs of the texts for communication and other costs? Program should be less expensive for participants, not more expensive; SRP doesn't allow shutoffs at night; customers need to be able to take advantage of bill assistance programs while on prepay. |
| Minnesota Utility | We want to make sure that the right processes/mechanisms are in place for prepay to meet the requirements of consumer protections. |
| Minnesota Utility | Would like a program that is fair and equitable, and they do not want to only target low-income customers. |
| Consumer advocate | Consumer protections are in place with regulated utilities. Prepay programs often ignore consumer protections (i.e., disconnect rules). |
| Consumer advocate | In Texas, customers can split deposit payments to better afford them; utilities can find better ways to collect “uncollectables” than through prepay. |

Table 18. Summary of themes from interviewees on topic of consumer protections and disconnection as a main motivator for energy savings

| Interviewee type | Main point/findings on topic of disconnection as motivator |
|-------------------------|---|
| Academic | People will likely reduce energy without disconnections if they have feedback, but it would likely not be as effective as with disconnections. |
| Consumer advocate | Disconnection is the core issue: customers can receive feedback and other benefits on other payment methods; customers can also pay in advance now if they want to; impact of disconnection is larger than just the time customer is disconnected; also must account for other societal costs (e.g., refrigerator food loss). |
| Consumer advocate | This consumer advocate would not support prepay if it includes the threat of disconnections. |
| Minnesota utility | We would not want to run a program that has disconnect, but even without the threat of disconnect, a pay-as-you-go program would keep the customer engaged for savings. |
| Minnesota utility | What would be the motivation to save energy without a disconnect fee? |
| Consumer advocate | Advocates used to be more concerned about disconnects, but now if they have the possibility to get turned back on quickly and are given adequate warning they are not as concerned; customers need constant communication through in-home display or apps to be aware of pending disconnects |
| Consumer advocate | Customers say they are positively lowering their energy bills, taking control of energy use; consumer advocates are interested to see whether this is due to fear of shutoff or better education/feedback. |

Table 19. Summary of themes from interviewees on topic of consumer protections and equity concerns

| Interviewee type | Main point/findings on topic of consumer protections and equity concerns |
|-------------------------|---|
| Consumer advocate | When shutoff notification relies on electronic notification this can be problematic (if didn't pay utility bill may not have paid phone or Internet bill); California did not approve because of shutoff. |
| Academic | For MPower program in Arizona people frequently experienced shutoffs, didn't have many places to top-up their cars, many didn't have car so had to use public transit; stress associated with prepay, parental self-efficacy challenged, thermal comfort issues, and security and health issues. In Phoenix, housing policy is that high arrearages can affect housing stability; prepay allows people to not gain arrearage and have stable housing. |
| Academic | Race and affordable rates are issues of concern, should be correcting energy burdens, cash-based economy, top-up fees. |
| Consumer advocate | "It's baloney that they aren't targeting low-income." |

| Interviewee type | Main point/findings on topic of consumer protections and equity concerns |
|-------------------|--|
| Consumer advocate | If customers want choice, then why are programs only targeting low-income customers and not all customer classes; prepay needs to be truly free choice for low-income (not coerced into program due to high deposits or arrearages) |
| Minnesota utility | Interviewee does not want to explicitly target low-income customers but thinks it could benefit the customers —their own customer research suggests that low-income customers don't like to be surprised by their bills. They don't have the flexibility if they have a bigger bill one month. Could be a benefit rather than a stick because of the transparency. |

Table 20 through Table 24 summarize themes related to the category of utility program design.

Table 20. Summary of themes from interviewees on topic of program design and the importance of program structure

| Interviewee type | Main point/findings on topic of program design and importance of program structure |
|-------------------|--|
| Consumer advocate | The main issues with prepay depend on program structure; prepay programs need to include in-home display (with minimal cost to participants), ability to pay with cash, low or no fees for credit card payments, reduced expense (cash avoids fees), second-tier usage ability (turn off some parts of home when money is low), ability to build some arrearages during protected shutoff times; program design is key to success of the program from customer use and company perspectives. |
| Minnesota utility | For a prepay program to work well, you need a strong communications plan for customers. Need the infrastructure and process for when the prepay technology isn't working perfectly ... and it won't always work perfectly. |

Table 21. Summary of themes from interviewees on topic of program design and ideas for prepay pilots/program models

| Interviewee type | Main point/findings on topic of program design and ideas for prepay pilots/program models |
|-------------------|---|
| Academic | Consider programs with no disconnections or cheaper electricity if you pay on time or threat of price penalty if you don't. |
| Consumer advocate | Study the prepay shutoff rate compared to non-prepay program shutoff rates; don't want people to save energy from being shut off. |
| Consumer advocate | Programs could offer rewards to customers who pay in advance (instead of disconnection) or offer lower rates to those on prepay. |
| Academic | Mpower program has higher rates for prepay; most customers know this and still decide to be on prepay! |
| Consumer advocate | Rates should be lower for prepay to account for utilities receiving money before providing service. |

Table 22. Summary of themes from interviewees on topic of program design and barriers to prepay

| Interviewee type | Main point/findings on topic of program design and barriers to prepay |
|-------------------------|---|
| Prepay advocate | Utilities don't like fighting with interveners, utilities don't like altering billing software due to fears around security, and they need more evaluations like APS. |
| Prepay advocate | One roadblock is consumer advocates and regulators putting the brakes on programs; some utilities don't want to fight the battle that has been out there, some states like California had consumer advocates go to "open warfare" against prepay. |
| Minnesota utility | People need to overcome the stigma of prepay and the "sins of the past." Prepay has evolved from where it has started, but it's constantly anchored to the past. |
| Consumer advocate | Concerned about natural gas prepay programs because they are not regulated the same way as electric, may have fewer protections. |

Table 23. Summary of themes from interviewees on topic of program design and natural gas considerations

| Interviewee type | Main point/findings on topic of program design and natural gas considerations |
|-------------------------|--|
| Consumer advocate | AMI roll-out could be of concern in MN. Minnesota should talk with CAAs who administer LIHEAP and WAP and DHS to understand low-income customers in the state and how prepay could impact. |
| Minnesota utility | Not planning on rolling out AMI in the near-term. To install AMI for just prepay option does not seem feasible. Shutting off gas customers has a safety aspect concern—when the gas gets turned back on, a way must be devised to make sure pilot lights are lit again. |

Table 24. Summary of themes from interviewees on topic of program design and Minnesota-specific ideas

| Interviewee type | Main point/findings on topic of program design and Minnesota-specific ideas |
|-------------------------|--|
| Department of Commerce | Looking for a framework that can be applied to the 130 utilities, including how to best evaluate savings and what happens to people that can't pay or may have safety/comfort compromised. |
| Minnesota Utility | While this utility doesn't have AMI in place, it's planning for it in the future. They are looking for direction from the Commission. |

Appendix B: Prepay Elements That May Cause Energy Reduction

Feedback

A full discussion of the effects of feedback is presented within the body of the report, in the section Prepay Elements That May Cause Energy Reduction.

Fast Shutoff

One of the most controversial differences between prepay and postpay electricity plans is the promptness of electricity service disconnection. As we discuss in the *Prepay Considerations from Opponents and Advocates* section of this report, this is often the primary reason that utility regulators choose to disallow implementation of prepay electricity programs in the United States. Unlike postpay plans, in which consumers have several weeks to pay their bills and several more weeks of accumulating debt and interest before being disconnected, consumers on prepay plans are usually disconnected within about one day of running out of electricity credit. Although regulations usually stipulate when prepay customers cannot be disconnected (e.g., overnight or on extremely cold days), outside of these times the practice is to disconnect shortly after the customer runs out of credit.

The debate regarding whether this is good or bad for consumers (and particularly low-income consumers), and whether electricity should be bought and sold like most other products instead of paid for after use, is one that needs more exploration. We defer this debate to the *Concerns of Advocates and Opponents* section of the report and focus here on whether immediate shutoff may be an element responsible for changing participant behavior and reducing electricity use in prepay programs.

Some evaluations of prepay programs in Table 3 find that customers reduce consumption even after excluding reductions from disconnections. That is, the energy saved from disconnecting customers is not included in the overall accounting of energy reductions from prepay. The practice of excluding energy saved from so-called self-disconnections is sometimes debated because voluntarily disconnecting services may be used by some customers as a measure of controlling consumption and bills (Mummery and Reilly 2010). Regardless of whether these savings are accounted for in program evaluations, the looming threat of immediate shutoff could be enough of a motivator to encourage electricity conservation behavior.

Some of the earliest studies in psychology reveal that punishment reduces the occurrence of future behavior (e.g., Skinner 1953). Importantly, punishments will only be effective if they are meaningful to the recipient and strong enough to be noticed. The removal of electricity services is what Skinner might call a negative punishment and one that, unlike other strategies used in energy efficiency behavior change programs, is particularly meaningful and potent. Thus, at least theoretically, prepay may reduce

energy because it includes an efficient punishment mechanism for not topping up one's electricity credit.

Some evidence regarding the potency of electricity shutoff to change behavior comes from research on how low-income residents manage their finances. Interviews with 194 heads of lower-income households in Boston and Champaign-Urbana revealed that debt juggling was the most frequent strategy for managing expenses, especially among those with the lowest incomes (Tach and Greene 2014). These residents generally put off paying expenses such as bills and debts until they pose an immediate threat to well-being.

The most urgent needs come first. As one interviewee explained, "Rent comes before everything and I mean as long as my kids have food and clothes on their back and stuff, you know, I don't—I try not to stress myself out thinkin' of those things [bills] because right now at this point in time like I can't just even prioritize a bill because it's like I really have no income comin' in" (Tach and Greene 2014, p. 13). Thus, interviewees would take advantage of the ability to accumulate debt rather than pay bills to pay for other urgent needs. Without this ability to defer payment, electricity shutoff would become more urgent and consumers might be more likely to raise the importance of paying for electricity bills to avoid the punishment of reduced well-being.

O'Sullivan and colleagues (2014) found that prepay program participants prioritize electricity purchases highly (just after rent/mortgage payments) and that they are relatively good at budgeting (and even planning for seasonal changes in electricity use). Prepay forces consumers to avoid accumulating debt from unpaid bills and instead purchase electricity before using it. Whether this is good or bad for short- and long-term quality of life is discussed in the *Advocates and Opponents Concerns* section of this report. Regardless, this element of prepaid electricity plans could be one of the causes of reduced electricity consumption.

Cost

Although most American prepay programs that are currently offered or planned have similar built-in costs for prepay and postpay customers (N. Treadway, Managing Partner, DEFG, pers. comm., July 12, 2018), hidden costs can still make prepay slightly more expensive in some cases. For example, Salt River Project's M-Power program—the most well-documented US prepaid electricity program, available to customers in Phoenix, Arizona—has similar electricity rates for prepay and postpay plans and requires a smaller deposit for activating prepay service than for postpay, but 40% of any prepay top-up payments must go to paying down arrears (EPRI 2010). Although this may be a benefit, given that many consumers who switch to prepay owe arrears, a large proportion of prepay customers had to pay more to get the same amount of electricity (because the first 40% went to paying down arrears). This reduction of access to electricity could have impacted their disconnection rates and electricity usage.

Similarly, some programs ask participants to pay a small fee for adding credit at a kiosk, by a third-party vendor (e.g., by credit card or check), or over the phone (Howat and McLaughlin 2012). Although these transaction fees may be identical to postpay fees, they are cumulatively higher for prepay consumers

because prepay consumers are likely to engage in a larger number of transactions (Howat and McLaughlin 2012).

In South Africa, although program fees were identical between prepay and postpay and debt repayment was not required for most customers on prepay, some customers were moved onto a higher electricity rate for about three months after installation of prepay meters, and this could account for a small percentage of the savings from the program (Jack and Smith 2016).

Low-income prepay customers have, in some studies, expressed willingness to accept the higher costs of prepay programs because they believe the benefits outweigh these costs (e.g., O'Sullivan et al. 2013), but these costs may influence behavior. Traditional economic theory explains that when costs rise, consumption decreases. We would be interested to see whether prepay programs reduce energy consumption in countries such as Bangladesh or Northern Ireland, where prepaid electricity costs are lower than postpay costs.

Usually Frequent Payment

One way to encourage behavior is to make the opportunity to act more convenient or make the converse action less convenient. For example, stair use can be encouraged by slowing elevator doors or situating the stairs within line of sight of the elevator (Van Houten, Nau, and Merrigan 1981; Bungum et al. 2007). Recycling is more likely when the recycling bin is beside the garbage bin, close to where consumption of recyclable goods occurs (e.g., Ludwig, Gray, and Rowell 1998). The effort required to pay for electricity could affect its use.

Prepay customers generally pay for electricity with smaller and more-frequent payments. In itself, this could increase the chances of missing a payment by chance. If a program also requires an inconvenient method of payment, then this effect is multiplied. For example, the Salt River Project evaluation was conducted at a time during which participants had to travel an average of two to three miles to a kiosk to purchase electricity credits (Qiu, Xing, and Wang 2016). Given that they purchased credits an average of three to four times per month, this small but significant burden may have influenced consumption (and disconnection rates, which were not accounted for) in this evaluation.

Modern American prepay programs are based on smart meters and often offer payment options that are more convenient than those for many postpay programs (e.g., the ability to top-up credit by phone app at any time for any amount). DEFG's market research shows that convenience is among the top reasons that potential consumers are interested in adopting modern prepay plans. These newer programs and the element of convenience/inconvenience should be evaluated. Whether electricity savings remain equally high for programs with convenient payment options would be interesting to see.

Active Payment

Individuals who must actively decide how much credit to add to their electricity account may subsequently pay more attention to the electricity they are using. Most prepay customers purchase electricity credits 3 to 9.5 times as frequently (3 to 9.5 times per month, depending on the program) as postpay customers pay their bills (Qiu, Xing, and Wang 2016; Jack and Smith 2016). These participants choose when to load credit onto their accounts and how much to load. This increased attention and decision making may subsequently lead participants to pay more attention to how much electricity they are using.

Evidence of the process of active decision making to change behavior can be found in studies of 401(k) deposits (Carroll et al. 2009). New employees who are forced to choose whether to enroll in a 401(k) savings plan upon being hired are significantly more likely to enroll (28% more likely) than those who are not forced to choose one of the two options. They then make higher savings contributions and save more money. Without active decision making, many employees procrastinate and make poor financial planning decisions by default.

Active decision making as a potential influence on the behavior of prepay program participants should be studied directly within a North American context. One report on Chinese prepay programs found, surprisingly, that customers on autopay did not use significantly more electricity than those on prepay, but the authors used a bottom-up estimation of energy use as opposed to actual monthly billing data (Du, Guo, and Wei 2017). The Chinese context is also different from the modern American context for several reasons. Among other things, many residents in rural China do not have electricity, and 54% of customers still pay their bills at the counter of the electricity company. They thus engage with their bills more deeply than North American consumers who, if not using autopay, tend to pay online or over the phone. Although active payment may account for only a small proportion of the effect of prepay programs, this potential influence on behavior should be tested.

Paying in Advance

One final required aspect of prepay electricity programs is that consumers must pay for their power in advance of receiving it. This characteristic of prepay programs may increase the attention and concern that consumers pay to their usage. Consumers that delay payment for electricity are using credit to pay their bills. Classical economics research finds that consumption tends to increase as access to credit increases (Ludvigson 1999), and people are willing to pay more for goods using a credit card than using cash (Prelec and Simester 2001). Similarly, restaurant-goers leave larger tips using credit cards than using cash (Feinberg 1986). This increase in spending using credit cards is partly explained by access to credit (Ludvigson 1999) and partly by other mental processes that are not entirely clear (Prelec and Simester 2001).

Loading up prepay meters in advance of using the electricity is like the process of getting cash from the bank before spending it. Conversely, paying for electricity after using it is similar to spending credit and

then paying the balance later. The same mechanism that works to reduce spending with cash may also work to reduce spending on electricity for prepay program participants. Although this effect may be limited, it is an important potential mechanism to test because it is the most fundamental to prepaid electricity plans (and strongly differentiates them from postpay plans).

In line with the results of several studies (e.g., APS 2015, Jack and Smith 2016), this effect may be most pointed for low-income customers. At least one study suggests that people with less money continue thinking about the costs of products, even after buying them, whereas wealthy people only think of those costs at the time of purchase (Shah et al. 2018). For wealthy people, consuming a product that was paid for in the past is like consuming something “for free,” whereas for people without money, the cost of the product is considered every time it is consumed. Thus we might expect that paying in advance for electricity would reduce consumption among people without money more than among those who are wealthy.

Appendix C: State Regulatory Orders/Actions Regarding Prepay

CALIFORNIA (SDG&E 2014)

In 2014 the California Public Utilities Commission (CPUC) ruled on a March 2012 proposal for a prepay program from San Diego Gas & Electric (SDG&E) that they claimed would have several benefits, including “potential energy savings.” The prepay program was opposed by several parties, including the Office of Ratepayer Advocates (ORA), The Utility Reform Network (TURN), the National Consumer Law Center (NCLC), and so on. The CPUC ruled that it did not find the proposed program to be in the public interest, apparently on ratepayer protection grounds relating to advance notice to customers about shutoffs. The issue of energy savings did not appear to be a material factor in the decision. The commission noted that it was not foreclosing the ability of the utility to propose a prepay program in the future (although we find no evidence of any prepay program being subsequently approved).

[Decision 14-01-002, January 16, 2014]

KANSAS (Westar 2016)

In 2014 Westar implemented a two-year prepay pilot program. In November 2016 Westar applied to convert the pilot into a permanent program and remove the participation limit. Westar cited as a benefit of the program that it had collected over \$300,000 in arrears from customers in the program. (We did not see any mention of energy efficiency or energy savings as an issue in the order summary.) Commission staff and a consumer group (Citizens’ Utility Ratepayer Board; CURB) filed opposition to the proposal, claiming that the company had not provided any cost-benefit analysis and that the per-customer program costs were high (e.g., \$850 to \$1,040, depending upon what was included). The commission agreed that Westar had not presented a sufficient record to justify making the program permanent, so they denied Westar’s request and gave them six months to transition current participants off the program.

[Docket No. 14-WSEE-148-TAR, December 15, 2016]

MISSOURI (2017)

In November 2017 Ameren Missouri filed an application to have a prepay pilot program approved. The proposal was opposed by commission staff as well as by the Missouri Office of Public Counsel (OPC), who argued that the program was not cost effective and would not meet the definition of an energy efficiency program under Missouri statute. In April 2018 Ameren withdrew its proposal.

[Case No. EO-2015-055]

The OPC informed us that in the recent rulemaking for the Missouri Energy Efficiency Investment Act, the definition of *demand-side programs* was updated to specifically exclude “deprivation of service” as an eligible component (Rule 4 CSR 240.20.093(1)M). This reportedly was done specifically in response to concerns about prepay.

[G. Marke, Chief Economist, Missouri Office of the Public Counsel, pers. comm., July 20, 2017]

NORTH CAROLINA (Progress Energy Carolinas 2012)

In February 2012 Progress Energy Carolinas (PEC) filed a request for approval of a prepay pilot program as an energy efficiency program. The commission noted that the utility had conducted a prepay pilot in 2001 and that the utility itself had concluded that the program was not cost effective and closed the program in 2002. For the current application, the commission concluded: “PEC has not provided sufficient information to persuade the Commission that the prepay pilot could ultimately lead to a cost-effective energy efficiency program” and denied the application.

[Docket No. E-2, sub 1011, June 13, 2012]

North Carolina Update (2018).

In January 2018 Duke Energy Carolinas filed for approval of a “Prepaid Advantage Energy Efficiency Pilot Program.” Commission staff recommended disapproval of the request in a filing on April 16. Staff was supportive of some of the proposed technical capabilities being broadly available to customers but opposed categorizing prepay as an energy efficiency program. Among their concerns, an April 17 *Utility Dive* article reported: “Staff said if the program were approved, Duke would have recovered its costs in a rider proceeding and receive a bonus utility incentive, plus a net lost revenue incentive, from all customers” (Walton 2018). While disagreeing that such treatment was appropriate, staff did say in their filing: “The billing and data usage components of the Prepaid Pilot are basic functionalities of AMI meters and should not be the basis of an EE program. Customers should receive the full benefits of AMI meter functionality, including the prepaid billing option, as part of normal electric service provided under base rates” (p. 6). They went on to say: “Staff would encourage the Company to request approval from the Commission to offer a prepay billing option that is not presented as a DSM/EE program” (p. 7).

On April 26 the company requested to withdraw its application for the prepay pilot program, and on June 15 the commission issued an order granting the withdrawal.

[Docket No. E-7, SUB 1167]

OHIO (Duke Energy Ohio 2010)

In December 2009 Duke Energy Ohio proposed a \$2.7 million prepay program as one of 10 proposed programs for their energy efficiency portfolio. The Ohio Partners for Affordable Energy (OPAE) argued against approval, saying that the program was not energy efficiency. In December 2010 the commission denied approval for the prepay program, saying that the utility had not provided adequate information to support implementation. The commission stated the company needed to provide more detailed information, “including but not limited to, the potential for any consumer benefits and any ancillary benefits that may accrue to Duke as a result of this program.” The other nine proposed energy efficiency programs were all approved.

[Case No. 09-1999-EL-POR]

PENNSYLVANIA (PECO 2018)

In October 2016 PECO filed an application to conduct a prepay pilot program, including a waiver of several typical ratepayer protections regarding billing and shutoffs. The expressed objectives of the

company were to (1) assess customer adoption and whether it increases customer satisfaction to have an alternative available; (2) collect data of customer usage and payment patterns; (3) assess whether the plan affects reduction and avoidance of delinquencies; (4) assess whether the plan assists in energy conservation. Several ratepayer advocate groups intervened and opposed the proposal.

On March 6, 2018, the administrative law judge (ALJ) issued a proposed decision for the commission to consider. The ALJ recommended denying the proposal on a number of grounds, most relating to various ratepayer protections regarding shutoffs and so forth. The ALJ noted that “some of the problems can be resolved by not including as potential participants households under 300% of the FPL. However, this modification does not cure all of the deficiencies that I found problematic” (p. 79). Among the findings of fact was the statement that “Reduced usage from prepayment is not necessarily conservation as it could also be deprivation through forced usage reduction” (p. 21).

[Recommended Decision, P-2016-2573023, March 6, 2018]

ARIZONA (Arizona Public Service [APS] 2015)

In March 2015 APS filed for approval to continue its 2013 DSM plan through 2015 and going forward, including transitioning its pilot prepay program into a fully implemented DSM program. The pilot had been approved in July 2012, with a maximum of 2,000 customers. Staff recommended that the program remain a pilot until certain operational and scalability concerns were resolved. The Southwest Energy Efficiency Project (SWEET) intervened and said the program should only be continued if the energy efficiency education and communication aspects were improved, and that any energy savings needed to be better documented by an independent study that was fully reviewed by the commission and a stakeholder group.

In November 2015 the commission ordered that the prepay program would stay as a pilot program, that APS shall discontinue the pilot program by December 2016, and that APS “shall work with stakeholders to collaborate on ways to enhance the education and communication offerings for potential future prepaid programs in order to increase program effectiveness to ensure that customers fully understand the program and their options for how to reduce their energy bills and also to ensure the energy savings due to the education and communication offerings are documented in a reliable manner” (p. 16).

[Docket No. E-01345A-15-0095, November 25, 2015]

(The APS prepay program is currently categorized as “suspended.”)

Appendix D: Recommendations to Address Consumer Concerns

Consumer advocate groups make several suggestions to reduce the likelihood of negative quality-of-life outcomes from prepaid electricity programs (NASUCA 2011; Howat and McLaughlin 2012). Following are the suggestions of National Association of State Utility Consumer Advocates (NASUCA 2011) that were echoed the following year by the National Consumer Law Center (Howat and McLaughlin 2012).

These recommendations were made six years ago and most have been addressed in modern prepaid electricity proposals. If programs met all these requirements, they would almost certainly avoid deprivation, but they may also become less appealing to utilities in Minnesota and possibly less effective as energy efficiency programs (because they remove some of the elements that potentially cause behavior change and ensure utility revenues). We present these not as requirements, but as suggestions to consider.

- All regulatory consumer protections and programs regarding disconnection limitations or prohibitions, advanced notice of disconnection, premise visits, availability of payment plans or deferred payment agreements, availability of bill payment assistance or arrearage forgiveness, and billing disputes are maintained or enhanced
- If the billing credits of a customer receiving prepaid residential electric or natural gas service are exhausted, the customer shall be given a reasonable disconnection grace period, after which the customer shall revert to traditional, credit-based service, subject to all rules and customer protections applicable to such service
- Prepayment households include no one who is income-eligible to participate in the federal Low-Income Home Energy Assistance Program (LIHEAP) or protected under state law from disconnection for health or safety reasons
- Prepaid service is marketed only as a purely voluntary service and is not marketed to customers facing imminent disconnection for nonpayment
- Utilities offering prepaid service also offer effective bill payment assistance and arrearage management programs for all customers, including customers with arrearages who choose prepayment service
- Rates for prepaid service are lower than rates for comparable credit-based service, reflecting the lower costs associated with reduced cash working capital requirements, uncollectible amounts, and shareholder risk affecting a utility's return on equity
- Utilities demonstrate the cost effectiveness of any proposed prepaid service offerings through a cost versus benefit analysis and reveal how costs will be allocated among various classes of customers

Appendix D: Recommendations to Address Consumer Concerns

- Prepayment customers are not subjected to any security deposits or to additional fees of any kind, including but not limited to initiation fees or extra fees assessed at any time customers purchase credits
- Utilities ensure means are readily available for prepayment customers to purchase service credits on a 24-hour-a-day, seven-day-a-week basis
- Prepayment customers can return to credit-based service at no higher cost than the cost at which new customers can obtain service
- Payments to prepaid accounts are promptly posted to a customer's account to prevent disconnection or other action adverse to the customer under circumstances in which the customer has in fact made payment
- Adequate financial mechanisms are developed and in place within the state to guarantee that funds prepaid by customers are returned to the customers who prepaid them when a company becomes insolvent, goes out of business, or is otherwise unable to provide the services for which the funds were prepaid

Some of the consumer protection policies have been successfully demonstrated by other countries (Esteves et al. 2016). In some countries, such as Bangladesh and Ireland, utilities are required by law to give prepay customers a 2% discount on their electricity rates. In Colombia, the utility may ask for part of prepay top-up credits to go toward paying outstanding arrearages, but this may only be a maximum of 10% of their top-up (some US programs are allowed to require up to 40% to be debt repayment). However those Columbian utilities can also force consumers to switch to prepay if they fail to pay their electricity bill for two cycles.

Appendix E: Detailed Assessment of Evaluations

Program: Arizona Public Service, Arizona

Reference: Demand Side Management Residential Prepaid Energy Conservation Pilot Program: End of Pilot Report; Authors or organizations: Arizona Public Service (APS); Date: February 13, 2015; Source: APS

Quality: Acceptable. The methodology and duration were reasonable, and the report was transparent. However the final analysis was conducted on a small sample, and the number of months that customers were followed was not clear. The evaluation is commended for excluding customer disconnections from savings estimates and providing a detailed analysis of customer disconnections. This is also the only evaluation we found that included a cost-benefit analysis.

Program duration at time of evaluation: Some months before prepay, ~12–16 months with prepay

Electricity savings: 7.5%

Calculation of savings controls for disconnects: Yes

Costs, compared to postpay: Higher. This is because of third-party vendor fees (at kiosk and for online credit card). No reconnection fees, access fees. kWh rates are the same.

Notes: Difference-in-difference regression analysis was conducted with 86 pairs (out of 610 with pre-post data). After controlling for disconnects, found 7.5% savings. Without controlling for disconnects, the authors found 7.6% savings. Savings was driven by low-income consumers, but this may have been partly due to lack of a sufficient number of mid- and high-income participants to find a reliable result.

Number of participants: 86 in each group (prepay and control)

Evaluation design: Pre-post and matched control (difference-in-difference analysis)

Year of publication: 2015

Program: Direct Energy, Texas

Reference: Eryilmaz, D., and S. Gafford. 2018. "Can a Daily Electricity Bill Unlock Energy Efficiency? Evidence from Texas." *The Electricity Journal* 31 (3): 7–11.
www.sciencedirect.com/science/article/pii/S1040619018300666.

Quality: Acceptable. The results are published in a peer-reviewed journal, but the method by which the control group was selected is questionable. A nonmatched control group may create a selection bias that was not adequately controlled using their statistical approach. The sample size and relative costs of prepay compared to non-prepay are not transparent. They are commended for excluding savings from customer disconnections.

Program duration at time of evaluation: Three years with prepay

Electricity savings: 9.6%

Calculation of savings controls for disconnects: Yes

Costs, compared to postpay: Similar. No deposit. No transaction fees. No late fees. No reconnection fees. No debt repayment requirement. Possibly slightly higher average kWh rates than postpay.

Notes: The program had a slightly different type of approach to prepay than other programs. Customers received daily bills reflecting their usage from two days prior, and this bill was automatically deducted from preloaded credit. Customers received the bill at 8 AM and were shut off at 10 AM if they had insufficient credit. Some customers qualified for low-income electricity subsidies. Nonsubsidized electricity customers saved more electricity than subsidized customers (0.92%–6.79% versus 9.58%–13.21%).

Number of participants: Unclear. The authors stated that they had "over 20,000 customer years" in each study group. However the exact number is not disclosed. One would estimate an average of approximately 6,700 customers each year (given the three-year duration), but the exact number included in the final analysis is not presented.

Evaluation design: Nonmatched control group. Attempted to control for selection bias statistically using the "instrumental variable approach." However the selection of the instrumental variable was not sufficient to rule out potential bias.

Year published: 2018

Program: Duke Energy Carolinas, North and South Carolina

Reference: Duke Energy Carolinas Prepaid Advantage Pilot Earnings Report; Authors or organizations: Duke Energy Carolinas; Date: August 15, 2017; Source: Docket No. 2015-136-E, South Carolina PSC North and South Carolina

Quality: Acceptable. The methodology and duration were reasonable, and the report was transparent. However the final analysis was conducted on a small sample, which could be the reason for the non-statistically significant savings. The evaluation did not exclude customer disconnections from savings estimates.

Program duration at time of evaluation: Two years with prepay

Electricity savings: Not statistically significant

Calculation of savings controls for disconnects: No

Costs, compared to postpay: Higher. This is because of third-party vendor fees (credit card charge if more than two payments/month) and because the first 25% of top-ups goes to debt repayment (leaving less money for customers to purchase electricity). Late fees may apply (not clear). No monthly access fees. kWh rates are the same.

Notes: Due to undescribed data analysis problems, only 74 homes were included in the analysis, and the observed average reduction of 8.6% was not statistically significant.

Number of participants: 74 in each group (prepay and control)

Evaluation design: Matched control group (post analysis only)

Year published: 2017

Program: Eskom, Cape Town, South Africa

Reference: Jack, B. K., and G. Smith. 2016. Charging Ahead: Prepaid Electricity Metering in South Africa (No. w22895). National Bureau of Economic Research. <http://www.nber.org/papers/w22895>.

Quality: Acceptable. The evaluation included all relevant information, used a large sample size, and was of sufficient study duration. The evaluation studied only customers who were enrolled in prepay involuntarily and therefore eliminated self-selection bias. It also observed 27 separate groups of prepay transitions (from prepay to postpay) to determine results. It did not include a control group, but these other elements nevertheless creatively compensated some of the bias created by using a nonexperimental method.

Program duration at time of evaluation: ~16 months with prepay (plus ~38 months before prepay)

Electricity savings: 13%

Calculation of savings controls for disconnects: No

Costs, compared to postpay: Possibly slightly higher for some. Rates and fees were the same, but customers who were on "lifeline tariff" before prepay were moved to the more expensive "domestic tariff" after switching to prepay. This lasted an average of three months (sometimes permanently). No third-party vendor fees or kiosk fees.

Notes: The program targeted regions with low property values and therefore cannot be generalized outside these areas of South Africa. Authors observed the largest reductions in energy use for high-baseline energy consumers and those with frequently delinquent payments.

Number of participants: 4,246 (no control group)

Evaluation design: Compared usage for 27 groups of customers before and after prepay (pre-post)

Year published: 2016

Program: Glacier Electric Cooperative, Montana; Pacific Northwest PenLight, Washington

Reference: Prepay Energy Conservation Impact Study; Prepared by DEFG for the Northwest Energy Efficiency Alliance, 2014.

Quality: Acceptable or limited. The methodology was reasonable although the studies lacked control groups and were somewhat short. The PenLight subgroup was small and used only a pre-post comparison. The report also lacked detail on relative costs and convenience of prepay compared to postpay plans. However evaluations are commended for excluding customer disconnections from savings estimates and for surveying customers regarding their actual behavior change. This is the only American study to do so.

Program duration at time of evaluation: Glacier ~9 months (including some months before prepay and some with prepay); PenLight ~13 months (including some months before prepay and some with prepay)

Electricity savings: 14%; 5.5%

Calculation of savings controls for disconnects: Yes, but the procedure is debated. The Glacier Electric evaluation attempted to account for disconnections in the regression analysis but may do so in a less-than-optimal way. The authors include separate variables for disconnections and prepaid metering, plus an interaction of the two. They interpret the effect of prepaid only to be independent of the effect of disconnections on consumption because the regression also includes disconnections. However prepaid metering also has a causal effect on disconnections. If the disconnection variable were categorical, then the approach could generate an interpretation that the prepaid coefficient is the effect of prepaid metering among the group of customers with zero disconnections. However the groups differ by meter type and therefore prepaid metering affects disconnections. This means that the interpretation may be suboptimal (K. Jack, Assistant Professor of Economics, Tufts University, pers. comm., August 14, 2018). The authors also disclose that allowing electricity to be disconnected was a strong potential factor for reducing electricity in the prepay group.

Costs, compared to postpay: Not available in either case

Notes: Surveys revealed that customers engaged in a number of behaviors to reduce their electricity use. The behaviors that appeared to have the most impact were upgrading or changing the thermostat and allowing the electricity to be remotely shut off. They also found that customers on prepay who used more electricity were disconnected more frequently (the opposite of what occurs for postpay customers).

Number of participants: Glacier 1,240; PenLight 154

Evaluation design: Pre-post (no control group)

Year: 2014

Program: Oklahoma Electric Cooperative, Oklahoma

Reference: The Effect of Prepayment on Energy Use; By Michael Ozog, PhD, Integral Analytics. A research Project Commissioned by DEFG Prepay Energy Working group. March 2013.
defgllc.com/publication/the-effect-of-prepayment-on-energy-use/.

Quality: Acceptable. The methodology, sample size, and duration were reasonable, and the report was transparent. The evaluation is commended for excluding customer disconnections from savings estimates. The evaluation is one of few that investigated the duration of customer disconnections. However the study did not include a control group, and some cost information was difficult to find.

Program duration at time of evaluation: ~32 months before prepay, ~22 months with prepay

Electricity savings: 10.4%

Calculation of savings controls for disconnects: Yes, but the procedure is debated. See Glacier and PenLight evaluations for details.

Costs, compared to postpay: Higher. Possible monthly vendor fee. Possibly higher rates during pilot program. Some third-party vendor fees (charge for check or credit card). No late fees. Debt repayment is optional.

Notes: When consumer disconnects are not controlled for, savings is 11%. Ninety-one percent of customer disconnections lasted no more than one day. Of those, one-third (32%) lasted one hour. However 4% of disconnects lasted over three days.

Number of participants: 1,217

Evaluation design: Pre-post (no control group)

Year: 2013

Program: Salt River Project M-Power program 2008–2009, Arizona

Reference: Qiu, Y, B. Xing, and Y. D. Wang. 2016. “Prepaid Electricity Plan and Electricity Consumption Behavior.” *Contemporary Economic Policy* 35 (1): 125–142.

Quality: Acceptable. The evaluation included all relevant information, used a large sample size, and was of sufficient study duration. The evaluation was transparent and clearly explained the matching procedure for control participants. It used a pre-post evaluation in combination with a matched control group. The study clearly laid out sufficient detail to allow readers to understand the limitations of the study (that the prepay group paid higher costs and had less-convenient payment options). The study was published in a peer-reviewed journal.

Program duration at time of evaluation: One year before prepay, one year with prepay

Electricity savings: 12%

Calculation of savings controls for disconnects: No

Costs, compared to postpay: Higher. This is because the first 35% to 40% of top-up payments went to debt repayment (as determined from other sources) and because other rates and fees were higher. Thus customers would have fewer funds to purchase electricity credits. Costs include a one-time service establishment fee, a deposit for the prepay meter, reconnection fees, and higher rates than postpay.

Notes: The biggest savers were those with lowest income and most arrearages. Savings were higher in the summer. Payment required an in-person trip to a payment kiosk. Trips were made an average of three to four times per month. The increased effort required for making multiple trips per month to the kiosk could have partly explained the savings from this program.

Number of participants: 1,641 in each group (prepay and control)

Evaluation design: Pre-post and matched control (difference-in-difference analysis)

Year: 2016

Program: Kentucky Association of Electric Cooperatives, Kentucky

Reference: Martin, W. M. 2014. "Pay-as-You-Go Electricity: The Impact of Prepay Programs on Electricity Consumption" (master's thesis, University of Kentucky). william.martin24@uky.edu; uknowledge.uky.edu/do/search/?q=William%20Martin%20&start=0&context=1737482&facet=publication_year%3A2014#.

Quality: Acceptable. The evaluation included all relevant information, used a reasonable sample size, and was of sufficient study duration. The evaluation was transparent and clearly explained the details of the prepay and postpay plans, allowing readers to understand the limitations of the study (that the prepay group paid higher costs). However the author did not attempt a difference-in-difference analysis because he had access to only a nonmatched comparison group and did not include details of payment options (i.e., convenience) for both groups. The author also did not calculate savings separately for each utility and did not enumerate all the costs to customers. The study was conducted as part of a master's thesis and, as such, underwent some degree of peer review.

Program duration at time of evaluation: ~One year prepay (and up to three years before prepay)

Electricity savings: 11.1%

Calculation of savings controls for disconnects: No

Costs, compared to postpay: Higher. This is because of monthly vendor fee and transaction fees for one of the two utilities. Third-party vendor fees and debt repayment requirement were possible. kWh rates were similar to postpay and no late fees.

Notes: The savings were calculated as a pooled analysis of two electric co-ops (Bluegrass and Jackson). More savings were found during hot or cold days than mild days. Consumers saved less over time in the program.

Number of participants: 574

Evaluation design: Pre-post (no control group)

Year: 2014

Program: Salt River Project 2003–2006, Arizona

Reference: Paying Upfront: A Review of Salt River Project's M-Power Prepaid Program; Authors or organizations: EPRI; Date: October 2010; Source: EPRI

Quality: Limited. The evaluation was not conducted by a third-party evaluator, and the report lacked sufficient detail to assess its quality. The report discusses three studies: one covering 2002–03 program year, one for 2003–04, and one for 2005–06. Details are available only for the 2005–06 study, in which they found 12% savings. In the first two years, the report cites average savings of 11% and 13%, respectively (but provides no details for control group or matching criteria).

Program duration at time of evaluation: One year before prepay, one year with prepay for 2005–06 section of evaluation

Electricity savings: 12%

Calculation of savings controls for disconnects: No

Costs, compared to postpay: Higher. This is because the first 40% of top-up payments went to debt repayment (as mentioned in the report) and because other rates and fees were higher. Thus customers were left with fewer funds with which to purchase electricity. Costs include a one-time service establishment fee, a deposit for the prepay meter, reconnection fees, and higher rates than postpay.

Notes: The 12% savings comprises an 8% reduction by participants and a 4% increase by the comparison group. Payment required an in-person trip to a payment kiosk. Trips were made an average of three to four times per month. The increased effort required for making multiple trips per month to the kiosk could have partly explained the savings from this program.

Number of participants: 463 in each group (prepay and control)

Evaluation design: Pre-post and matched control (difference-in-difference analysis)

Year: 2010

Program: TVA utilities, Tennessee

Reference: Prepaid Metering Program Study in the Tennessee Valley: Measuring the Change in Energy Consumption (PowerPoint presentation); Authors or organizations: DNV GL; Date: 2016; Source: Unknown

Quality: Limited. The information for these six utility prepay programs comes from a summary provided in a PowerPoint presentation. Although the evaluation was conducted by a third-party evaluator, the report was not made public, and thus detail was insufficient to assess the quality of the evaluation. The utility names were made anonymous in the report. The evaluation periods were short, and in some cases, the programs had small sample sizes. Although matched control groups were included, the size of these groups and criteria for matching are unknown. Whether evaluators excluded savings from disconnections in their savings estimates is not indicated.

Program duration at time of evaluation: ~One year with prepay

Electricity savings: 5.6%; 6.7%; 5%; 6.9%; 11.7%; 6.8%

Calculation of savings controls for disconnects: No

Costs, compared to postpay: Unclear. The PowerPoint presentation has insufficient detail. A monthly access charge appears to be required. The utilities may have charged third-party vendor fees (e.g., at kiosk) or reconnection fees. However the kWh rates are the same.

Notes: For most programs, savings were higher in the winter and for high-baseline electricity customers. One program found savings to be slightly higher in low-baseline electricity customers. The authors note that the one program that had significantly higher savings than the others (11.7%) is an aberration and that they expected savings to decrease as the program matures.

Number of participants: 350 prepay customers; 184 prepay customers; 201 prepay customers; 183 prepay customers; 145 prepay customers; 76 prepay customers

Evaluation design: Matched control group

Year: 2016

DTE Electric Company
One Energy Plaza, 1650 WCB
Detroit, MI 48226-1279



Carlton D. Watson
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December 17, 2021

Joel B. King
Assistant Attorney General
Special Litigation Division
6th Floor Williams Bldg.
525 W. Ottawa Street
Lansing, MI 48909

Re: In the matter of the Application of DTE ELECTRIC COMPANY for approval of a partial waiver of the Consumers Standards and Billing Practices for Electric Residential Service and approval of a Voluntary Prepay Billing Program
MPSC Case No. U-21087

Dear Mr. King:

Attached for electronic filing in the above-captioned matter is DTE Electric Company's Response to Michigan Attorney General and Citizen's Utility Board of Michigan's First Discovery Request. Also is attached is a Proof of Service.

Very truly yours,
**Carlton D.
Watson**  Digitally signed by
Carlton D. Watson
Date: 2021.12.17
11:50:16 -05'00'
Carlton D. Watson

CDW/erb
Attachments
cc: Service List

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.1a
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that Prepay will provide participating customers with “visibility into, and a greater sense of control over, their energy usage and how much they spend.” (MJH 5: 20-22)

a. Please explain how Prepay gives customers greater visibility and control into their energy usage and costs than providing similar information to post-pay customers. Please cite and provide any empirical evidence or third-party research supporting your answer.

Answer: The Company maintains that it has articulated in its testimony in the instant case the differences between prepay and post-pay billing, and how the design and elements of prepay billing benefits customers who choose to voluntarily enroll in the program.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.2ai
Respondent: M. Hatsios / Legal
Page: 1 of 1

Question: Witness Hatsios describes “daily balance updates, low balance alerts, and easy payment options...” that Prepay customers will receive (MJH 29:16-17)

- a. Has the Company used any of these communication methods and data to give post-pay customers greater visibility into, and control over, their energy usage and costs? Please describe what information is/was provided, with what frequency, and via what communication channels.
- i. For any such data provided to post-pay customers and communication methods used, please describe quantitatively and qualitatively any differences in customer energy usage and costs that have been observed before and after customers received this information.

Answer: DTE Electric objects for the reason that the information requested is not relevant, nor is it reasonably calculated to lead to the discovery of admissible evidence. Subject to this objection, and without waiving this objection, to provide customers with increased visibility into their monthly usage and cost, the Company today sends out high usage alert emails to customers with AMI meters whose current bill is projected to be 20-150% higher than the same period last year. These alerts are intended to alert customers to the potential for a higher bill and to increase their awareness of ideas to reduce their energy consumption. The Company does not have any data related to the impact of these alerts on customer usage.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.2aii
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios describes “daily balance updates, low balance alerts, and easy payment options...” that Prepay customers will receive (MJH 29:16-17)

- a. Has the Company used any of these communication methods and data to give post-pay customers greater visibility into, and control over, their energy usage and costs? Please describe what information is/was provided, with what frequency, and via what communication channels.
- ii. For any such data provided to post-pay customers and communication methods used, please describe quantitatively and qualitatively energy usage and cost differences between these customers and customers who did not receive such communications and data.

Answer: This question is a duplicate of AGCUBDE-1.2ai

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.2aiii1
Respondent: M. Hatsios / Legal
Page: 1 of 1

Question: Witness Hatsios describes “daily balance updates, low balance alerts, and easy payment options...” that Prepay customers will receive (MJH 29:16-17)

- a. Has the Company used any of these communication methods and data to give post-pay customers greater visibility into, and control over, their energy usage and costs? Please describe what information is/was provided, with what frequency, and via what communication channels.
- iii. If the Company has not used any of these communication methods with post-pay customers,
- 1. Does the Company have any empirical data, or access to third- party research, showing that the communication methods and data intended to give customers greater visibility into their energy usage and costs will have greater impact or benefit for Prepay than for post-pay customers? Please provide any such data or research.

Answer: DTE Electric objects for the reason that the information requested is not relevant, nor is it reasonably calculated to lead to the discovery of admissible evidence. Subject to this objection, and without waiving this objection, outside of the previously mentioned high usage alerts (see my response to AGCUBDE-1.2ai), the Company’s post-pay customers do not receive the same communications intended for PrePay customers, and as such, the Company does not have any empirical data related to the benefits that a post-pay customer would expect from such communications.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.2aiii2
Respondent: M. Hatsios /Legal
Page: 1 of 1

Question: Witness Hatsios describes “daily balance updates, low balance alerts, and easy payment options...” that Prepay customers will receive (MJH 29:16-17)

a. Has the Company used any of these communication methods and data to give post-pay customers greater visibility into, and control over, their energy usage and costs? Please describe what information is/was provided, with what frequency, and via what communication channels.

iii. If the Company has not used any of these communication methods with post-pay customers,

2. Are there any different technical, logistical or other management obstacles to providing the same information and using the same communication methods for post-pay customers as for Prepay? Please describe.

Answer: DTE Electric objects for the reason that the information requested is not relevant, nor is it reasonably calculated to lead to the discovery of admissible evidence. Subject to this objection, and without waiving this objection, no, today post-pay customers receive email and text messages from the Company for a variety of reasons.

While the Company could provide post-pay customers with daily usage notifications, and does so via for customers who download and use the DTE Insight App, the billing system does not calculate daily energy charges.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.2aiii3
Respondent: M. Hatsios / Legal
Page: 1 of 1

Question: Witness Hatsios describes “daily balance updates, low balance alerts, and easy payment options...” that Prepay customers will receive (MJH 29:16-17)

a. Has the Company used any of these communication methods and data to give post-pay customers greater visibility into, and control over, their energy usage and costs? Please describe what information is/was provided, with what frequency, and via what communication channels

iii. If the Company has not used any of these communication methods with post-pay customers,

3. Are there any regulatory or legal obstacles to providing the same information and using the same communication methods for post-pay customers as for Prepay? Please describe.

Answer: DTE Electric objects to this request to the extent that it seeks a legal conclusion from a lay witness. Subject to this objection, and without waiving this objection, not to the best of my knowledge.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.3ai
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that Prepay gives customers the ability to pay what they want, when they want. (MJH 5:22-24)

- a. Please describe and provide any empirical evidence, or cite third-party research, showing preferences, broken down by customer segment if available, for Prepay service.
- i. For any such evidence or research provided, please also describe and provide the benefits or features most valued by customers, again broken down by customer segment.

Answer: The Company does not have such data for the customer segments as defined in its testimony in the instant case. However, the Company provided in response to Soulardarity discovery question SDE-1.3, a copy of the most recent survey reviewed by the Company from the PEWG, which includes feedback from survey participants related to utility prepay programs and preferences for different segments of customers.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.3b
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that Prepay gives customers the ability to pay what they want, when they want. (MJH 5:22-24)

b. Does the Company have any empirical evidence, or can it cite third-party research, showing that some customers prefer to make multiple pre-payments as opposed to single, monthly post-payments? Please describe and provide that evidence.

Answer: No.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.3ci
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that Prepay gives customers the ability to pay what they want, when they want. (MJH 5:22-24)

- c. How many times per month does the Company expect Prepay participants to make prepayments? Is the answer based on the experience of other utilities that already offer prepay rates, or on the Company's own research?
- i. Does the Company anticipate differences in payment frequency or other payment behaviors among the four target market segments witness Hatsios describes? Why? Please cite and provide any empirical evidence or third-party research.

Answer: The Company expects DTE PrePay customers will pay at a frequency that is in-line with what has been described as the experience of other utilities providing prepay, which is between 3 to 7 times per month.

The Company has not forecast differences in the frequency of payments between the four target market segments, but would anticipate that they would all fall within the range of what other utility prepay providers have experienced for their customers.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.3di
Respondent: M. Hatsios / Legal
Page: 1 of 1

Question: Witness Hatsios states that Prepay gives customers the ability to pay what they want, when they want. (MJH 5:22-24)

- d. If a current post-pay customer were to pay more than the amount due on their current bill, would the Company refund the difference, credit the extra amount toward future bills, or something else?
- i. In an average month, how many residential post-pay customers pay more than their current bill, excluding deposits and any amounts applied to arrearages?

Answer: DTE Electric objects for the reason that the information requested is not relevant, nor is it reasonably calculated to lead to the discovery of admissible evidence. Subject to this objection, and without waiving this objection, if a post-pay customers chooses to pay more than the amount due on their current bill, the difference is applied as a credit on their account that would be applied to their next bill.

The Company does not track how many customers pay more than the amount due on their current bill.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.3dii
Respondent: M. Hatsios / Legal
Page: 1 of 1

Question: Witness Hatsios states that Prepay gives customers the ability to pay what they want, when they want. (MJH 5:22-24)

- d. If a current post-pay customer were to pay more than the amount due on their current bill, would the Company refund the difference, credit the extra amount toward future bills, or something else?
- ii. Does the Company have any evidence to suggest that post-pay customers who pay more than they currently owe do so on purpose as a way to prepay? Please describe and provide any such evidence.

Answer: Part d. of this question is duplicative to AGCUBDE-1.3di.

DTE Electric objects for the reason that the information requested is not relevant, nor is it reasonably calculated to lead to the discovery of admissible evidence. Subject to this objection, and without waiving this objection, no, the Company does not have data or evidence to suggest post-pay customers pay more than they owe as a form of prepay.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.3diii
Respondent: M. Hatsios / Legal
Page: 1 of 1

Question: Witness Hatsios states that Prepay gives customers the ability to pay what they want, when they want. (MJH 5:22-24)

d. If a current post-pay customer were to pay more than the amount due on their current bill, would the Company refund the difference, credit the extra amount toward future bills, or something else?

iii. Does the Company, or has the Company ever, encouraged post-pay customers to pay more than they currently owe as a way to build up a credit balance on their accounts, or for any other purpose? Disregard payments required as deposits or to settle past-due balances. Please describe any such efforts and results including the number of customers that have participated, how much they prepaid, and any changes the Company has noted in their energy use and costs.

Answer: Part d. of this question is duplicative AGCUBDE-1.3di

DTE Electric objects for the reason that the information requested is not relevant, nor is it reasonably calculated to lead to the discovery of admissible evidence. Subject to this objection, and without waiving this objection, no, the Company to my knowledge does not encourage post-pay customers to pay more than the owe as a way to build up credit.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.3div
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that Prepay gives customers the ability to pay what they want, when they want. (MJH 5:22-24)

- d. If a current post-pay customer were to pay more than the amount due on their current bill, would the Company refund the difference, credit the extra amount toward future bills, or something else?
- iv. What different incentives or benefits would be available to a Prepay customer compared to a post-pay customer who voluntarily pays in advance?

Answer: Part d of this question is duplicative AGCUBDE-1.3di

The Company maintains that it has articulated in its testimony in the instant case the differences between prepay and post-pay billing, and how the design and elements of prepay billing would benefit the targeted customer segments who voluntarily switch from post-pay to PrePay.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.4a
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that a benefit of Prepay is “a simplified billing experience that eliminates the need for what some customers find a complicated monthly bill.” (MJH 5:25-6:1)

- a. Please describe how a Prepay bill can be simpler than a post-pay bill, and whether a similar simplified approach is impractical or otherwise unavailable for post-pay customers.

Answer: The billing experience is more than just a physical bill, which will be made available to PrePay customers in the form of a monthly billing statement that they can access and review. Customers will be provided all of the same MPSC required information that is included on a post-pay monthly bill statement. A sample of the first page of this monthly statement is provided in the Company’s testimony in the instant case, which includes all credits applied to the PrePay account, the currently available credit balance, and a graph of average daily usage by month.

The experience is made simpler by providing PrePay customers with access to a daily view of the credit and number of days of usage remaining on their account, along with easy links to add funds in an amount that they choose. PrePay customers can also set up an auto-reload function, as described in the Company’s testimony in the instant case, that will automatically add funds when their credit balance reaches a threshold the customer chooses. This is a much different experience than waiting for a monthly bill to see what you owe and when it is due.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.4bi
Respondent: M. Hatsios / Legal
Page: 1 of 1

Question: Witness Hatsios states that a benefit of Prepay is “a simplified billing experience that eliminates the need for what some customers find a complicated monthly bill.” (MJH 5:25-6:1)

- b. Has the Company experimented with “simplified” bill formats and information content for post-pay customers?
- i. If so, what results has the Company observed?

Answer: DTE Electric objects for the reason that the information requested is not relevant, nor is it reasonably calculated to lead to the discovery of admissible evidence. Subject to this objection, and without waiving this objection, to my knowledge, the Company has not experimented with a simplified bill format for post-pay customers.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.4bii
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that a benefit of Prepay is “a simplified billing experience that eliminates the need for what some customers find a complicated monthly bill.” (MJH 5:25-6:1)

- b. Has the Company experimented with “simplified” bill formats and information content for post-pay customers?
- ii. Does the Company have any empirical evidence, or access to third-party research, demonstrating that providing customers with less information than that on a post-pay bill gives them greater visibility into their energy usage and greater control over their costs? Please describe and provide that evidence or research.

Answer: Part b. of this question is duplicative to AGCUBDE-1.4bi.

No, the Company does not have access to such data as the Company does not maintain that greater visibility and control comes from less information on the bill. Per my response to AGCUBDE-1.4a, PrePay customers will be provided a monthly bill summary that contains the same MPSC required information as a post-pay bill. The benefits of increased visibility and control come from the design elements of the PrePay program.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.4ci
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that a benefit of Prepay is “a simplified billing experience that eliminates the need for what some customers find a complicated monthly bill.” (MJH 5:25-6:1)

- c. Will a Prepay customer ever receive a comprehensive, retrospective statement of energy use and cost over a standardized and recent period of time such as a calendar month or year?
- i. If not, how does the Company anticipate that a Prepay customer might compare their energy use and cost over comparable time periods?

Answer: Please see my response to AGCUBDE-1.4a, which describes the information that will be provided on a customer’s monthly PrePay summary. Additionally, PrePay customers will be able to view historical usage on the PrePay portal when they log into their account on the web.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.5a
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that participants could apply a portion of any prepayment toward the reduction of any past due balance. (MJH 6:3)

a. Will the Company encourage post-pay customers with past-due balances to switch to Prepay?

Answer: As described in the Company's testimony in the instant case, customers with past-due balances will be provided the option to voluntarily enroll in PrePay as an alternative to a traditional payment plan, with specially trained teams of CRs determining if a customer would benefit from enrollment in PrePay and providing these customers with all of the relevant information to make an informed decision.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.5b
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that participants could apply a portion of any prepayment toward the reduction of any past due balance. (MJH 6:3)

b. Will customers who switch to Prepay have different eligibility to participate in payment plans and/or to receive assistance than post-pay customers?

Answer: As described in the Company's testimony in the instant case, and in the program Terms and Conditions, customers who voluntarily enroll in PrePay will not be eligible to participate in a payment plan but will have the ability to receive energy assistance.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.5c
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that participants could apply a portion of any prepayment toward the reduction of any past due balance. (MJH 6:3)

c. Will a Prepay customer who owes a past-due balance be allowed to switch back to post-pay when they want? What requirements, if any, would the Company impose for switching back?

Answer: As described in the Company's testimony in the instant case, a PrePay customer can switch back to post-pay at any time without any additional fees or penalties. In doing so, they will be responsible for any unpaid usage and be subject to the same deposit rules as any other post-pay customers.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.6
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that “Customers disconnected for non-payment can be reconnected by making a payment for any outstanding unpaid usage plus a minimum payment of \$40” (MJH 10:14) Does “unpaid usage” refer only to current amounts due, or past due/arrears as well?

Answer: Per the program Terms and Conditions, which were provided with the Company’s testimony in the instant case, “unpaid usage” refers to current amounts due only and not past due/arrears balances.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.7a
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that “In general, the dollars received will be used to pay down any past due balance, and when allowed by the agency providing the assistance, any remaining dollars will be applied to their PrePay credit balance to pay for future consumption.” (MJH 21:6-8)

a. Do any assistance agencies allow funds to be applied toward future consumption? Please describe any relevant restrictions.

Answer: Yes, where allowed by the agency providing the assistance, the Company will apply assistance dollars toward future consumption.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.7b
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that “In general, the dollars received will be used to pay down any past due balance, and when allowed by the agency providing the assistance, any remaining dollars will be applied to their PrePay credit balance to pay for future consumption.” (MJH 21:6-8)

b. Do assistance agencies prescribe or otherwise regulate the priority order in which their funds may be applied to customers’ past due balances, current accounts, and prepaid future consumption?

Answer: Yes, agency assistance dollars must first be applied to a customer’s past due balance, with any remaining dollars applied to the current bill, or in the case of PrePay towards future consumption, as allowed by the providing agency.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.8a
Respondent: M. Hatsios
Page: 1 of 1

Question: Regarding the four target customer segments identified by witness Hatsios:

- a. Based on actual market experience of other providers, published research, the Company's own market studies, or other sources, what percentage of total Prepay enrollees does the Company expect each market segment to comprise? Please cite and provide sources for your answer.

Answer: The Company has not attempted to forecast what percentage of customers who enroll in PrePay will come from each of the identified segments. The program is available to all customers, with the identified customer segments representing those segments that the Company maintains will most benefit from their voluntary enrollment in PrePay.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.8bi
Respondent: M. Hatsios
Page: 1 of 1

Question: Regarding the four target customer segments identified by witness Hatsios:

- b. Does the Company expect to have different proportional participation by the four target market segments in its Prepay offering compared to other utilities? If so,
- i. Why would the Company want different participation levels than other utilities experience?

Answer: Other utilities do not necessarily segment their customers in the same manner as DTE, and as such, the Company does not have any comparable data for comparison. However, the Company would expect that the demographics of customers who enroll in its prepay program will not differ significantly from that of other utility prepay providers.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.8bii
Respondent: M. Hatsios
Page: 1 of 1

Question: Regarding the four target customer segments identified by witness Hatsios:

- b. Does the Company expect to have different proportional participation by the four target market segments in its Prepay offering compared to other utilities? If so,
- ii. What does the Company propose to do differently that would cause these differing levels of participation?

Answer: See my response to AGCUBDE-1.8bi.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.8ci
Respondent: M. Hatsios
Page: 1 of 1

Question: Regarding the four target customer segments identified by witness Hatsios:

- c. Based on actual market experience of other providers, published research or other sources, what differences in average customer arrearages, delinquency and shutoff frequency does the Company expect to experience with each of the targeted market segments, compared to customers in the same market segment who do not participate in Prepay?
- i. What is the average number of payments per month made by the Company's residential postpay customers?

Answer: While difficult to forecast, of the four identified customer segments expected to benefit most from their voluntary enrollment in PrePay, the Payment Troubled and Vulnerable Customer segment would be expected to realize the most significant reduction in arrears and avoidance of potential shutoff.

Attached as part of the Company's response to the Soulardarity discovery question SDE-1.3 is a copy of a 2020 Bad Debt Analysis report by the PEWG. This report summarizes the experiences of other utility prepay providers in the reduction of bad debt expense for program participants. The Company would expect similar results for its PrePay program.

Attachments: None.

MPSC Case No.: U-21087

Requestor: AGCUB

Question No.: AGCUBDE-1.8cii

Respondent: M. Hatsios

Page: 1 of 1

Question: Regarding the four target customer segments identified by witness Hatsios:

- c. Based on actual market experience of other providers, published research or other sources, what differences in average customer arrearages, delinquency and shutoff frequency does the Company expect to experience with each of the targeted market segments, compared to customers in the same market segment who do not participate in Prepay?
- ii. Will the Company assess any kind of transaction or service fee to Prepay customers? Please describe.

Answer: Part c of this question is duplicative to AGCUBDE-1.8ci.

No, the Company will not assess a transaction or service fee for PrePay customers.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.9a
Respondent: M. Hatsios
Page: 1 of 1

Question: What evidence does the Company have that “Young and Tech Savvy” customers are motivated to reduce energy use and climate footprint by financial incentives/processes? (Hatsios 6:12)

a. Witness Hatsios (6:15-18) suggests that Young and Tech Savvy customers comprise a disproportionate share of DTE Insight users and Michigan Green Power programs. Given these successes, why does the Company believe Prepay will increase their engagement in how much electricity they use and help them further reduce their carbon footprint?

Answer: Younger customers, and customers who identify as more technologically savvy, make up a significant percentage of users of the DTE Insight App and an increasing percentage of MIGP enrollments, indicating a greater propensity to monitor their usage and to pay a premium to support green power initiatives.

The Company maintains that PrePay could offer another voluntary billing alternative and tool for these customers to monitor and reduce their energy usage and their energy costs.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.10ai
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that the Company receives over 1.2 million calls per year from customers who have questions about their bill, balance, or other charges and information on the bill. (MJH 6:24-7:13).

- a. Does the Company anticipate that it will have fewer customer-service interactions with Prepay customers than with otherwise similar post-pay customers, even if Prepay customers are interacting with their accounts more frequently and with greater urgency? Why?
- i. Does the Company anticipate that financially struggling customers who receive notice of impending zero balance and shutoff will be less likely to call customer service lines than post-pay customers who receive a bill due in several weeks? Why? Please support your answer with empirical evidence or research.

Answer: Yes, the Company expects that as more and more customers voluntarily enroll in PrePay, these customers will have less of a propensity to contact the Company to discuss their bill. PrePay customers will know daily how much energy they have left and the cost of that energy, thereby eliminating any surprises and reducing the need to contact the Company.

As described in the Company's response to Q19 of its testimony in the instant case, today's financially struggling post-pay customers often find themselves in a repeated cycle of arrears accumulation and disconnects, which drives them to repeatedly contact the Company for help. PrePay will allow these customers to pay for the energy they need in amounts and at a frequency that better aligns with their financial situation, thereby avoiding the ongoing accumulation of arrears and repeated risk of disconnection for non-payment.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.10aii
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that the Company receives over 1.2 million calls per year from customers who have questions about their bill, balance, or other charges and information on the bill. (MJH 6:24-7:13).

- a. Does the Company anticipate that it will have fewer customer-service interactions with Prepay customers than with otherwise similar post-pay customers, even if Prepay customers are interacting with their accounts more frequently and with greater urgency? Why?
- ii. Does the Company expect that these Prepay customers will have a more satisfactory customer-service experience than post-pay customers experiencing payment difficulties? Why? Please support your answer with empirical evidence or research.

Answer: Part a. of this question is duplicative to AGCUBDE-1.10ai.

The Company maintains that for customers who voluntarily enroll in PrePay, the program provides them the opportunity to easily pay down any past due balances, and to pay in amounts and at a frequency that aligns with their financial situation, and that will not impact their ability to receive energy assistance, all of which is expected to drive increased levels of satisfaction for this customer segment.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.10b
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that the Company receives over 1.2 million calls per year from customers who have questions about their bill, balance, or other charges and information on the bill. (MJH 6:24-7:13).

b. Is the Company able to reliably attribute these calls to customers within any of the target market segments described by witness Hatsios? How?

Answer: The Company does not have the capability to track calls from each of the identified customer segments. And while the Company does periodically estimate the numbers of calls received from low-income customers, it relies on Customer Representatives handling a call to manually capture that information, which is not always accurate or reliable.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.10c
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that the Company receives over 1.2 million calls per year from customers who have questions about their bill, balance, or other charges and information on the bill. (MJH 6:24-7:13).

c. Does the Company maintain that providing customers with less billing information will reduce customer confusion and frustration and make them savvier users of energy? If so, what evidence does the Company have for this claim?

Answer: No. The Company does however maintain that PrePay eliminates confusion and frustration by giving customers clear visibility daily into what they are using and how much it costs them, and putting them in control of how much they pay and at what frequency.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.11a
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios describes anticipated benefits of Prepay for renters and college students. (MJH 7:15 onwards)

- a. “PrePay eliminates the need for complicated ID validations and document submissions, with customers simply required to provide a photo ID and confirmation of their current address.” (MJH 7:17-19). Please describe in greater specificity how the ID and documentation requirements are simpler or less onerous for Prepay customers than for post-pay customers.

Answer: The ID validation process for PrePay is similar to post-pay, with the Company still asking for a valid form of identification to confirm the customer is who they say they are. This is to ensure that a PrePay customer is not associated with any known theft at the site and for fraud protection.

While there may be instances where a prospective PrePay customer may be asked to provide supporting documentation, the specially trained PrePay CRs managing enrollments will be empowered to exempt a PrePay customer from these requirements depending on the circumstances.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.11b
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios describes anticipated benefits of Prepay for renters and college students. (MJH 7:15 onwards)

b. Does the Company have any evidence indicating that renters or college students have comparative difficulty satisfying ID and documentation requirements and that this results in customer dissatisfaction, or their residences not receiving electrical service?

Answer: No.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.11ci
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios describes anticipated benefits of Prepay for renters and college students. (MJH 7:15 onwards)

- c. What percentage of prospective residential customers are unable to provide ID validations and documents required to open a new account with the Company?
- i. How does the Company currently respond when an applicant for a new account is unable to provide required ID and/or documentation?

Answer: The Company's data indicates that approximately 2-3% of customers do not submit the required documentation to open a new account with the Company.

The Company provides several alternatives for the submission of the required documents, with customers reminded of the need to submit documents if they fail to respond to the initial request. The Company will not establish service for customers who do not provide the necessary documentation.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.11cii
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios describes anticipated benefits of Prepay for renters and college students. (MJH 7:15 onwards)

- c. What percentage of prospective residential customers are unable to provide ID validations and documents required to open a new account with the Company?
- ii. Does the Company anticipate that many applicants who cannot provide ID and documentation required to open a post-pay account will be able to satisfy the requirements to open a Prepay account? Please describe what barriers may be lower for opening a Prepay account compared to a post-pay account.

Answer: Part c. of this question is duplicative to AGCUBDE-1.11ci.

The barriers to opening a PrePay account are lower as it relates to the amount due for some customers to establish service. To establish service in PrePay, we waive the requirement of paying a deposit. We also allow the customer to roll over arrears up to \$750.

For post-pay, if a customer is non-low-income and requesting service, we would require full payment of any past due bill and deposit. The only way to establish service and not pay this full amount is by enrolling in PrePay, or qualifying as low-income. To qualify as low-income, the customer would need to provide various documents so that we can determine the customer's FPL (federal poverty level).

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.11ciii
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios describes anticipated benefits of Prepay for renters and college students. (MJH 7:15 onwards)

- c. What percentage of prospective residential customers are unable to provide ID validations and documents required to open a new account with the Company?
- iii. Will the Company encourage account applicants who cannot supply ID and documentation for a post-pay account to apply for a Prepay account instead?

Answer: Part c. of this question is duplicative to AGCUBDE-1.11ci.

The Company will need to confirm the ID of all PrePay and post-pay customers and will not position PrePay as a means for customers to avoiding having to validate their ID. The flexibility for a PrePay customer will come in the potential to be exempted from submitting documents and avoiding deposit requirements.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.12ai
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios describes the use of text messaging and emails to communicate with Prepay customers. (MJH 15:10 onwards)

a. Does the Company have any data showing how many, or how often Payment Troubled and Vulnerable Customers:

i. Do not have access to text messaging or cell phone service?

Answer: To the best of my knowledge the Company does not have such information.

Attachments: None.

Requestor: AGCUB
Question No.: AGCUBDE-1.12aii
Respondent: M. Hatsios
Page: 1 of 1

- Question:** Witness Hatsios describes the use of text messaging and emails to communicate with Prepay customers. (MJH 15:10 onwards)
- a. Does the Company have any data showing how many, or how often Payment Troubled and Vulnerable Customers:
 - ii. Do not have access to the Internet?

Answer: To my knowledge the Company does not have this information.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.12aiii
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios describes the use of text messaging and emails to communicate with Prepay customers. (MJH 15:10 onwards)

a. Does the Company have any data showing how many, or how often Payment Troubled and Vulnerable Customers:

iii. Do not have access to e-mail?

Answer: To my knowledge the Company does not have this information.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.12b
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios describes the use of text messaging and emails to communicate with Prepay customers. (MJH 15:10 onwards)

b. How will the Company respond when it is unable to contact a low-balance customer via text, telephone, email, or Internet?

Answer: Per the program Terms and Conditions, which are provided as part of the Company's testimony in the instant case, customers must provide a valid email to enroll in PrePay, with the option to also receive text messages. Customers are responsible for ensuring that their preferred methods of communication are accurate and up-to date.

The Company will monitor these communications to identify, to the extent possible, instances where the system either did not generate the appropriate notification, or situations in which a generated notification was not received by the customer. When identified, the Company will, to the best of its ability, reach out to the customer to correct the issue and will defer the disconnection of service until such time as the issue is resolved.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.13a
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that prepay is expected to reduce customers' energy consumption. (MJH 10:1-12)

- a. Please describe and provide any research of which the Company is aware that explains why prepay customers reduce their energy usage. In particular, please address whether any research has rigorously distinguished between conservation behaviors versus self-deprivation behaviors among prepay customers of other utilities.

Answer: The Company has included in its testimony in the instant case (in response to Q14) references to several studies that evaluated the average reduction in energy usage for prepay customers, along with the results of our own assessment of energy usage reductions for customers who participated in the Company's Pay As You Go Pilot.

The Company is not aware of any research that has rigorously and definitively determined how much of these realized reductions are due to conservation versus self-deprivation behaviors.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.13b
Respondent: M. Hatsios
Page: 1 of 1

Question: Witness Hatsios states that prepay is expected to reduce customers' energy consumption. (MJH 10:1-12)

b. Please also address, and provide any relevant research of which the Company is aware, the extent to which prepay customers reducing their energy usage is motivated by conservation messages versus impending shutoff.

Answer: The Company is not aware of any research that investigated if the measured energy usage reductions for utility prepay customers is motivated by conservation messages or pending shutoff.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.14a
Respondent: M. Hatsios
Page: 1 of 1

Question: Please explain why customers with medical emergencies and senior customers with winter protection plan will not be eligible to participate in the program.

- a. Does the Company believe that these customers would not be able to realize the expected benefits of Prepay, including greater insight into their energy use and control over their costs?

Answer: Please reference my response to the Souldarity discovery question SDE-1.24ci.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-1.14b
Respondent: M. Hatsios
Page: 1 of 1

Question: Please explain why customers with medical emergencies and senior customers with winter protection plan will not be eligible to participate in the program.

b. Will the Company permit a customer to enroll in prepay if another member of the household is known to be a senior citizen?

Answer: Yes.

Attachments: None.

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of **DTE Electric**)
Company for the approval of a partial waiver of)
the Consumer Standards and Billing Practices for)
Electric Residential Service and approval of a)
Voluntary Prepay Billing Program.)

Case No. U-21087

PROOF OF SERVICE

ESTELLA R. BRANSON states that on December 17, 2021, she served a copy of the DTE Electric Company's Response to Michigan Attorney General and Citizen's Utility Board of Michigan's First Discovery Request in the above captioned matter, via electronic mail upon the persons listed on the attached service list.

**Estella R.
Branson**

Digitally signed by Estella R.
Branson
Date: 2021.12.17 11:51:03
-05'00'

ESTELLA R. BRANSON

MPSC Case No. U-21087

SERVICE LIST

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Prepay Energy: Case of Market Catching Up to Consumers

October, 2019

Presented to the
Prepay Energy Working Group (PEWG)
Workshop in Charlotte, NC
October 24-25, 2019



Russell RESEARCH

Consumer Survey Report No. 38

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Overview

Prepay energy continues to pick up momentum since our 2018 customer survey. Regulatory commissions in Illinois and Pennsylvania have approved prepay energy offerings. Existing prepay offerings have added tens of thousands of new customers across the country.

Prepay energy is a voluntary bill pay option to pay for energy into the future. It is not the first choice for everyone; however, for a growing number of customers, prepay energy helps to better manage utility bills and avoid surprises. Our research consistently shows a significant increase in customer satisfaction when there is an alignment between prepay and customer preference.

In conjunction with the members of the Prepay Energy Working Group (PEWG), we designed our annual customer survey to include both tracking questions from prior years, as well as a selection of new questions.

This year's survey focus was two-fold. First, we continue to seek consumer input on how to improve design features and functionality of prepay energy offerings. Questions on payment preferences, frequency, payment channels, etc., are important to tweak existing programs.

We also asked more strategic questions to better understand how prepay energy has become a catalyst for innovation in the utility sector. Customers are highly receptive to new payment options that have been enabled by prepay but are different than prepay. "Pay-by-Day" is a good example.

In short, as customer preference grows for prepay energy, the offering itself continues to evolve to even better satisfy customers.





Methodology



- The Russell Omnibus was conducted via the internet among 1,019 adults 18 years of age or older from September 20 - 23, 2019. Figures for gender, age, and geography were weighted where necessary to match their actual proportions in the population. The bases shown in this report are the unweighted bases.
- An invitation to participate in the study was sent by e-mail to panel members who have agreed to be contacted by Russell Research and interviewed over the Internet.
 - Participating respondents were interviewed online at a secure Russell Research URL programmed for this study.
 - Sample was provided to Russell Research from a leading sample provider.
- All research was carried out in compliance with all relevant legal and ethical requirements within the market and in compliance with ISO 20252:2012.



Statistical Analysis



The statistical significance of a result in this survey is the probability that the observed relationship (e.g., between variables) or difference (e.g., between means) in a sample occurred by pure chance, and that in the population from which the sample was drawn, no such relationship or differences exist. Using less technical terms, one could say that the statistical significance of a result tells us something about the degree to which the result is "true". More technically, the value of the p-value represents a decreasing index of the reliability of a result. The higher the p-value, the less we can believe that the observed relation between variables in the sample is a reliable indicator of the relation between the respective variables in the population. Specifically, the p-value represents the probability of error that is involved in accepting our observed result as valid, that is, as "representative of the population." For example, a p-value of .05 (i.e., 1/20) indicates that there is a 5% probability that the relation between the variables found in our sample is a "fluke."

The following statistical notation is used throughout the report:

= Indicates figure is significantly higher than other cell at a 95% confidence level (i.e. p-value of .05 or less).

In theory, with probability samples of this size, one could say with 95 percent certainty that the results have a statistical precision of plus or minus 3.1 percentage points of what they would be if the entire adult population had been polled with complete accuracy. Unfortunately, there are several other possible sources of error in all polls or surveys that are probably more serious than theoretical calculations of sampling error. They include refusals to be interviewed (non-response), question wording and question order, and weighting. It is impossible to quantify the errors that may result from these factors. This online survey is not a probability sample.

Executive Summary

Executive Summary

The findings of this omnibus study indicate that interest in a voluntary prepaid energy service option offered by a local utility or provider is relatively low even though the majority of these consumers have used or purchased a prepaid card or service plan in the past (and been satisfied with their use). Interest is highest among adults 18 to 54 and those who rent their homes.

- 55% of adults have used some type of prepaid card in the past, with significantly higher usage among younger adults (58% of those 18-54 compared to 48% of those 55 or older) and those who rent (63% of renters vs. 50% of home owners).
 - More than three fourths of adults (76%) who have used a prepayment option in the past were at least somewhat satisfied using this method to make purchases or contract for services.
- Overall only 20% of these consumers would be extremely or very interested if their utility company were to offer a voluntary prepaid option. Interest was significantly higher among younger adults (24% of those 18-54 vs. 10% of older adults) and renters (26% vs. 16% of home owners).

Regardless of their interest in using a voluntary prepaid energy service option offered by their utility company, the majority are at least somewhat concerned that there would be convenience fees associated with this program.

- 83% of adults surveyed indicated that they would be somewhat or very concerned about having to pay new fees if they became a prepay customer – 43% were “very concerned” and 40% were “somewhat concerned”.
 - Approximately half of women and older adults were “very concerned”; significantly more than their counterparts (49% of women vs. 37% of men and 52% of older adults vs. 39% of those 18-54).





Executive Summary (continued)

The top benefits consumers would choose for a prepaid energy experience are related to reducing costs, budgeting and help with averages/seasonal cost fluctuations.

- More than one quarter (27%) would like to get tips on reducing energy costs, with significantly higher interest among those with \$50k or higher income (30% vs. 24% among those with less than \$50k).
- A weekly or monthly budget view and help with planning to reduce seasonal cost fluctuations (both 17%) are the other top benefits.

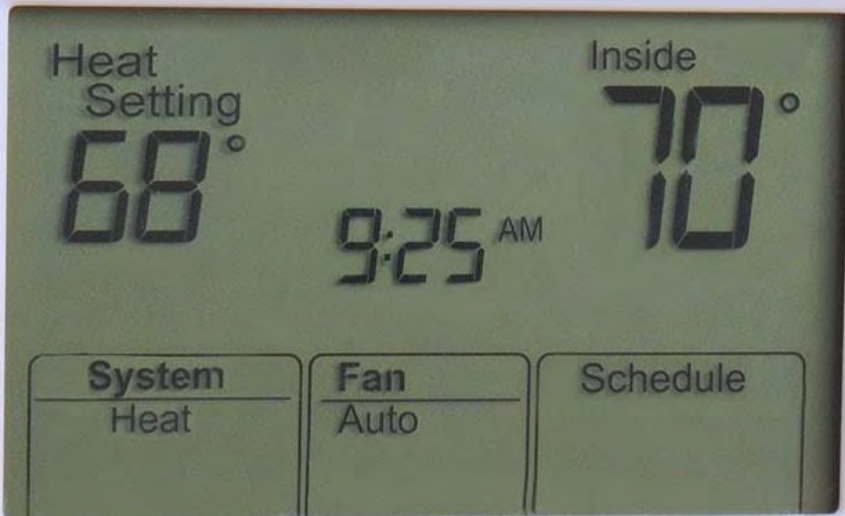
Their relationship with power usage and paying bills mirrors their chosen prepayment benefits by focusing on cost reduction, setting budgets and planning ahead.

- Based on the top two statements that best describe them, 36% of adults wish their utility would offer incentives towards their account and 28% would welcome recommendations for reducing monthly costs.
- One-third like having control of power usage and budget, while 29% usually try to budget and plan ahead for the cost of power. This is likely why one in four consumers say they find it difficult to predict the cost fluctuations between the seasons.

Executive Summary (continued)

In terms of ways to reload their account, the majority want to be able to make payments online/on a web site, (with a sizeable group also wanting to make payments using a smart phone or other electronic device or via automatic payments).

- For reloading their accounts, six out of ten put making payments online or through a web site among their two most important options.
- In addition, half included making payments via a smart phone or other electronic device and more than one-third included setting up automatic payments so credit is automatically added when the balance gets low among their top two.
 - Younger adults (56% vs. 34% of those 55+) were significantly more likely to include the smart phone option among their top two reload options compared to everyone else.
 - The automatic payment option was significantly more appealing to men (40% vs. 31% of women) and those with higher incomes (42% of those with household incomes of \$50k or higher vs. 28% with lower household incomes).



Executive Summary (continued)

On average, these adults indicated that they would add \$34 to their prepay energy account if it was approaching a zero balance (equally split among those who would add \$25 or less and those who would add \$26 or more).

- When presented with some specific ranges, 38% of these adults think that if they had a prepaid account and the balance was approaching zero they would likely add \$25 or less to keep their account open (specifically 9% would add less than \$5, 14% would add between \$5 and \$15, and 15% would add between \$16 and \$25).
- 38% also thought they would most likely add \$26 or more to keep their account open (with an even split of 19% for increments of \$26 - \$50 and more than \$50).
- Older adults (\$42.7 vs. \$31.4), those with higher incomes (\$40 vs. \$28.5), and homeowners (\$38.4 vs. \$29.7) indicated that they would make significantly higher payments compared to everyone else.

If there was no charge for making payments, more than three-quarters would make one or two payments per month to maintain their service when approaching a zero balance.

- There is a significantly greater likelihood that older adults (89% vs. 72% younger), those with higher incomes (81% vs. 73% with HHI less than \$50k) and home owners (81% vs. 72% of renters) would make one or two payments per month compared to everyone else.

When told that their service would be disconnected if their account balance reaches zero, one-third of consumers believe this would happen to them during the first year of enrolling in such a service.

- Younger adults (39% of 18-54 year olds vs. 19% of those 55+), renters (41% vs. 29% of home owners) and those with lower incomes (38% vs. 31% with HHI of \$50k+) were significantly more likely to feel that their service would end up being disconnected during the first year of enrollment in a prepay program.



Executive Summary (continued)

In terms of service disconnection, these consumers would prefer to be notified about pending service disruption by either text/SMS (39%) or email (28%).

When it comes to the amount of time ahead to be notified, more than eight out of ten would prefer at least a days notice before a possible disconnection due to money needing to be added to their prepaid account (with more than half wanting more than least two days notice).

- Women (59% vs. 44% of men) and older adults (58% age 55+ vs. 49% of those 18-54) are significantly more likely than the others to want to receive more than two days notice before their service is disconnected.
- While only 10% of total respondents prefer less than one day notice, men (14% vs. 6% of women), younger adults (12% vs. 3% of age 55+) and renters (13% vs. 8% of owners) are significantly more likely to prefer such short notice.

Executive Summary (continued)

Respondents were told about a program where they could let their service be terminated and then almost immediately (at their convenience and without penalty or fee) reconnect their service. When asked if they would ever consider self-disconnection as a way to conserve energy there was no definitive consensus on this program.

- Overall more than one fourth would consider self-disconnection, 22% would not, and half either said “depends” or they didn’t know.
- Younger adults (33% vs. 16% of older adults) were significantly more likely to consider self-disconnection.
- Conversely, older respondents (30% vs. 19% of younger adults) and home owners (26% vs. 18% of renters) were significantly more likely to say they would not consider self-disconnection.

Executive Summary (continued)

Respondents are open to various bill paying options. About half have at least some interest in automatic payments taken from a banking account rather than paying each time a bill is received.

- Age and income were significant differentiators with younger adults (31% vs. 21% of older adults) and those with higher household incomes (34% vs. 23% of those with lower incomes) being very or somewhat interested in automatic payments.

Additionally, 72% of respondents have at least some interest in going paperless and only paying their utility bill electronically, with half of them very or somewhat interested.

- Age and income were also significant differentiators in terms going paperless, with younger adults (54% vs. 42% of older adults) and those with higher household incomes (57% vs. 45% of those with lower incomes) being very or somewhat interested in going paperless.

Four out of ten had some interest in a “text to pay” option, with approximately two out of ten being extremely or very interested in this payment option, with significantly higher top-2-box interest among younger adults (26% vs. 6% of adults 55+) and renters (27% vs. 17% of home owners).

Executive Summary (continued)

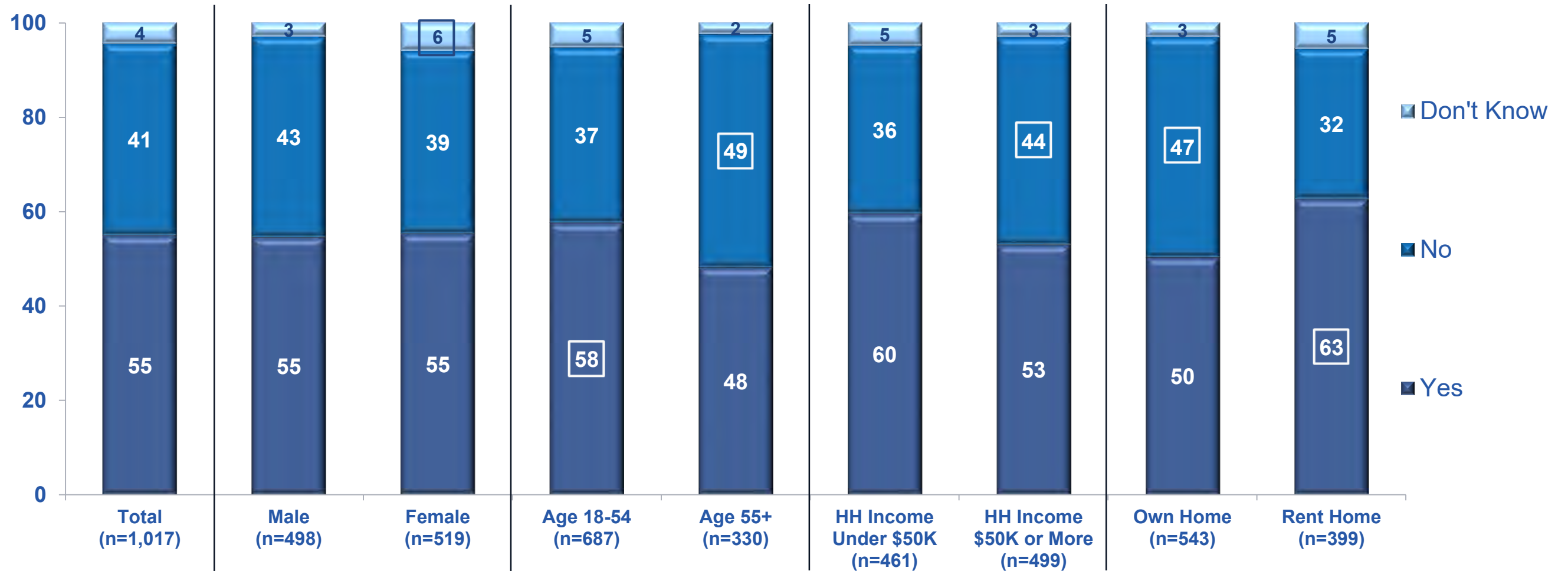
Two new payment options were presented – one where consumers could pay for their electricity at a local convenience or grocery store by having a bar code on their electric bill scanned at the check-out counter and another where they could choose to lock in a “daily rate” (i.e. \$5 per day). Approximately one in four adults indicated that they would be extremely or very interested in these two new options.

- 27% of survey respondents expressed a high level of interest in the bar code option. Interest was significantly higher among younger adults (33% vs. 11% of those 55+) and renters (32% vs. 23% of owners).
- Similarly, one fourth of these adults expressed a high level of interest in the “pay by day” option. Interest for this billing method was also significantly higher among younger adults (29% vs. 11% of those 55+) and renters (30% vs. 20% of owners).



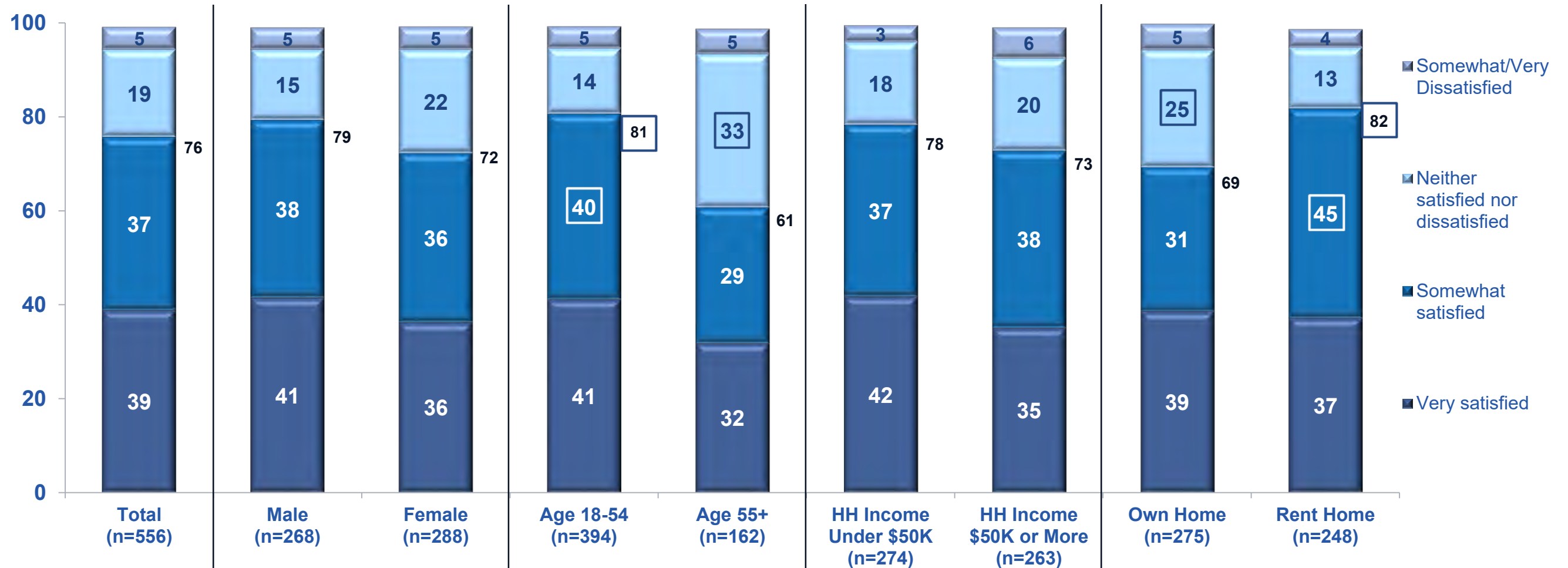
Detailed Findings

Have Ever Used/Purchased a Prepayment Option



Base: Total Who Have Ever Used/Purchased Prepayment Option. Q. B2 How would you generally rate your satisfaction with using prepayment as an option to make purchases or contract for services?

Satisfaction with Using Prepayment Option

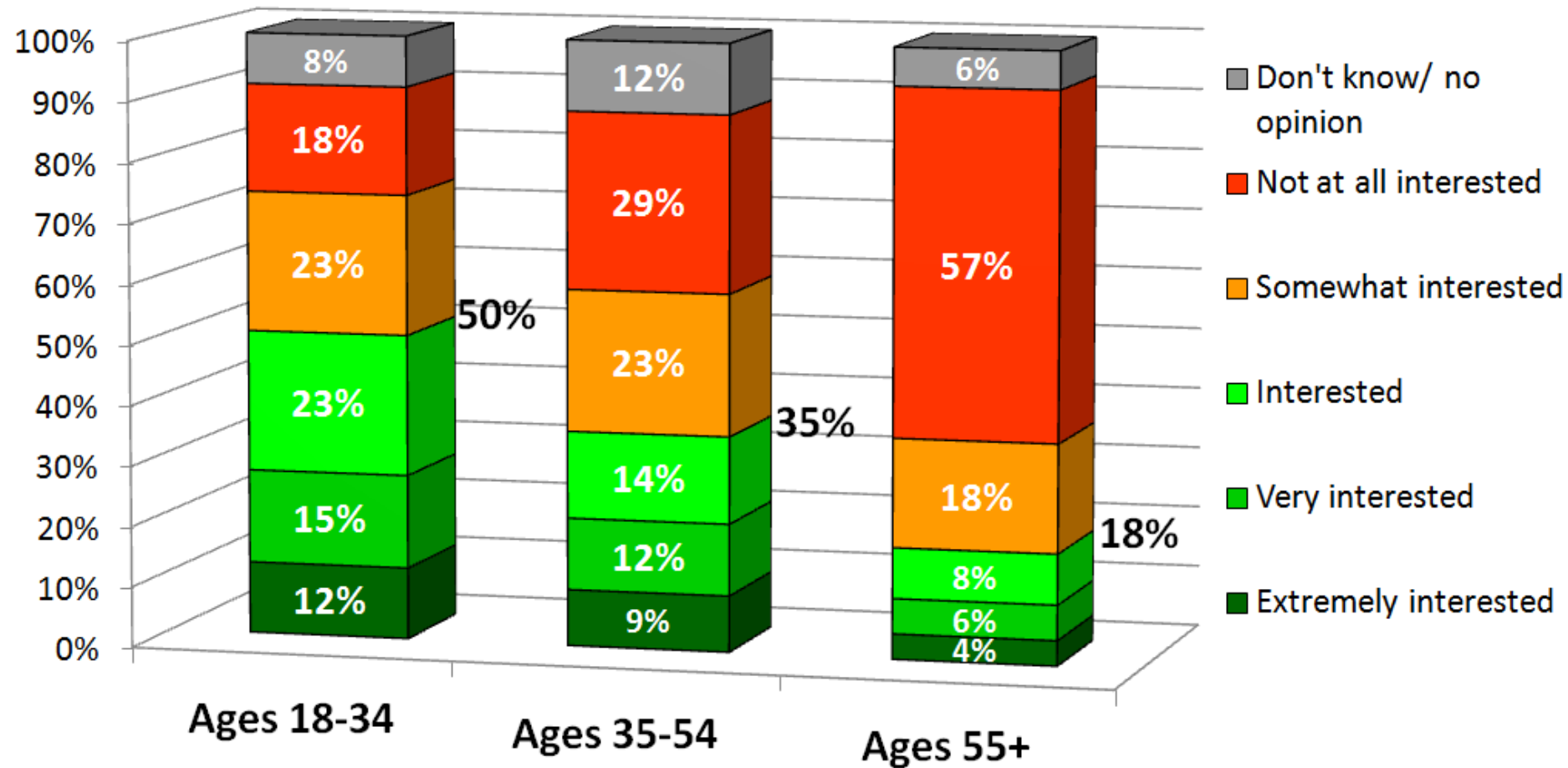


Base: Total Who Have Ever Used/Purchased Prepayment Option. Q. B2 How would you generally rate your satisfaction with using prepayment as an option to make purchases or contract for services?

Younger Adults Show a Strong Interest in a Prepaid Option

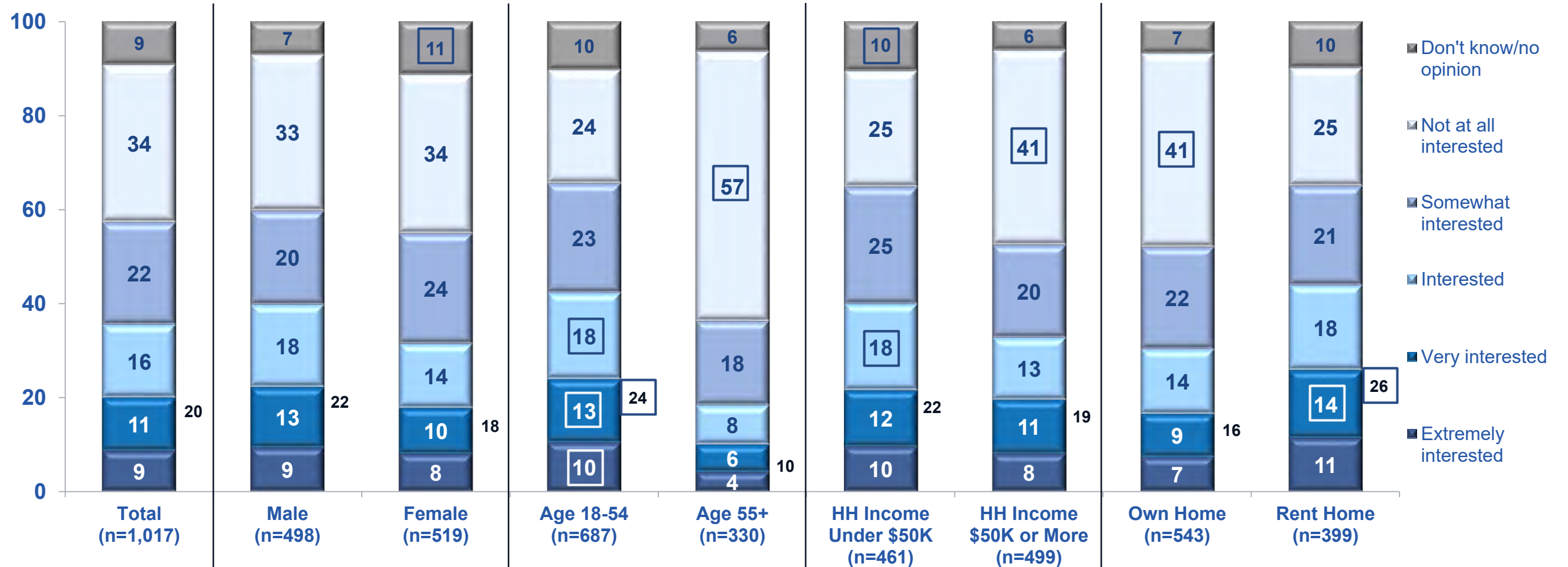
A continued focus on customer segmentation is important for program design and marketing

Interest in Voluntary Prepayment Option from Local Utility
 DEFG's Prepay Consumer Survey Report, 2019



Q.3. If your local utility or provider were to offer a voluntary prepaid option for consumers, how interested would you be?

Interest in Voluntary Prepayment Option from Local Utility



Base: Total Respondents. Q. B3 If your local utility or provider were to offer a voluntary prepaid option for consumers, how interested would you be?

Benefit Would Choose for Prepaid Energy Experience

| | <u>Total</u> | <u>Gender</u> | | <u>Age</u> | | <u>HH Income</u> | | <u>Home Ownership</u> | |
|---|--------------|---------------|---------------|--------------|------------|--------------------|------------------------|-----------------------|-------------|
| | | <u>Male</u> | <u>Female</u> | <u>18-54</u> | <u>55+</u> | <u>Under \$50K</u> | <u>\$50K or Higher</u> | <u>Own</u> | <u>Rent</u> |
| Total Respondents | (1,017) | (498) | (519) | (687) | (330) | (461) | (499) | (543) | (399) |
| | % | % | % | % | % | % | % | % | % |
| Tips for reducing your energy costs | 27 | 28 | 27 | 27 | 29 | 24 | 30 | 29 | 24 |
| A weekly or monthly budget view | 17 | 19 | 14 | 19 | 12 | 17 | 17 | 15 | 18 |
| Help with averages and planning to reduce seasonal cost fluctuations | 17 | 15 | 18 | 17 | 17 | 17 | 16 | 18 | 15 |
| Offer more conveniences for making payments and tracking usage | 16 | 18 | 14 | 15 | 17 | 16 | 17 | 17 | 16 |
| Proactive messages to keep you up to date about your account balance and status | 14 | 14 | 15 | 13 | 18 | 13 | 16 | 15 | 13 |
| A guide for payment assistance options | 9 | 6 | 12 | 9 | 8 | 13 | 5 | 6 | 13 |

Base: Total Respondents. Q. B4. If you could choose one of the following benefits provided from your utility for a prepaid energy experience, what would it be?

Top Two Statements Best Describe Relationship with Power Usage

| | <u>Total</u> | <u>Gender</u> | | <u>Age</u> | | <u>HH Income</u> | | <u>Home Ownership</u> | |
|---|--------------|---------------|---------------|--------------|------------|--------------------|------------------------|-----------------------|-------------|
| | | <u>Male</u> | <u>Female</u> | <u>18-54</u> | <u>55+</u> | <u>Under \$50K</u> | <u>\$50K or Higher</u> | <u>Own</u> | <u>Rent</u> |
| Total Respondents | (1,017) | (498) | (519) | (687) | (330) | (461) | (499) | (543) | (399) |
| | % | % | % | % | % | % | % | % | % |
| I wish my utility would offer incentives toward my account | 36 | 33 | 39 | 38 | 31 | 33 | 41 | 38 | 35 |
| I like the conveniences for paying my utility bill | 34 | 36 | 32 | 31 | 41 | 32 | 37 | 38 | 31 |
| I like having control of my power usage and budget | 32 | 37 | 27 | 30 | 35 | 29 | 32 | 34 | 29 |
| I usually try to budget and plan ahead for the cost of power | 29 | 30 | 28 | 30 | 25 | 34 | 24 | 28 | 31 |
| If my utility gave me recommendations for reducing my monthly costs, I would use them | 28 | 27 | 30 | 28 | 29 | 28 | 29 | 28 | 25 |
| Energy cost fluctuations between summer months and winter months are difficult to predict | 25 | 24 | 27 | 24 | 29 | 27 | 24 | 21 | 30 |
| I have difficulty keeping track of the amount of power that is being used | 16 | 14 | 18 | 19 | 10 | 17 | 15 | 13 | 18 |

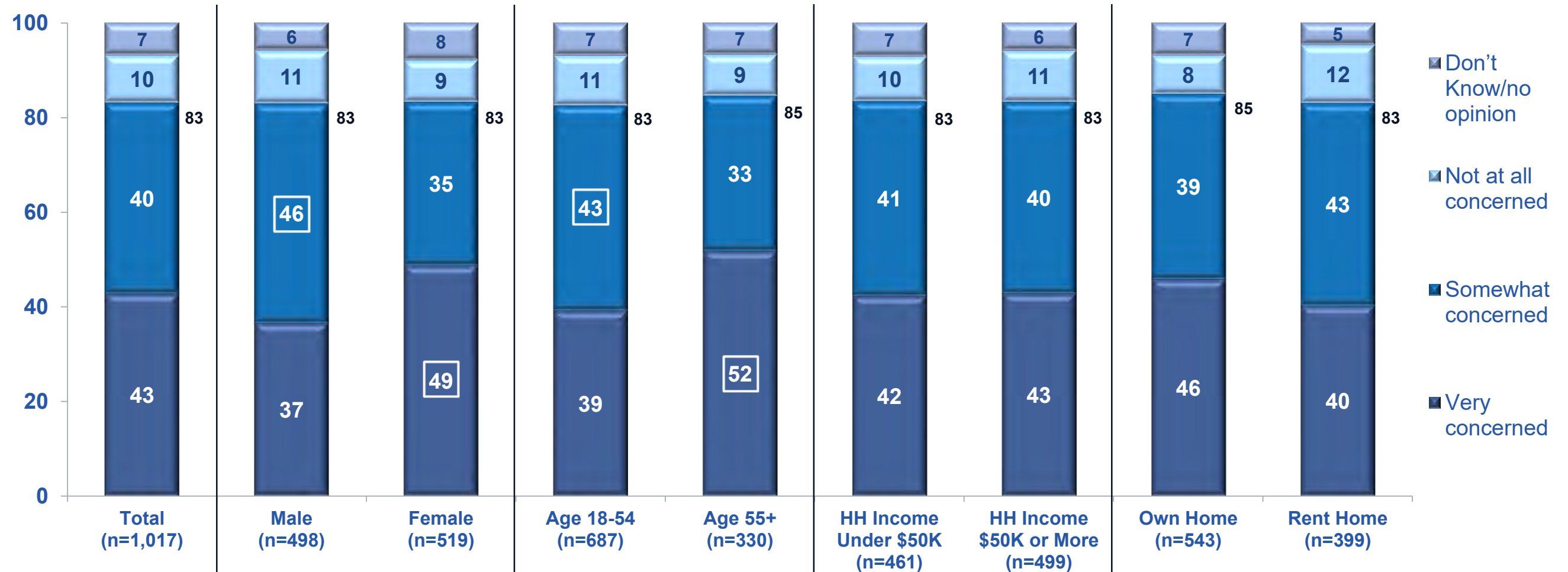
Base: Total Respondents. Q. B5 When it comes to paying bills, choose the **two** statements that best describe you.

Top Two Most Important Payment Reload Options

| | <u>Total</u> | <u>Gender</u> | | <u>Age</u> | | <u>HH Income</u> | | <u>Home Ownership</u> | |
|--|--------------|---------------|---------------|--------------|------------|--------------------|------------------------|-----------------------|-------------|
| | | <u>Male</u> | <u>Female</u> | <u>18-54</u> | <u>55+</u> | <u>Under \$50K</u> | <u>\$50K or Higher</u> | <u>Own</u> | <u>Rent</u> |
| Total Respondents | (1,017) | (498) | (519) | (687) | (330) | (461) | (499) | (543) | (399) |
| | % | % | % | % | % | % | % | % | % |
| To be able to make payments online/on a website | 63 | 61 | 65 | 61 | 67 | 60 | 65 | 64 | 62 |
| To be able to make payments on my smart phone or other electronic device | 50 | 47 | 52 | 56 | 34 | 52 | 48 | 46 | 53 |
| To be able to set up automatic payments so credit is automatically added when my balance gets low | 36 | 40 | 31 | 34 | 39 | 28 | 42 | 38 | 31 |
| To be able to make payments by check through the mail | 19 | 17 | 21 | 16 | 28 | 23 | 16 | 21 | 18 |
| To be able to make payments over the counter or when checking out at my local convenience store or grocery store | 15 | 14 | 16 | 15 | 16 | 17 | 13 | 13 | 19 |
| To be able to make cash or check payments at a conveniently-located kiosk | 14 | 16 | 13 | 17 | 8 | 17 | 12 | 13 | 16 |
| Other | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 |
| No second choice | 2 | 3 | 2 | 1 | 6 | 1 | 3 | 4 | 1 |

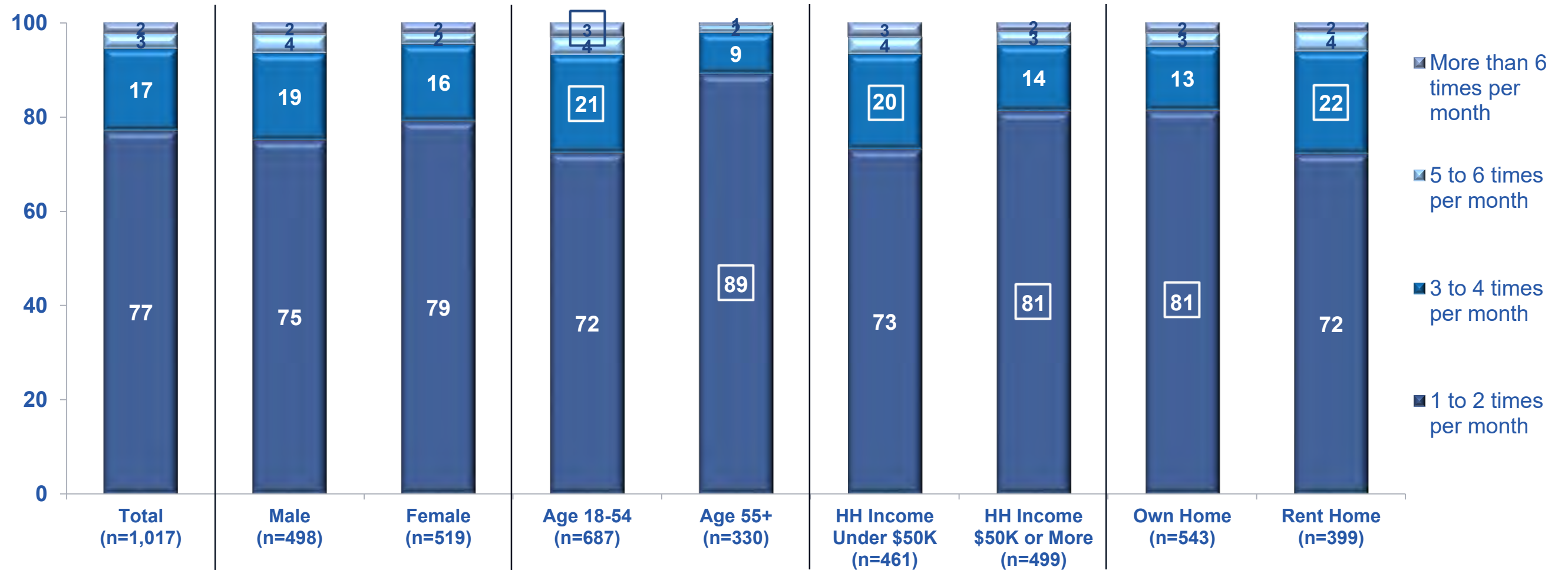
Base: Total Respondents. Q. B6 If you were to elect to use a prepaid energy service option, what two payment options to reload your account would be the most important to you?

Level of Concern for Convenience Fees Related to Prepay Energy Plans



Base: Total Respondents. Q. B7 Many methods for utility payment have convenience fees associated with the transactions (e.g., credit card fees or an ATM charge). How concerned are you about having to pay new fees if you became a prepay customer?

Frequency of Paying per Month When Approaching a Zero Balance if No Charge for Making Payments



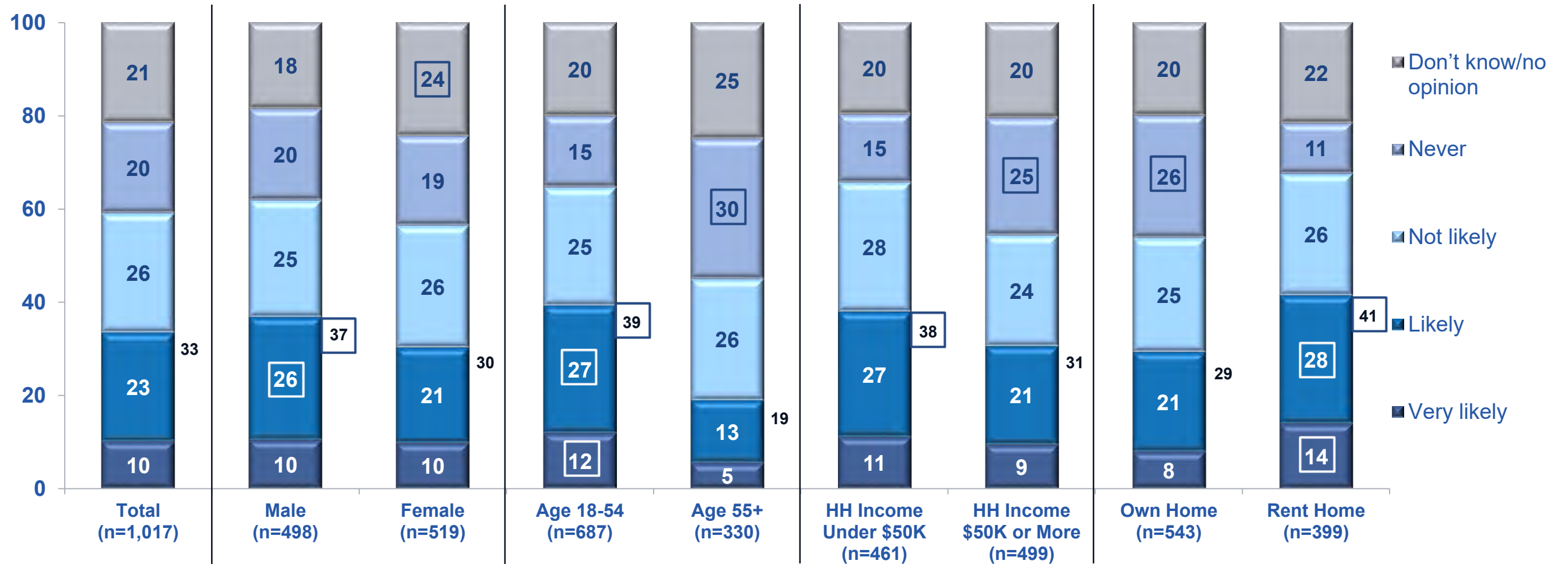
Base: Total Respondents. Q. B8 If you were a prepaid energy customer and the utility allowed you to pay by credit or debit card, ACH or by paying in cash at a convenience store and there were no charges to make each payment, how many times might you pay per month to maintain your service when your account approaches a zero balance?

Likely Payment Range to Maintain Service

| | Total | Gender | | Age | | HH Income | | Home Ownership | |
|----------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | | Male | Female | 18-54 | 55+ | Under \$50K | \$50K or Higher | Own | Rent |
| Total Respondents | (1,017) | (498) | (519) | (687) | (330) | (461) | (499) | (543) | (399) |
| | % | % | % | % | % | % | % | % | % |
| <u>\$25 Or Less (net)</u> | <u>38</u> | <u>43</u> | <u>33</u> | <u>44</u> | <u>23</u> | <u>46</u> | <u>32</u> | <u>33</u> | <u>47</u> |
| Less than \$5 | 9 | 8 | 9 | 9 | 7 | 11 | 7 | 8 | 10 |
| \$5 to \$15 | 14 | 16 | 12 | 17 | 7 | 19 | 10 | 13 | 17 |
| \$16 to \$25 | 15 | 19 | 12 | 18 | 8 | 16 | 15 | 13 | 20 |
| <u>\$26 Or More (net)</u> | <u>38</u> | <u>36</u> | <u>40</u> | <u>34</u> | <u>48</u> | <u>31</u> | <u>47</u> | <u>44</u> | <u>32</u> |
| \$26 to \$50 | 19 | 19 | 19 | 18 | 22 | 18 | 21 | 20 | 18 |
| More than \$50 | 19 | 17 | 21 | 16 | 25 | 13 | 26 | 24 | 14 |
| Don't know/no opinion | 24 | 21 | 27 | 21 | 30 | 23 | 21 | 23 | 21 |
| <u>Mean:</u> | <u>\$34.3</u> | <u>\$32.3</u> | <u>\$36.4</u> | <u>\$31.4</u> | <u>\$42.7</u> | <u>\$28.5</u> | <u>\$40.0</u> | <u>\$38.4</u> | <u>\$29.7</u> |

Base: Total Respondents. Q. B9 If you were on a prepay energy account, what would be the likely payment you would make to maintain your service when your account approaches a zero balance?

Likelihood That Prepay Energy Service Account Balance Would Hit Zero During First Year Resulting in Energy Source Being Disconnected



Base: Total Respondents. Q. B10 If you were a prepaid energy service customer, you can pay as much as you want as often as you want in order to stay above a zero balance; however, your electricity or gas would disconnect if your account balance reached zero dollars. How likely would that be to occur during the first year that you selected prepaid energy service?

Best Way to Receive Information About a Pending Energy Service Disconnection

| | Total | Gender | | Age | | HH Income | | Home Ownership | |
|--|---------|--------|--------|-------|-------|-------------|-----------------|----------------|-------|
| | | Male | Female | 18-54 | 55+ | Under \$50K | \$50K or Higher | Own | Rent |
| Total Respondents | (1,017) | (498) | (519) | (687) | (330) | (461) | (499) | (543) | (399) |
| | % | % | % | % | % | % | % | % | % |
| Text or SMS | 39 | 35 | 43 | 43 | 27 | 39 | 40 | 36 | 41 |
| Email | 28 | 30 | 27 | 27 | 31 | 27 | 30 | 30 | 28 |
| Phone call | 13 | 15 | 12 | 12 | 18 | 13 | 13 | 15 | 13 |
| Mail | 12 | 13 | 12 | 11 | 17 | 13 | 10 | 12 | 11 |
| A home visit by a utility representative | 3 | 4 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| Don't know/no opinion | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 5 |

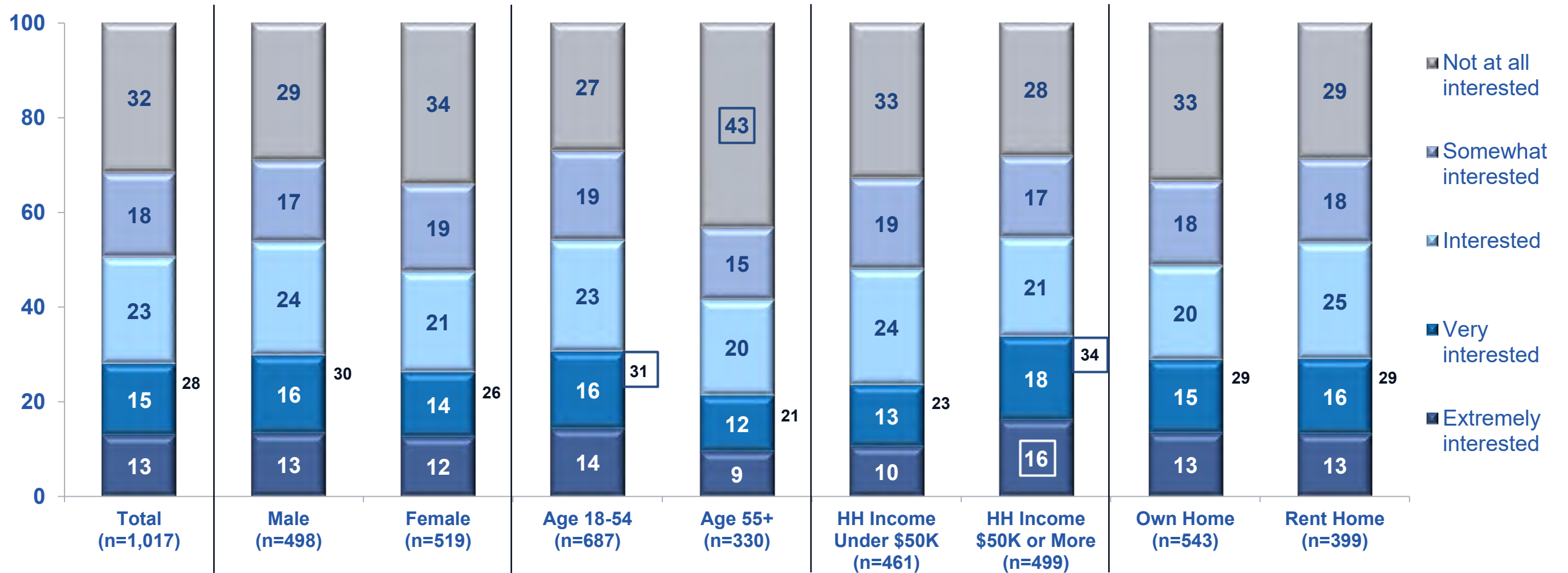
Base: Total Respondents. Q. B11 In order to receive important information about a pending disconnection due to unpaid bills regardless of what payment method you are using, which do you think is the best way to receive that information? Please choose your top choice.

Preferred Amount of Notice Regarding Possible Disconnection

| | <u>Total</u> | <u>Gender</u> | | <u>Age</u> | | <u>HH Income</u> | | <u>Home Ownership</u> | |
|-------------------------------------|------------------|------------------|------------------|------------------|------------------|--------------------|------------------------|-----------------------|------------------|
| | | <u>Male</u> | <u>Female</u> | <u>18-54</u> | <u>55+</u> | <u>Under \$50K</u> | <u>\$50K or Higher</u> | <u>Own</u> | <u>Rent</u> |
| Total Respondents | (1,017) | (498) | (519) | (687) | (330) | (461) | (499) | (543) | (399) |
| | % | % | % | % | % | % | % | % | % |
| <u>Less Than 1 Day (net)</u> | <u>10</u> | <u>14</u> | <u>6</u> | <u>12</u> | <u>3</u> | <u>11</u> | <u>9</u> | <u>8</u> | <u>13</u> |
| 1 hour | 4 | 6 | 3 | 5 | 2 | 4 | 5 | 4 | 6 |
| 2 to 8 hours | 5 | 8 | 3 | 7 | 1 | 6 | 5 | 4 | 8 |
| <u>1 Day Or More (net)</u> | <u>83</u> | <u>80</u> | <u>85</u> | <u>81</u> | <u>88</u> | <u>81</u> | <u>85</u> | <u>86</u> | <u>78</u> |
| A day | 11 | 14 | 8 | 11 | 10 | 10 | 12 | 11 | 11 |
| Two days | 20 | 22 | 18 | 21 | 19 | 20 | 20 | 22 | 18 |
| More than two days | 52 | 44 | 59 | 49 | 58 | 51 | 52 | 53 | 49 |
| Don't know/no opinion | 7 | 6 | 9 | 7 | 9 | 8 | 6 | 7 | 8 |

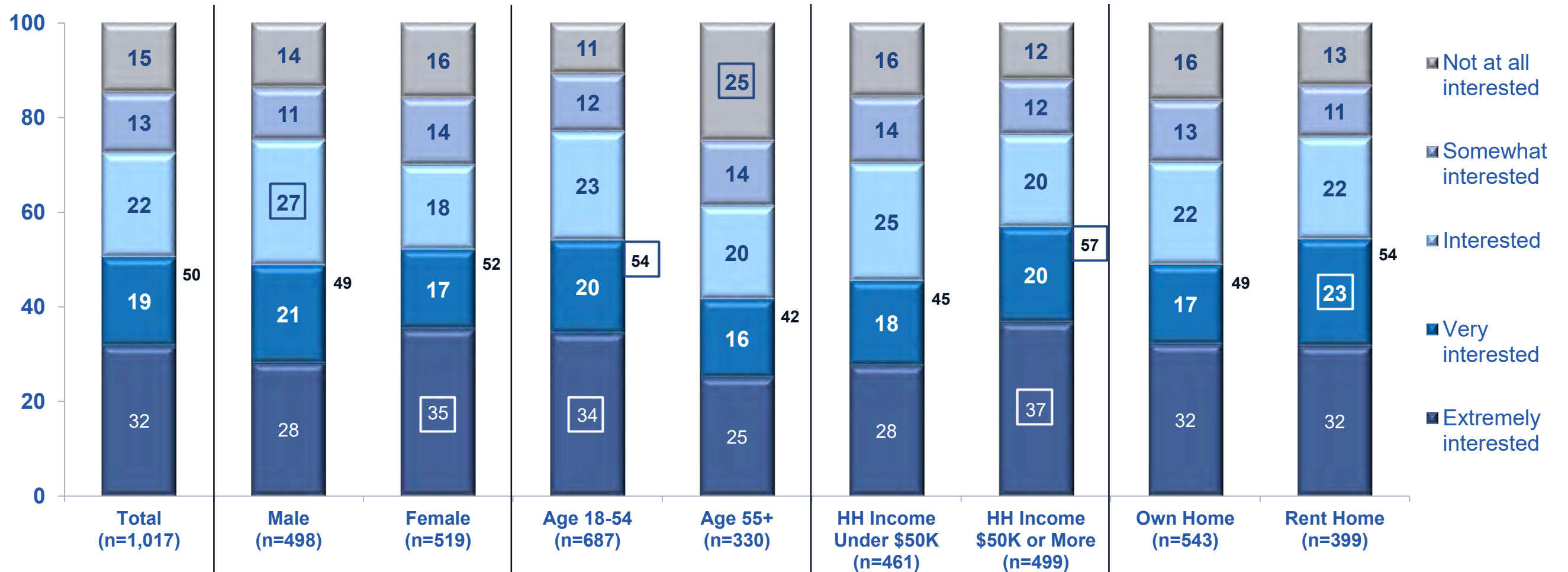
Base: Total Respondents. Q. B12 How much time would you prefer to have to receive a notice from your utility that you need to put more money in your prepaid energy account before a possible disconnection?

Interest in Automatic Payments Taken from Account



Base: Total Respondents. Q. B13 How interested would you be if your utility offered recurring payments taken automatically from your banking account instead of paying each time you receive a bill?

Interest in Going Paperless

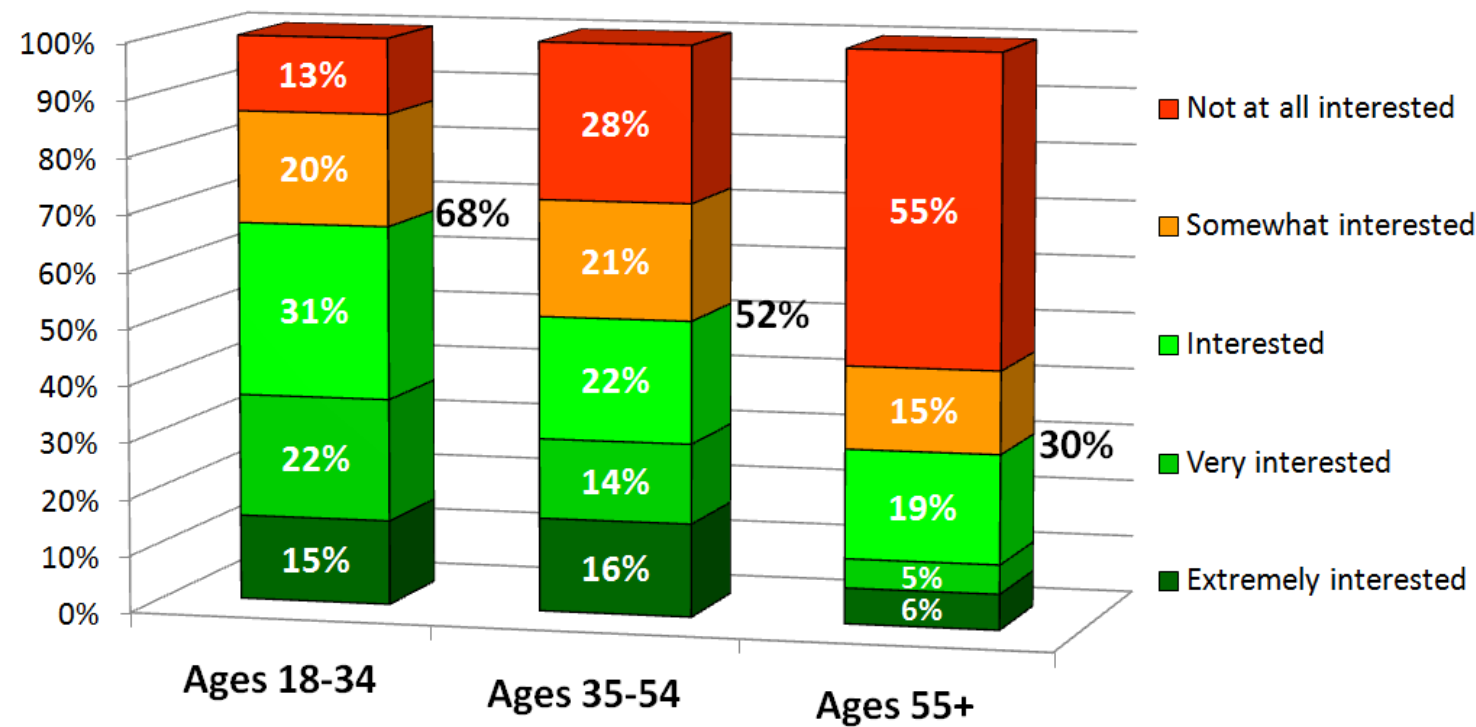


Base: Total Respondents. Q. B14 How interested would you be to go paperless and only pay your utility bill electronically?

Younger Adults Show Strong Interest in Bar Codes and “Pay by Day”

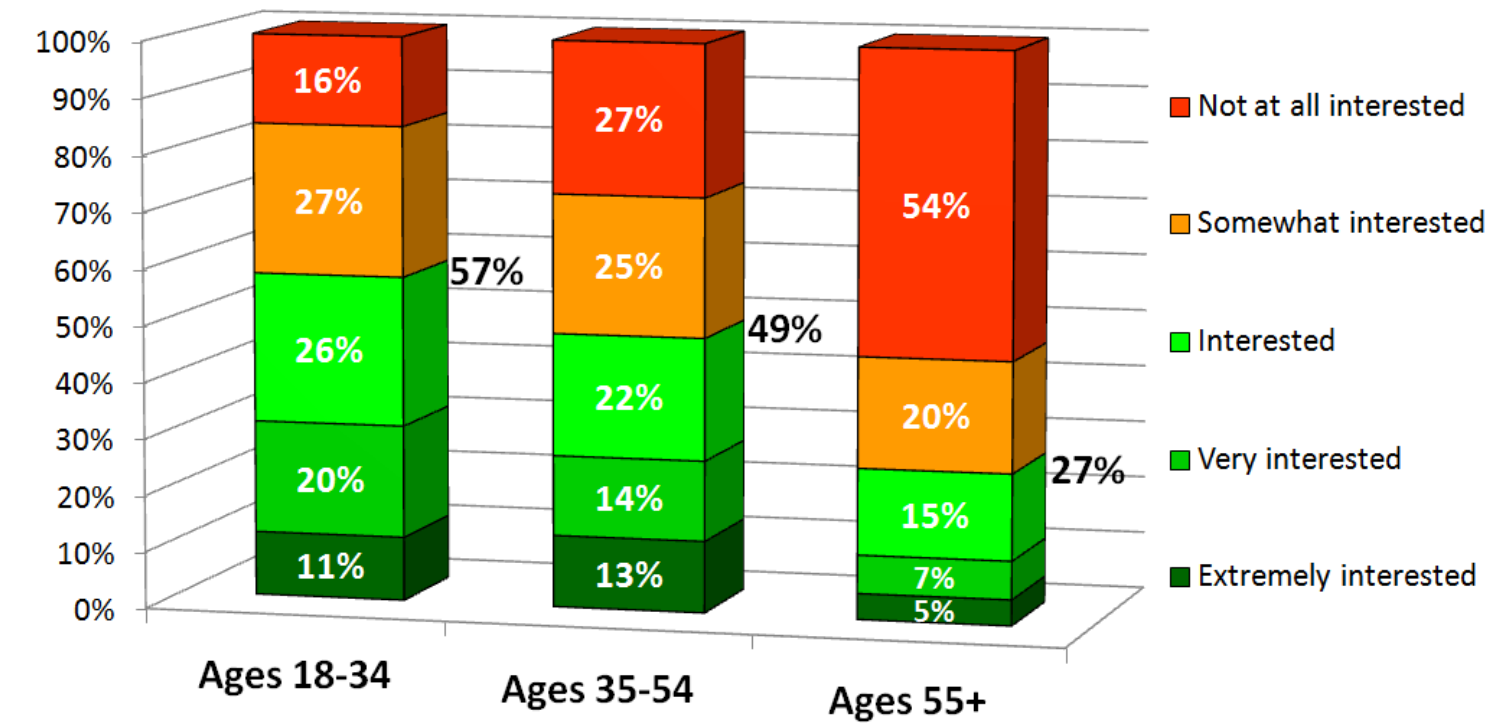
Customer segmentation by age reveals implications for program marketing and communications

Interest in Bar Code Payment Option
 DEFG’s Prepay Consumer Survey Report, 2019



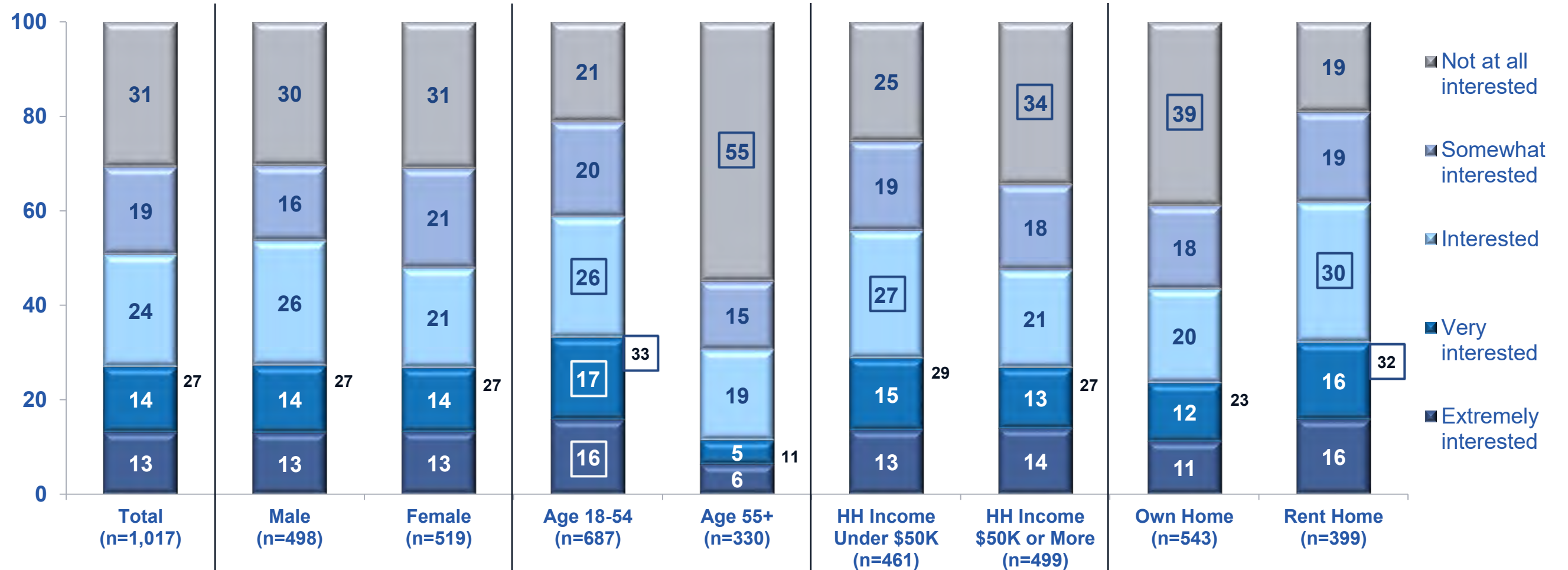
Q.15. If your local utility or provider were to offer a bar code option for consumers, how interested would you be?

Interest in “Pay by Day” Payment Option
 DEFG’s Prepay Consumer Survey Report, 2019



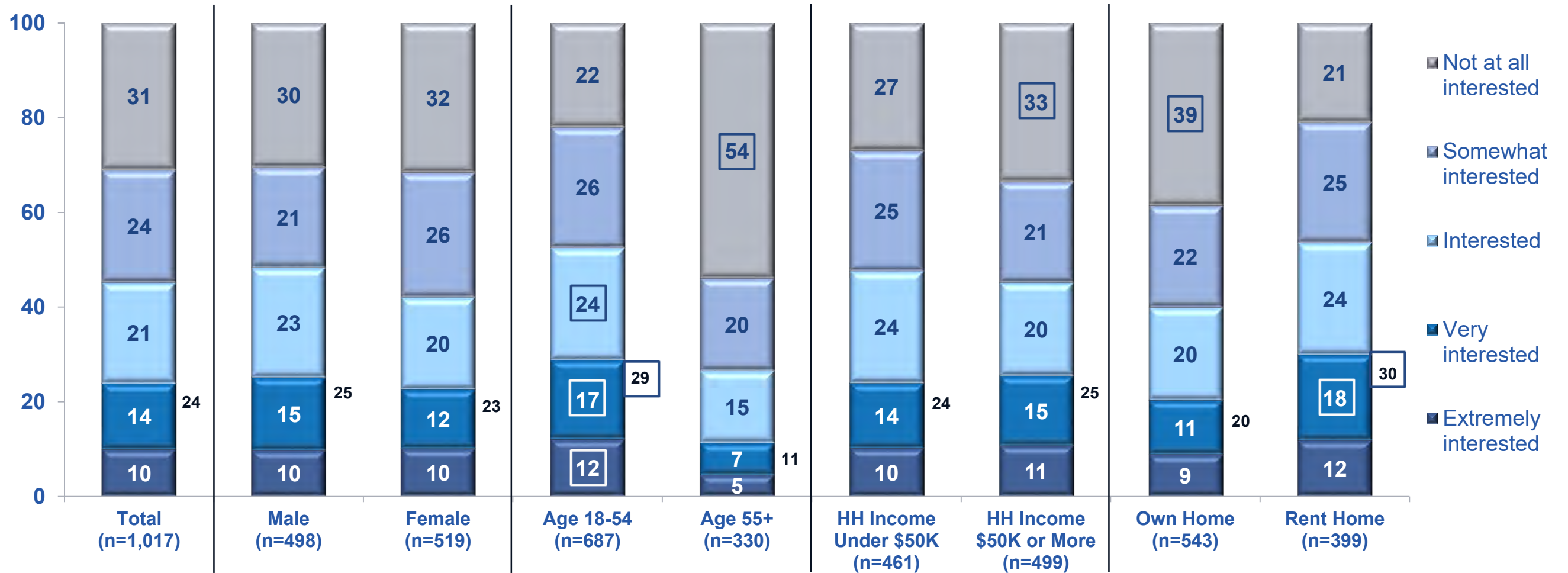
Q.16. If your local utility or provider were to offer a “pay by day” option for consumers, how interested would you be?

Interest in Bar Code Payment Option



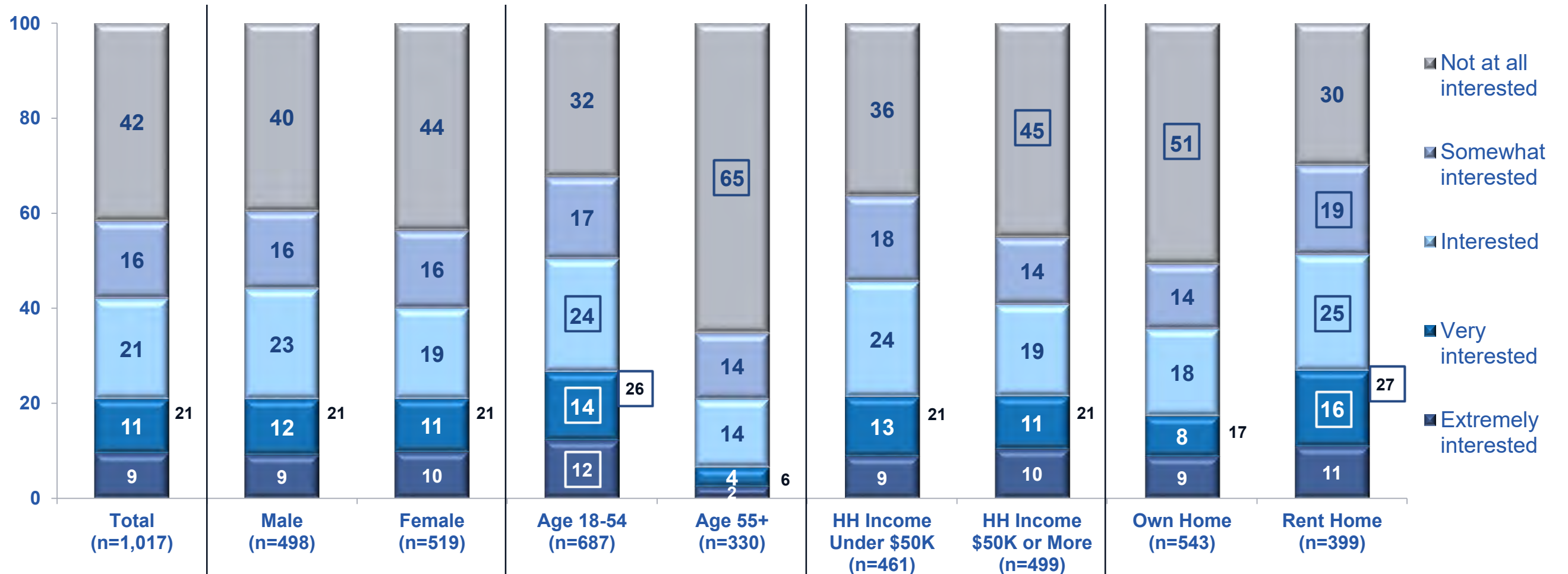
Base: Total Respondents. Q. B15 If your local utility or provider were to offer a bar code option for consumers, how interested would you be?

Interest in “Pay by Day” Payment Option



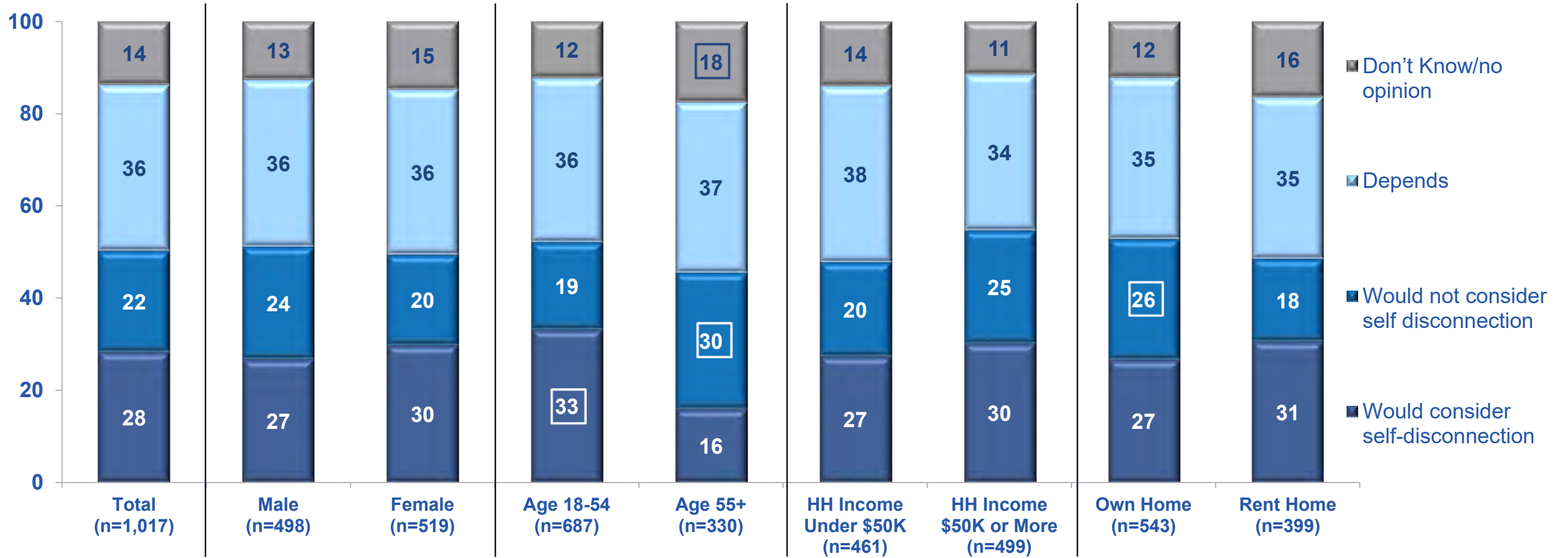
Base: Total Respondents. Q. B16 If your local utility or provider were to offer a “pay by day” option for consumers, how interested would you be?

Interest in “Text to Pay” Payment Option



Base: Total Respondents. Q. B17 If your local utility or provider were to offer a “text to pay” option for consumers, how interested would you be?

Ever Consider Self-Disconnection of Energy Service and Then Reconnect at Your Convenience if No Penalty/Fee



Base: Total Respondents. Q. B18 If you knew that your local utility could turn off your service and then restore your energy within minutes or on your schedule, and could do so without any penalty or any fee, would you ever consider self-disconnection (e.g., just letting your account reach a zero balance so that the service is turned off temporarily) to conserve energy (away for a weekend or as a reminder to put money on your account), and then reconnecting at your convenience?

Findings and Conclusion

Findings: Trends Analysis

Prepay continues to be part of a mega-trend, with a significant majority of Americans having used some sort of prepayment over the past year. However, the trend seems to be deflating (55% in 2019 vs. 62%) after years of explosive growth.

Yet, customer satisfaction with prepay remains high with customers either highly satisfied (39%) or somewhat satisfied (37%) with the option. Customer satisfaction with prepay continues to trend upward with another 2% increase of those customers “highly satisfied” from last year.

Interest in a voluntary prepay energy option offered by their local utility was a bit lower but basically the same as compared to last year, with customers indicating “extremely” or “very interested” totaling 20% in 2019 vs. 23% of Americans in 2018.

We track this number closely because these “extremely” or “very interested” consumers represent the addressable market. With approximately 150 million American consumers, this represents an addressable market of over 30 million.

39% of respondents in 2019 indicated they were “interested” or “somewhat interested” in a voluntary prepay energy offering. To engage these customers, education and marketing will be important.



Findings: Customer Questions and Preferences

Respondents were asked what features would be beneficial along with prepay energy. The top responses were:

- Tips for reducing energy costs (27%)
- A weekly or monthly budget view (17%)
- Help with reducing seasonal price fluctuations (17%)

The top payment preferences for the respondents were incentives from the utility (36%), convenience (34%), and control (32%). This is consistent with our past research.

Prepay energy is closely aligned with trends toward more mobile, incremental and automatic payments. When asked what payment options would be important if they chose prepay energy, the top responses were: make payments online/ on a website (63%), making payments on a smart phone or other electronic device (50%), and through automatic payments (36%).

One possible stumbling block for adoption of prepay energy would be customer concerns over any fees associated with the offering. 83% of the survey respondents indicated some level of concern over fees, with 43% being “very concerned” and 40% being “somewhat concerned.” Older Americans (55+) are especially concerned about fees.





Findings: Payment Frequency and Preferences

An interesting finding is that 77% of respondents thought that they would make 1 to 2 payments a month on their prepay energy account to keep current. Our research shows that the average frequency of payments is closer to 3 to 4 payments, especially if paying in cash.

When asked about the likely amount that they would put into their prepay energy account, there was an even split between those customers who would put over \$25 into their account (38%) and those would put less than \$25 into their account (38%). The remaining respondents didn't know how to answer.

A significant number of respondents indicated that it was either very likely (10%) or likely (23%) that they would experience a disconnection the first year of service on a prepay energy offering when their account balance hit zero. Also, 21% of respondents indicated that they didn't know how to respond to this question. The findings represents a much higher expected level than the actual number of customers experiencing a disconnect in the first year of service.

Respondents indicated that they may prefer more direct and immediate communications for a pending disconnect notice, with 39% desiring a text message, 28% an email, and 13% a phone call.

Perhaps not surprisingly, an overwhelming majority (83%) preferred notification of a day or more of a pending disconnection.

Findings: New Functionality and Options

We added new questions to gain a better understanding of what consumers may be interested in regard to new options that are either connected to, or build off of, prepay.

Consumers responded positively to a number of options offered. We paid special attention to the respondents that indicated they were either “extremely interested” or “very interested.” These two responses can be considered the easily addressable market with little to no marketing.

- ✓ **Going paperless.** 85% of respondents indicated some level of interest in not receiving paper bills or other information on paper. 32% were “extremely interested” and 19% “very interested.”
- ✓ **Bar code option.** 69% of respondents indicated some level of interest to pay using a bar code option when checking out at local stores. 13% were “extremely interested” and 14% were “very interested.”
- ✓ **Automatic recurring payments.** 68% of respondents indicated some level of interest in having an automatically recurring payment taken from their account. 13% were “extremely interested” and 15% “very interested.”
- ✓ **Pay by Day.** 69% of respondents indicated some level of interest in an option to pay the same fixed amount on a daily basis. 10% were “extremely interested” and 14% were “very interested.”
- ✓ **Text to Pay.** 58% of respondents indicated some level of interest in paying their utility bill via text. 9% were “extremely interested” and 11% were “very interested.”



Conclusion: Market Catching Up to Consumers

The 2019 survey findings clearly point to an upwards trend for adoption of prepay energy as a voluntary bill pay option in the USA. This trend is driven by consumer preference. While prepay energy is not everyone's preferred choice, there is ample evidence of increased customer satisfaction when the right customer is on the offering.

So, what is holding back the prepay energy market? Regulatory caution has certainly been a factor; however, that is quickly changing as the facts on the ground accumulate. Utilities have been cautious, with most prepay energy programs beginning as pilots. That too is changing.

Prepay energy requires a fairly large shift in mindset along with a good dose of imagination of what is possible. On one hand, prepay energy can be viewed as another bill pay option. On the other hand, prepay energy can be viewed as a game changer in regard to engaging customers and giving them much more control. That dynamic produces spectacular outcomes in terms of high customer satisfaction, significant reductions in energy consumption and lowering debt levels, to name a few.

Just think: almost one-third of Americans would consider self-disconnecting power. That fact alone turns a lot of traditional assumptions about the utility sector on their heads. A lot of pieces need to be in place for prepay energy to work. We are getting there quickly, mainly because customers are positively talking about the offering. The coming year should be a big one for the ripening of the prepay energy market.



Appendix - Demographics

DEMOGRAPHICS

| | <u>Total</u> | <u>Gender</u> | | <u>Age</u> | | <u>HH Income</u> | | <u>Home Ownership</u> | |
|---|--------------|---------------|---------------|--------------|------------|--------------------|----------------------|-----------------------|-------------|
| | | <u>Male</u> | <u>Female</u> | <u>18-54</u> | <u>55+</u> | <u>Under \$50K</u> | <u>\$50K or More</u> | <u>Own</u> | <u>Rent</u> |
| Total Respondents | (1,017) | (498) | (519) | (687) | (330) | (461) | (499) | (543) | (399) |
| | % | % | % | % | % | % | % | % | % |
| <u>Gender</u> | | | | | | | | | |
| Male | 49 | 100 | - | 49 | 49 | 44 | 55 | 52 | 45 |
| Female | 51 | - | 100 | 51 | 51 | 56 | 45 | 48 | 55 |
| <u>Mean Age</u> | | | | | | | | | |
| | 44.3 | 44.4 | 44.3 | 35.8 | 66.0 | 42.1 | 46.2 | 48.7 | 39.5 |
| <u>Marital Status</u> | | | | | | | | | |
| Married | 47 | 48 | 46 | 41 | 62 | 33 | 62 | 61 | 34 |
| Not Married | 52 | 51 | 53 | 58 | 38 | 66 | 37 | 38 | 66 |
| Refused | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| <u>Mean Household Size</u> | | | | | | | | | |
| | 2.8 | 2.8 | 2.9 | 3.1 | 2.1 | 2.7 | 2.9 | 2.8 | 2.7 |
| <u>Presence Of Children</u> | | | | | | | | | |
| Children Present | 36 | 31 | 41 | 46 | 11 | 35 | 39 | 37 | 35 |
| No children present | 64 | 69 | 59 | 54 | 89 | 65 | 61 | 63 | 65 |
| <u>Parent Of Children In Household</u> | | | | | | | | | |
| Parent | 31 | 26 | 36 | 41 | 5 | 29 | 34 | 34 | 30 |
| Not the parent | 69 | 74 | 64 | 59 | 95 | 71 | 66 | 66 | 70 |

DEMOGRAPHICS (CONT'D.)



Case No. U-21087
 Exhibit: AGCUB-Bunch4
 Date: January 20, 2022
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| | <u>Total</u> | <u>Gender</u> | | <u>Age</u> | | <u>HH Income</u> | | <u>Home Ownership</u> | |
|--------------------------|--------------|---------------|---------------|--------------|------------|--------------------|----------------------|-----------------------|-------------|
| | | <u>Male</u> | <u>Female</u> | <u>18-54</u> | <u>55+</u> | <u>Under \$50K</u> | <u>\$50K or More</u> | <u>Own</u> | <u>Rent</u> |
| Total Respondents | (1,017) | (498) | (519) | (687) | (330) | (461) | (499) | (543) | (399) |
| | % | % | % | % | % | % | % | % | % |
| Education | | | | | | | | | |
| College | 71 | 73 | 69 | 69 | 75 | 63 | 80 | 78 | 64 |
| No College | 29 | 27 | 30 | 30 | 25 | 37 | 19 | 22 | 35 |
| Refused | 0 | 0 | 0 | 0 | - | 0 | 0 | 0 | 0 |
| Employment | | | | | | | | | |
| Employed | 54 | 61 | 47 | 62 | 31 | 45 | 65 | 57 | 52 |
| Not Employed | 45 | 38 | 51 | 36 | 68 | 54 | 35 | 42 | 46 |
| Refused | 1 | 1 | 2 | 2 | 0 | 2 | 0 | 1 | 2 |
| Household Income | | | | | | | | | |
| Mean | 61.7 | 66.9 | 56.5 | 59.6 | 67.0 | 28.5 | 94.6 | 75.3 | 46.2 |
| Median | 50.2 | 56.6 | 46.0 | 47.2 | 58.3 | 28.9 | 82.7 | 66.8 | 38.6 |
| Home Ownership | | | | | | | | | |
| Rent | 38 | 35 | 41 | 44 | 22 | 52 | 26 | - | 100 |
| Own | 54 | 58 | 51 | 47 | 72 | 38 | 71 | 100 | - |
| Other | 7 | 7 | 8 | 8 | 5 | 10 | 3 | - | - |
| Type Of Community | | | | | | | | | |
| Urban | 25 | 23 | 27 | 27 | 21 | 30 | 21 | 17 | 38 |
| Suburban | 52 | 56 | 49 | 51 | 55 | 43 | 61 | 58 | 47 |
| Rural | 22 | 21 | 24 | 21 | 24 | 27 | 18 | 25 | 14 |

DEMOGRAPHICS (CONT'D.)



Case No. U-21087
 Exhibit: AGCUB-Bunch4
 Date: January 20, 2022
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| | <u>Total</u> | <u>Gender</u> | | <u>Age</u> | | <u>HH Income</u> | | <u>Home Ownership</u> | |
|--|--------------|---------------|---------------|--------------|------------|--------------------|----------------------|-----------------------|-------------|
| | | <u>Male</u> | <u>Female</u> | <u>18-54</u> | <u>55+</u> | <u>Under \$50K</u> | <u>\$50K or More</u> | <u>Own</u> | <u>Rent</u> |
| Total Respondents | (1,017) | (498) | (519) | (687) | (330) | (461) | (499) | (543) | (399) |
| | % | % | % | % | % | % | % | % | % |
| <u>Hispanic Origin Or Descent</u> | | | | | | | | | |
| Hispanic | 15 | 15 | 15 | 17 | 9 | 20 | 11 | 11 | 21 |
| Not Hispanic | 85 | 85 | 85 | 83 | 91 | 80 | 89 | 89 | 79 |
| Refused | 0 | 0 | - | 0 | - | - | 0 | 0 | - |
| <u>Ethnic Background</u> | | | | | | | | | |
| Caucasian | 74 | 73 | 74 | 71 | 82 | 74 | 75 | 80 | 66 |
| African-American | 12 | 12 | 13 | 12 | 12 | 12 | 13 | 10 | 16 |
| Asian/Pacific Islander | 5 | 6 | 5 | 7 | 2 | 3 | 7 | 4 | 7 |
| Other | 5 | 5 | 5 | 6 | 3 | 7 | 3 | 3 | 7 |
| Refused | 3 | 4 | 3 | 4 | 1 | 4 | 2 | 2 | 5 |
| <u>Political Affiliation</u> | | | | | | | | | |
| Democrat | 38 | 35 | 41 | 37 | 39 | 37 | 39 | 35 | 43 |
| Independent | 23 | 26 | 20 | 24 | 22 | 26 | 22 | 24 | 23 |
| Republican | 24 | 26 | 21 | 20 | 32 | 19 | 29 | 29 | 17 |
| Other Political Party | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 |
| Not registered to vote | 12 | 10 | 15 | 15 | 5 | 15 | 7 | 8 | 15 |
| <u>Census Region</u> | | | | | | | | | |
| Northeast | 19 | 19 | 20 | 19 | 20 | 16 | 23 | 19 | 21 |
| South | 36 | 35 | 36 | 36 | 36 | 40 | 32 | 38 | 32 |
| Midwest | 23 | 23 | 23 | 23 | 23 | 24 | 22 | 23 | 23 |
| West | 22 | 23 | 22 | 23 | 20 | 19 | 24 | 20 | 25 |

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DTE

PrePay Program Study Final Report

December 3, 2020



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Study Overview



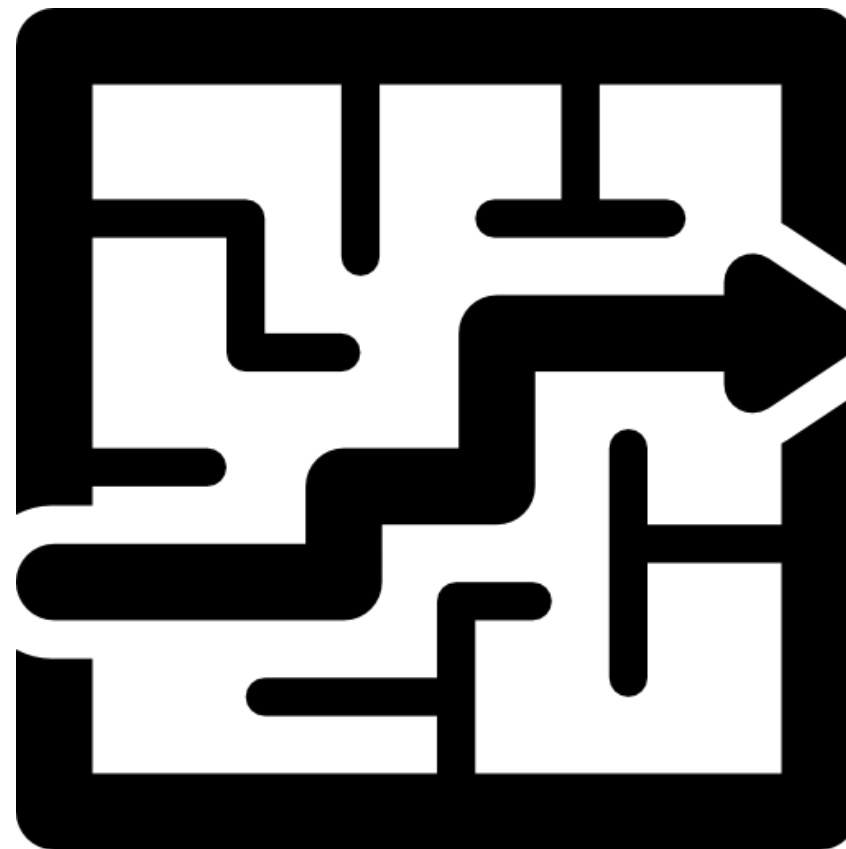
Study Background and Research Objectives

- ✦ DTE is exploring the possibility of offering customers a “PrePay” program that would function similar to a prepaid phone, where customers “load” funds into their account and then their usage is deducted from that account instead of the customer receiving a bill.
- ✦ Initial planning for this program suggests it will have its greatest appeal with customers who may have difficulty paying their bill, often because of an inconsistent income stream.
- ✦ This research had four primary objectives:
 - ✦ Gauge target customer reactions to the new program
 - ✦ Confirm customers’ ability to understand specific elements of the new program
 - ✦ Uncover any areas of confusion or missing information necessary for decision making
 - ✦ Explore ways DTE can add legitimacy and appeal to the program

Sample and Methodology

- ♥ Five Zoom-based, 75-minute focus group discussions with 28 target customers from within DTE's electric service territory.
 - ♥ Recent turn-on for household within 200% of FPL (2 groups)
 - ♥ Recent restore
 - ♥ Recently missed payment
 - ♥ Moderate income / Missed payment
- ♥ All respondents were also recruited to match these customer characteristics:
 - ♥ Age 18-72
 - ♥ No employment in utilities or market research
 - ♥ Decision maker for utilities in the household
 - ♥ Correct identification of DTE service
 - ♥ Able to connect via computer or other device that includes a webcam and speaker
 - ♥ Maximum of 3 renters per group

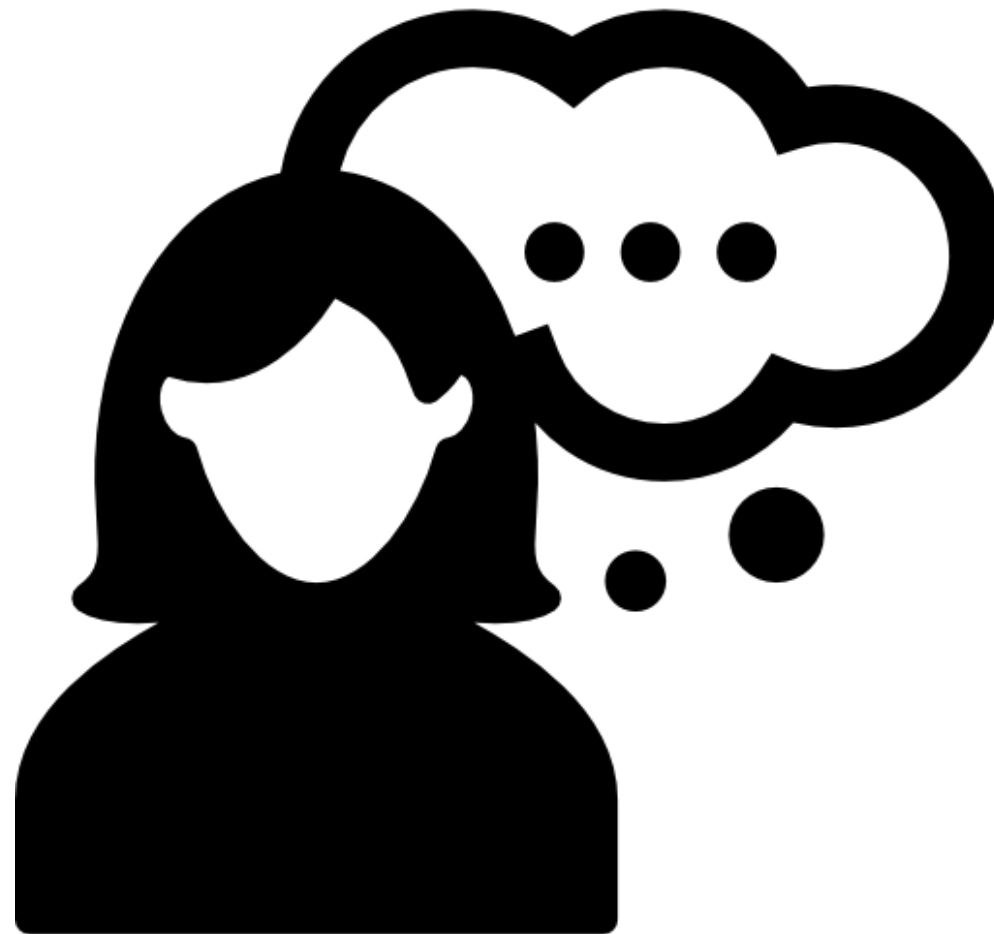
Knowledge of Billing and Assistance Options



This audience has very limited specific awareness of DTE’s options relating to rates, billing, or assistance—but there was a sense that the company would work with someone in distress rather than simply demanding payment in full.

- ✦ Out of all five groups, there was only one customer who was aware of any options relating to residential electric rates—a lone customer already participating in Dynamic Peak Pricing.
- ✦ Most equated electric service from DTE as a binary on/off choice—if you want electricity, you sign up with DTE and pay the same rate as anyone else.
- ✦ A few recognized BudgetWise Billing as an option, although as we see often in qualitative discussions, customers often confuse BWB with a customized payment plan to address an account in arrears rather than recognizing it as an ongoing strategy for evening out fluctuations in a bill.
- ✦ Similarly, a few were aware there was an option to shift their monthly billing due date once or twice per year.
- ✦ In spite of this limited knowledge relating to rates and billing options, these groups were generally optimistic about DTE’s willingness to work with customers who run into financial difficulties that prevent them from paying their bill in full:
 - ✦ Shut-off protection
 - ✦ Payment plans to gradually eliminate arrears
 - ✦ Referrals to social service agencies and other outside payment assistance sources

Initial Reactions to Concept



The DTE PrePay program was presented to respondents via the following description:

- ✦ The overview may not accurately reflect every aspect of the new program, but it provided enough elements to test the general concept.
- ✦ After initially seeing the concept and a chart comparing it to post-pay, it was removed and respondents were asked to relay its general content and benefits to measure clarity of the description and perceived return on investment for customers.
- ✦ The concept was then re-displayed and an in-depth discussion took place.

A DTE Prepay Program would be an alternative payment option in which customers buy a dollar amount of electricity, and DTE deducts energy usage from that balance as it is used.

They can add money to their account in multiple ways—by paying at a kiosk, online, by phone, or even at third party payment locations such as grocery stores.

Customers can set up their account to receive frequent notifications about their balance via phone, email, and/or text message, plus additional alerts when they reach a low or zero balance.

A zero balance could result in disconnection (which typically occurs after a 2-5 day grace period); service is reestablished a few minutes or hours after a payment is received.

DTE's prepay program also provides new protections to prevent disconnections from occurring on weekends, holidays, or days with extreme temperatures.



Respondents also saw this comparison chart comparing the PrePay Plan to Traditional PostPay

| Plan Details | Traditional (Postpay) | Prepay* |
|---|--|--|
| Initial Deposit | Variable depending on type of service and amount of arrears (if any) | ~\$25 toward prepayment balance; Estimated 7-10 days of energy |
| Minimum Payment | Full monthly bill by due date | Estimated 7-10 days of energy |
| Additional Admin Fees | None | None |
| Late Payment Fees | Variable % of overdue amount | None |
| Disconnection or Reconnection Fees | Must pay all disconnect / reconnect fees, delinquent bills and collection fees | None |
| Transaction Fees | None | None |
| Ability to exit and switch to other plan | Yes | Yes |
| Disconnection Procedure | Notice of Intent to Disconnect sent after failure to pay full monthly bill by due date; can be disconnected immediately after receipt of shut-off notice | Multiple alerts of balance/days remaining of energy; 2-5 day payment grace period for clearing of mailed checks; Shutoff protection (not on weekends, holidays, or days with extreme temperatures) |
| Reconnection Procedure | Customer must pay all disconnect / reconnect fees, delinquent bills and collection fees to re-establish connection | Make minimum payment + any unbilled usage within payment grace period or program de-enrollment period |

Respondents easily understood the basics of the PrePay Plan, but had a few concerns around the size and frequency of required “seeding” of the account.

- ✦ Customer “play back” of program details after initial presentation and removal were consistent and strong.
 - ✦ Respondents understood this a chance to add money to an ongoing account when possible that would then offset electric usage.
 - ✦ Usage/low balance messages would be communicated to subscribers to help them keep a reasonable balance in the account.
 - ✦ Disconnection for non-payment would happen after a 2-5 day grace period, with some shutoff protections on weekends, holidays, and extreme weather days.
 - ✦ Reconnections will be faster and require less money than with a traditional post-pay account.
- ✦ Questions/areas of confusion usually centered around required dollar amounts and frequency of account replenishment
 - ✦ The \$25 minimum wasn’t clear to some respondents, who wondered whether a customer could add more money than that and whether amounts had to be in \$25 increments.
 - ✦ The “7-10 days of energy” had both positive (minimum required investment) and negative (my power is out in about a week unless I add more money) connotations as a point of reference, potentially increasing customers’ sense of financial insecurity within the program in spite of demonstrating a lower cost of entry for the program.
- ✦ There were no consistent missing “pieces” of the program that customers felt they needed to see before making a decision on whether or not to join the program, although a few wanted confirmation that their actual electric rate wasn’t higher than what they would pay with a post-pay account.
- ✦ Also, customers wanted some control over the frequency as well as the mode of reminders from DTE as their account diminishes.
- ✦ Customers noticed and appreciated the ability to switch into and out of the PrePay program without penalty or restrictions.

Understanding the PrePay plan's appeal requires a nuanced understanding of the potential subscriber and their financial behavior.

- ✦ Within these discussions there were a set of customers who tend to truly live “in the financial moment.”
- ✦ For these customers, income comes in and leaves almost immediately, with little or no forward planning—in many cases not because they are eagerly “blowing” the money on superfluous things, but instead because their income is likely insufficient to provide adequate, consistent financial stability for their household.
- ✦ These customers were often in hourly or other variable rate positions without adequate guarantees of consistent income month-to-month.
- ✦ They have developed a pattern of “juggling” bill payment to push their payments to the absolute last possible point without actually having services discontinued (although the conversation made it clear that shut-offs across a range of household and personal services were not an uncommon occurrence).
- ✦ It is important to understand that their behaviors are not “gaming” per se—no one is enjoying the activity, which involves significant stress and personal energy in a high stakes shuffle that often results in quick failures and associated reconnection costs.
- ✦ These customers have a very low sense of control over their lives and feel financially beholden to outside entities.
- ✦ Customers with this mindset likely have no reserves at all and often seemed incapable of setting money aside for even short periods of time in anticipation of normal, recurring bills—one respondent described a switch from a job that paid weekly to a new job that paid bi-weekly as a challenging financial transition (suggesting she had less than one week's cash reserves on hand at any time).

In this context, customer arguments for switching to the PrePay program almost always centered on a perception of increased control for the customer.

- Recognizing that a “good week” can sometimes result in more income than usual (think a waitress who comes home from a night of surprisingly generous tips), these customers saw PrePay as a chance to inject money into their DTE account to assure continuous electric service even if income later in the month falls unexpectedly—letting them reserve their energy later to juggle other bills with the confidence that at least their electricity will stay on.
- In this context, PrePay becomes a way for the customer to increase their control over when they pay DTE and how much they pay—so money goes to the utility when the customers have it rather than on an arbitrary billing date controlled by DTE.
- A few even hoped that switching to PrePay would help them monitor their electricity consumption more actively and potentially reduce the “burn rate” as a result, perhaps extending the benefit of an initial pre-payment into their DTE account even longer than they had anticipated.
- Surprisingly, avoidance of reconnection fees and fines was not seen as a highly motivating factor to switch to PrePay—in may be that this audience that regularly experiences disconnections and reconnections for a variety of household services is largely numb to these added expenses because they are seen as a common and unavoidable cost of retaining desired services.

Younger customers with non-related roommates also liked PrePay as a way of “encouraging” equal contributions and a conservation mindset across their household.

- ✦ College students and young professionals sharing space recognized that utility bills can be an area of friction with roommates.
- ✦ Disagreements are often driven by two things:
 - ✦ An unwillingness by some roommates to contribute to a bill that is quickly becoming due
 - ✦ A disregard for energy consumption by one roommate that drives up the cost for all members of the household
- ✦ These young adults saw PrePay as a mechanism that could help overcome these two situations by forcing a significant contribution by all roommates in advance of actually consuming the electricity—and perhaps an opportunity to encourage more conservation-oriented behavior from roommates who may be more prone to make adjustments when they can see their money declining in their DTE account as they consume electricity.

The PrePay program was almost always rejected for one of two reasons: increasing necessary mental energy and/or tying up resources that could be used for other household needs.

- ❖ For customers on auto-pay and/or BWB, the plan had very little appeal.
 - ❖ Even some of these customers with modest incomes are in financially stable situations—they are organized and budget effectively.
 - ❖ Recurring bills like utilities are handled without incident most months and the customers do not have a high level of stress associated with making their monthly payment.
 - ❖ For these customers, switching to a PrePay plan means a bill that doesn't need their attention now requires they track an account to make sure adequate funds are in place at all times—the certainty of a monthly due date gets replaced with an unpredictable “refill” date.
- ❖ These financial planners were quick to recognize that DTE gains control of their money faster in PrePay program.
 - ❖ In contrast to the “hand to mouth” customers who saw PrePay as a control tool, these customers saw PrePay as a program that ties up their money prematurely.
 - ❖ At best, this is money that could be working for the customer instead of generating interest revenue for DTE during the time between when it goes into the account and when the customer has it applied to their electric usage.
 - ❖ At worst, this is money that might be used to juggle expenses and extend income for other avenues of the household's monthly budget: in this case, customers would rather hold as many dollars as possible against unexpected expenses and only commit funds to DTE to cover their actual usage during a given month.
- ❖ As a result of recognizing DTE's earlier control of their money, the only possibility some of these customers saw for considering the PrePay program would be if it provided ongoing discounts to their electricity bill as a trade-off for paying early (respondents often cited auto insurance companies' discounts for lump sum early payment of premiums as a reasonably analogous situation).

In addition, some customers thought PrePay provided significantly less flexibility for them in an arrears situation than a conventional post-pay plan.

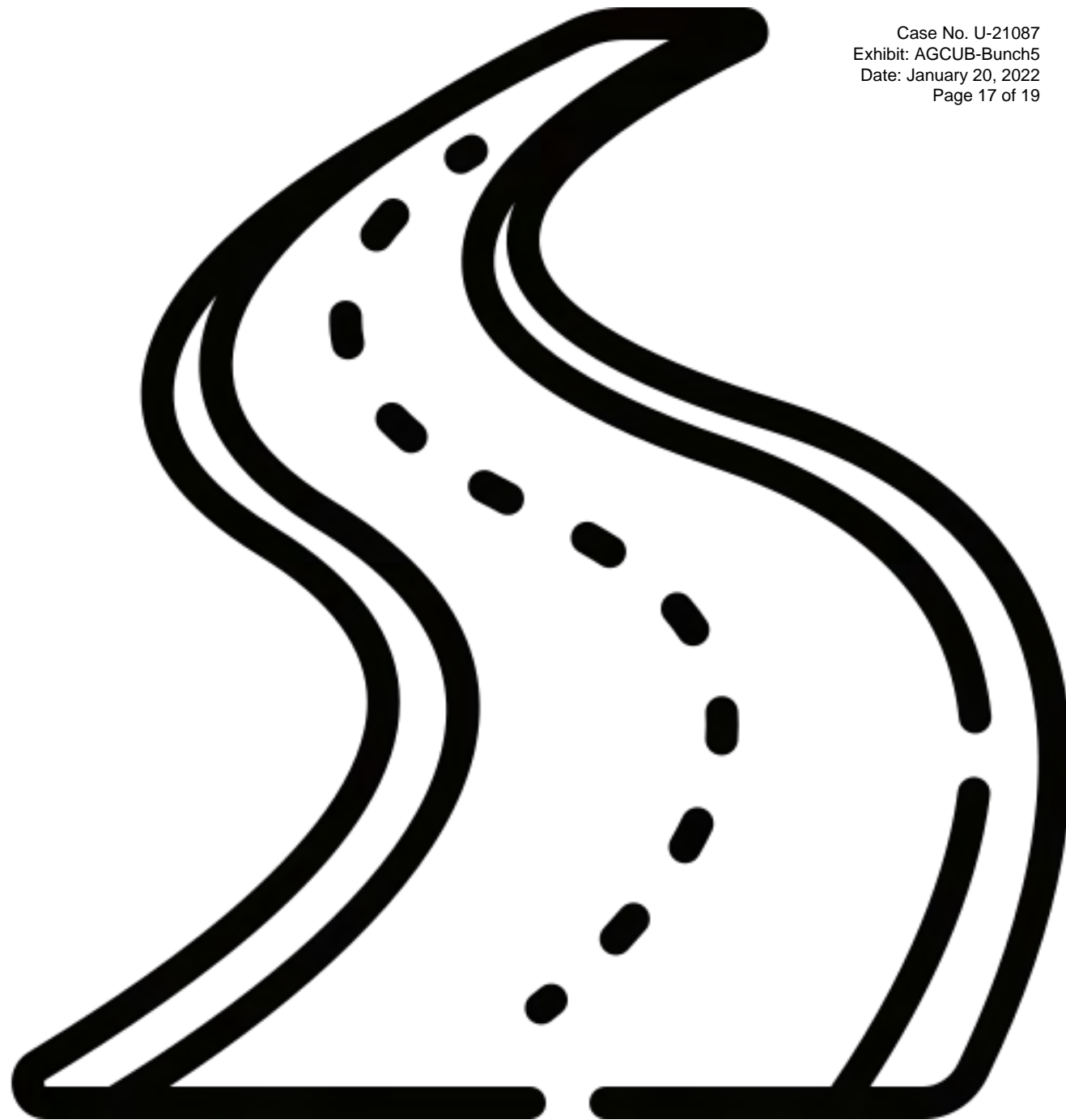
- ✚ This type of respondent tended to be financially unstable but more experienced at “creative extension” in their household billing strategies.
- ✚ These customers rejected PrePay because they believed their current post-pay plan actually provided a longer grace period before they had to face a shut-off.
- ✚ These customers typically estimated their ability to stretch an arrears situation as a post-pay customer to almost two months before exhausting their options if necessary.
- ✚ In contrast, they viewed the PrePay program’s 2-5 day grace period as inadequate and potentially disastrous if they lacked the ability to refund their DTE account within that time period—again, their focus was on maintaining their electric service for as long as possible in an arrears position, not in avoiding disconnection fines or reconnection fees.

Four potential program promotions were assessed during the discussions:

- ♥ DTE waives the required \$25 initial deposit requirement
- ♥ DTE adds the first \$25 to new accounts
- ♥ DTE provides new customers with a \$25 VISA gift card
- ♥ DTE adds \$5 to PrePay customers' accounts for every \$100 they add to it

- ♥ Because the reasons for and against signing up for a PrePay plan were consistently focused on recurring financial themes and issues, minor “spiffs” for shifting to the plan had very limited appeal, even among our lowest income respondents.
 - ♥ Of the three one-time offers, contributing \$25 to the customer’s account was by far the most popular because it reduces the customer’s first bill right off the top.
 - ♥ The VISA gift card had a few proponents because of its flexibility, but most rejected it as adding an extra step with a bonus that is harder to use.
 - ♥ Waiving the \$25 deposit was summarily dismissed because it did not represent a discount—and given the nature of the program, a customer would have to quickly roll his/her own money into the account anyway or risk a quick shutoff.
- ♥ After the first few groups, we added the fourth option to subsequent discussions, only introduced after the first three options had been discussed.
- ♥ Not surprisingly, the structure of this offer was much preferred because it offered ongoing discounts to participating customers in exchange for giving DTE early control of their funds—unfortunately, customers did not see a 5% discount as a worthy counterpoint to losing control of their money earlier in the process (customers typically needed discounts closer to 20% before they would consider shifting programs).

Broad Conclusions and Next Steps



In the end, about 1 in 5 of those targeted to participate in these discussions expressed an interest in exploring PrePay as a payment option.

♥ These customers shared some common traits:

- ♥ Younger than 35
- ♥ Financially unstable
- ♥ In occupations or situations marked by erratic income
- ♥ Single income households
- ♥ DTE accounts shared by unrelated individuals
- ♥ Often renting or in low-value housing stock such as mobile homes
- ♥ Less experienced with DTE arrears recovery options and programs
- ♥ Craving a way to control when and how much they contribute to DTE for their electricity
- ♥ Interested in ways to monitor and reduce their consumption (cost) of electricity

PrePay should be positioned to these customers as a mechanism by which its subscribers can gain greater control over their energy bill—not as a way to avoid financial penalties in the case of failure.

- ✦ Customers who were most intrigued by this program were individuals who rarely feel they have adequate control over their lives, especially when it comes to finances.
- ✦ PrePay has a potential to increase that sense of control in two ways:
 - ✦ The customer decides when and by how much they will fund their DTE account.
 - ✦ By tracking their declining balance, they have an opportunity to reduce electric consumption by connecting their actions to how much they have to pay DTE every month.
- ✦ Talking about PrePay as a way to increase control provides a positive message that addresses a highly salient concern for these customers—a concern that extends well beyond their electric bill.
- ✦ Although these customers often end up paying more for many household services than other higher income households over the long haul when penalties and reconnection fees are factored in, the reality is that they are not motivated by an ability to avoid those punitive fees because they see those as a general cost of maintaining necessary services in light of their erratic and inadequate income.

Exhibit U-21087-AGCUB-Bunch6
 Witness Richard Bunch

| Data Year | Utility Name | Thousand Dollars | Megawatt hours | Count | MWh/ customer | one-year change | two-year change |
|-----------|----------------------|------------------|----------------|-----------|------------------|--------------------|--------------------|
| 2013 | DTE Electric Company | 2,350,797.8 | 15,273,084 | 1,936,236 | 7.888 | | |
| 2014 | DTE Electric Company | 2,177,593.0 | 14,932,840 | 1,943,880 | 7.682 | -2.6% | |
| 2015 | DTE Electric Company | 2,186,182.0 | 15,028,789 | 1,953,735 | 7.692 | 0.1% | -2.5% |

source: US Energy Information Administration



Cutting back, cutting down, cutting off

Self-disconnection among prepayment meter users

Hannah Mummery, Holly Reilly



About Consumer Focus

Consumer Focus is the consumer champion for England, Wales, Scotland and (for postal consumers) Northern Ireland.

We operate across the whole of the economy, persuading businesses and public services to put consumers at the heart of what they do.

Consumer Focus gives a strong voice to consumers on the issues that matter to them and works to secure a fair deal on their behalf.

We work with consumers and a range of organisations to tackle the problems customers face and to achieve creative solutions that make a difference to people's lives.

Foreword

We all know that in the current economic climate people have to make sacrifices. But it is those on the lowest incomes who are often the hardest hit. It is almost unimaginable but even in our comparatively affluent society, some people face a decision every day about whether to spend money on food or heating – they cannot afford both.

We estimate 8.8 million¹ people in Great Britain live in homes where they pay for their energy through a prepayment meter (PPM) and the meters are becoming more common. Last year around 2,000² PPMs were installed every working day. Our research showed that, people who live in PPM households were among the poorest and most vulnerable. Almost half of households that disconnect their energy are home to someone with an illness or disability.

PPMs are used by energy suppliers as an alternative to disconnection, and routinely fitted to recover outstanding bills. As the financial crisis worsened, we were worried that more and more consumers with PPMs are going without electricity or gas (self-disconnection) – even in the coldest months of the year. This research sought to understand the extent of self-disconnection among PPM users and the effects it can have.

In our research, the majority of households welcomed their PPMs for the control they offer over budgeting and debt. This control comes at a price of inconvenience in managing and topping-up meters.

Some consumers resorted to going without heating or even the most basic of everyday essentials to ensure they have enough money to keep their meter topped up. For some households this is an ongoing struggle. Around 16 per cent of PPM users self-disconnect at least once a year; that could affect as many as 1.4 million people; some of them highly vulnerable.

At the heart of the matter is the fact that many people with PPMs just don't have enough money. They are not alone in that situation, but the difference is in the immediacy of the problem. People using credit meters have months to plan, save and to work with suppliers to manage debt. People on prepayment meters face the challenge on a daily basis and face immediate disconnection if they cannot manage to recharge the meter.

Although popular with many users our research uncovered a multitude of frustrations experienced by PPM customers about the way their meters work. PPMs are often viewed as inconvenient and out of date when compared with other pay as you go technology such as mobile phones. Energy suppliers have failed to keep up with modern technological advances that would improve the experience of PPM use for existing and potential consumers.

We have identified a number of relatively simple actions that should be made by suppliers, Government and Consumer Focus to improve the way PPMs work for everyone. These include:

- Improving existing written communications
- Making a concerted effort to improve the availability and quality of advice and support
- Conducting a concerted campaign to advise PPM users of their rights
- Where vulnerability is evident or established, suppliers should take every effort to ensure that a PPM remains the most suitable payment option

To see all our recommendations see page 39. These changes could help to reduce the number of self-disconnections that occur simply because consumers find PPMs in their current form inconvenient and incompatible with their lifestyles.

Mike O'Connor
Chief Executive

¹ Based on 3.7m electricity PPM customers (Ofgem Company Performance stats Q3 2009) and average (mean household) size (persons per household) of 2.37 (Regional Trends January 2010 ONS).

² Ofgem Company Performance stats Q3 2009

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Executive summary

Prepayment meters

With increasing numbers of prepayment meters (PPMs) being installed for debt collection and a difficult economic climate, Consumer Focus was concerned that some consumers could be self-disconnecting from their gas or electricity because of lack of money. As part of our wider project on debt and disconnection in the energy industry, this research was intended to understand extent and effects of self-disconnection.

There are more than six million PPM customers in Great Britain, of which 3.7 million are electricity customers and 2.5 million are gas customers². Increasingly, the main reason for PPM installation is debt recovery. Last year an estimated 442,000 meters were installed because of debt, more than 1,200 every day. This appears to be a growing problem.

What is 'self-disconnection'

It is defined as interruption to electricity or gas supply by consumers using prepayment meters because the card or key has not been charged and inserted into the meter. An associated issue is 'self-rationing', where customers limit either energy use to save money, or restrict spend in other areas to ensure sufficient funds are available to keep the PPM topped-up. Self-disconnection and self-rationing can have significant consequences for the health and wellbeing of consumers.

Household income

The annual household income of PPM households was markedly lower than in those households without one. Of those with a PPM, 60 per cent had a household income of less than £17,500 compared to 38 per cent of those without. More than half received some kind of means-tested benefit, or disability benefit, and the chief income provider did not have a job in just under half of cases. Over one-third of PPM households were home to someone with a long-term physical or mental health condition or a disability.

A popular payment method despite problems

The research confirmed that prepayment is generally a popular way of paying for gas or electricity (half of all users were 'satisfied'), as it allows consumers to feel in control of their budgets, and debt repayment can be done in a manageable way.

However PPM users felt they had flaws, such as:

- A gap in information about how PPMs work
- A perceived lack of information on outstanding debt repayments
- A lack of options for topping-up the PPM

Households with PPMs often had to make a low income go a long way.

² <http://bit.ly/dxopV8> [PDF Accessed 30 March 2010]

PPM households took a number of steps to limit money spent on topping-up the meter or to make existing credit last longer. These included delaying topping-up by using emergency credit, rationing energy or money, and at the more extreme end of the scale, self-disconnection. This has physical, emotional and psychological impacts on consumers.

Half of consumers are self-rationing their energy use or other outgoings

This often involves cutting back on everyday essentials and/or energy in a way that has an impact on their quality of life. This can mean cutting back expenditure on food and leisure or not using the heating.

Around one sixth of consumers are self-disconnecting

Within this group, there are different types of self-disconnections. Most are infrequent and short, often occurring due to lack of organisation ie forgetting to top-up the meter. There is however a small hardcore for whom keeping the meter topped-up is an ongoing struggle.

The most financially constrained households were self-disconnecting for the longest

While some consumers are stoical about self-disconnection, for the majority there are clear negative impacts to health and wellbeing, even when the disconnection is short-lived. Many respondents found being disconnected stressful, and for a few, it made existing depression worse.

Consumers who were self-disconnecting had mixed experiences when trying to contact their supplier for assistance. They were rarely aware of organisations such as Consumer Direct and Citizens Advice that could offer support or advice.

Smart meters are a key opportunity

The roll-out of smart meters is a key opportunity to address a number of the problems reported by consumers with PPMs, such as a lack of options for topping-up and relatively high prices.

PPM is not suitable for a small number of consumers

There remain a small number of vulnerable consumers, identified by the qualitative research, for whom PPMs are not suitable and who suffer high levels of detriment.



Section 1: Using prepayment meters

Who uses PPMs?

Around an eighth of GB households used PPMs

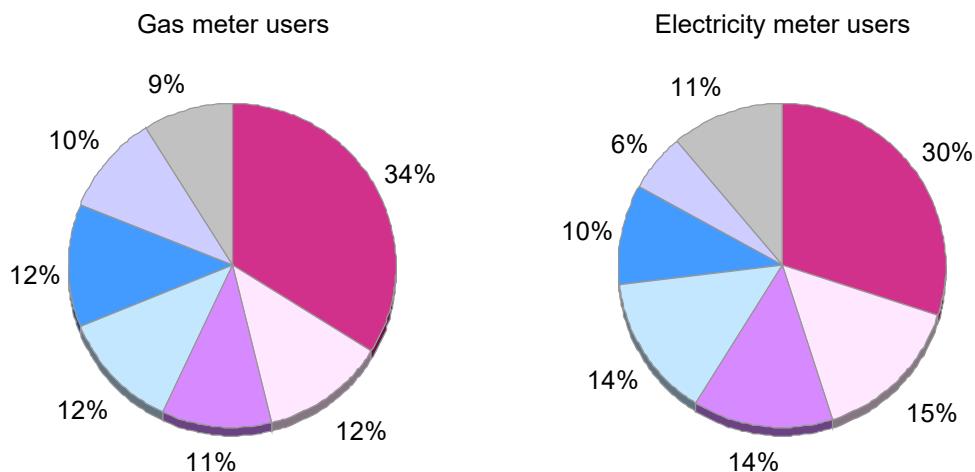
13 per cent of GB households surveyed had one or more prepayment meters in use, with a slightly higher proportion of electricity than gas meters. The two meter types were present in 11 and 9 per cent of homes, respectively. This is in line with Ofgem's Social Monitoring Statistics³, which state that 13 per cent of all energy customers pay for their gas and/or electricity by PPM.

Almost two-thirds of PPM households paid for both gas and electricity via a PPM.

The graph below shows which energy suppliers PPM households we surveyed were supplied by.

Figure 1: Gas and electricity suppliers

- British Gas/ Scottish Gas/ Nwy Prydain
- Scottish & Southern Energy/ SWALEC/ Southern Electric/ Scottish Hydro/ Atlantic Gas & Electricity
- EDF Energy ■ E.ON ■ npower ■ ScottishPower ■ Other/ Don't know



Base: All households with PPM (718); Households with gas PPM (227); Households with electricity PPM (491)

³ Ofgem Social Monitoring Statistics, Q3, 2009

Households with PPMs were typically on low incomes and in rented accommodation

Households with PPMs had relatively low incomes. More than half received some kind of means-tested benefit, or benefits for disability such as Disability Living Allowance⁴. The chief income provider did not have a job in just under half of cases. More than four in 10 PPM households were rented from a local authority or housing association. Privately rented households accounted for 15 per cent of PPM households.

Over one-third of PPM households were home to someone with a long-term physical or mental health condition or a disability, with asthma being reported most frequently. Mental health issues such as depression were mentioned by 9 per cent of respondents.

Energy efficiency measures in PPM households

A high proportion (81 per cent) of PPM households had one or more energy efficiency measures in place; double glazing was mentioned most frequently (72 per cent), although nearly two-thirds (64 per cent) of those living in houses mentioned having loft insulation.

PPM households renting from a private landlord were significantly less likely to report any energy efficiency measures than those renting from a local authority (LA) or housing association (HA), or privately owned properties. The contrast between the different property tenures is shown below:

Table 1: Presence of different energy efficiency measures, by property tenure
 (Base: 718 PPM households)

| Energy efficiency measure | Privately owned | Rented from LA or HA | Rented from private landlord |
|----------------------------------|-----------------|----------------------|------------------------------|
| Double glazing | 80% | 76% | 54% |
| Loft insulation (in houses) | 75% | 71% | 40% |
| Cavity wall insulation | 43% | 37% | 17% |
| A new boiler in the last 5 years | 41% | 31% | 20% |
| Any measures | 89% | 85% | 67% |
| | | | |

⁴ Disability Living Allowance (DLA) is a tax-free benefit for people who have a mental or physical disability and need someone to help look after them, or have walking difficulties. It is not means-tested. For more information see: <http://bit.ly/9CJ88N>

The difference in the levels of the energy efficiency measures between tenure may be explained in part by private landlords' reluctance to increase the efficiency of rental properties when they will not see any return on their investment, but may also simply reflect a lack of awareness by tenants, of what measures are in the property.

Overall PPM users liked their meter and felt the benefits often outweighed the disadvantages

There was a generally positive attitude to having a PPM, with half of all users 'satisfied' and a minority – around one seventh – 'dissatisfied.' PPMs helped households to manage finances, particularly those on the lowest incomes and gave them the peace of mind of knowing they would not receive bills for metered energy.

The predominant reason, given by just over two-thirds of these relatively low-income households, for satisfaction with their PPM was that it helped them manage their finances and budget (67 per cent of satisfied PPM households). The second most commonly cited reason for satisfaction was closely related – just over one-third (35 per cent of satisfied PPM households) liked the security and peace of mind that comes from knowing that they will not receive an unexpectedly large bill.

'You always like to know what you are spending, especially now when I know so many people in this weather are spending hundreds and hundreds. If the money is not there, it isn't there.' Male, 25-34, South East England

Dissatisfaction was due above all else to the PPM being perceived to be 'too expensive.' This is not unreasonable given that despite recent reductions in the price of PPM tariffs, prepayment remains along with paying by cash and by cheque one of the most expensive payment methods. Dual fuel PPM customers continue to pay on average £81 more than those paying by direct debit.

The qualitative research also captured some other issues which affect the perceived cost of energy through a PPM. These included an almost total lack of awareness of any standing charges and, among a few gas PPM customers, a belief that the tariff is higher when in 'emergency credit.' Several PPM households simply could not understand how they used so much credit, so quickly.

'I am not too aware actually. Sometimes when I put money on the card it does take off a little amount, but I am not sure what it is. I am not sure if it is a fixed thing. I wasn't sure what it was.' Female, 25-34, South East England

Dissatisfied users also found topping-up and managing the meter inconvenient, along with the fact that they could be disconnected from their energy supply if credit was not added.

Households repaying debt through their PPM also expressed dissatisfaction with the lack of clarity over how much debt was outstanding and the absence of statements to keep them updated. One customer was even paying a debt that she did not believe to be hers, but had been unable to resolve the issue with her supplier and had therefore agreed to pay it.

'I haven't a clue. I should ring them really. I am afraid to ring them in case they tell me I have got to pay more. I have got to do something else.'

Female, 35-44, Wales

However, the perceived benefits of being able to budget flexibly, on a daily basis if necessary, by using a PPM were strong enough to overcome many of its disadvantages. Even some dissatisfied customers valued the control afforded to them by having a PPM and, given the choice, would not have swapped to a standard credit meter.

PPMs were frequently 'inherited'. Few customers felt that their supplier had 'forced' them to have a PPM

Around a third of PPMs had been 'inherited' (installed before the current occupants lived at the property) by consumers who were sufficiently happy using it that they had not contacted the supplier to request the meter be removed. In nearly one in three cases, the PPM had been installed by a landlord, and the occupier was not allowed to change or remove it. Only a tiny proportion of PPM households had ever asked their supplier to remove the meter, or to discuss moving to a credit meter. Those who had made efforts to have their PPMs replaced with a standard credit meter often found this was not possible, due to the fact that a number of suppliers routinely charge fees to replace a PPM with a credit meter or require a security deposit. The in-depth interviews revealed that some customers are unable or unwilling to pay these fees.

'It was here when I moved in. I called up the company to get meters uninstalled but I can't afford that because I am not working.'

Female, 18-24, Scotland

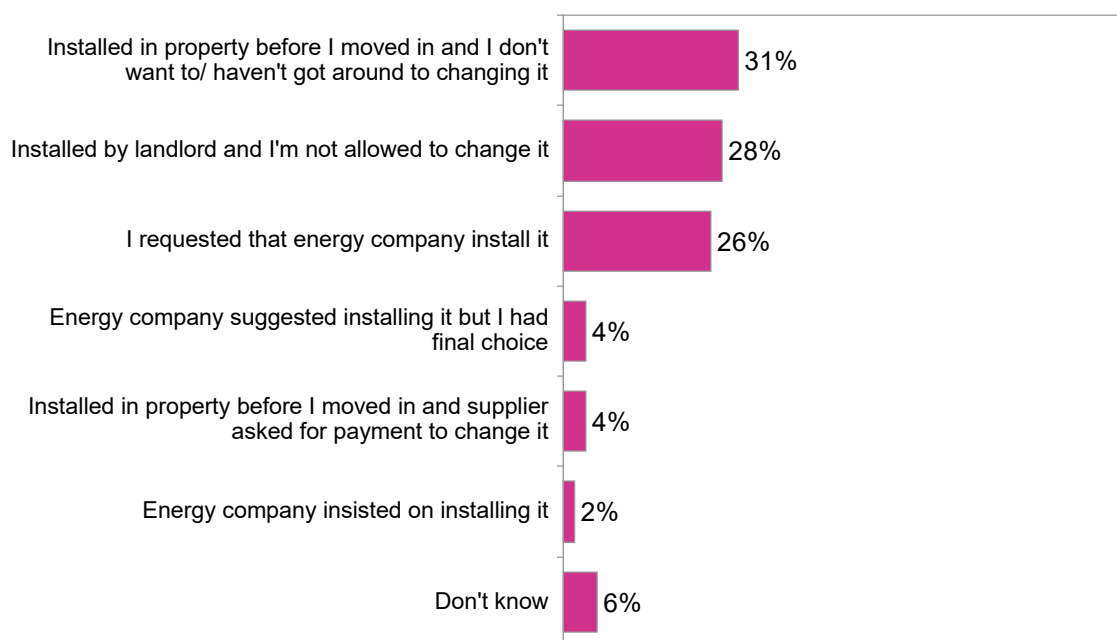
This was particularly the case for private tenants, over half of whom reported not being allowed to change or remove the meter, compared to around one-quarter of local authority and housing association tenants. A quarter (26 per cent) of PPMs had been installed at the consumer's request.

'We asked for a meter. My mum has a prepayment meter, that is how they manage and people have said it is a lot cheaper and more efficient. I am not sure it does, because we do seem to have put a lot of money into the gas meter. But we made the decision because it was cheaper and we wouldn't be stuck with a great big bill.' Male, 45-54, North of England

Only 2 per cent of PPM households reported that their supplier had force-fitted a PPM. While only a very few participants felt that their supplier had insisted they had the PPM installed it is worth noting that energy suppliers increasingly offer a PPM at a number of stages along the consumer debt path⁵. They may also strongly suggest (although not insist) that a PPM would be the best debt repayment method for their circumstances.'

⁵ 'debt path' refers to the process that energy suppliers will take indebted customers through in an effort to reach a payment settlement. Consumers may be offered a PPM at various stages of the debt path as a way to repay their debt and provide a secure payment method going forward. At the end of the debt path, where all other efforts to secure repayment have failed, suppliers may force fit a PPM as an alternative to disconnection

Figure 2: Origin of PPM installation



Base: All households with PPM aware of reason for installation (629)

Using a PPM to repay debt

Households had their PPM installed in order to repay a gas or electricity debt in 12 per cent of cases. Nearly 40 per cent of households with a PPM originally installed to recover a debt had since paid this off. PPMs were still being used to repay a debt by 7 per cent.

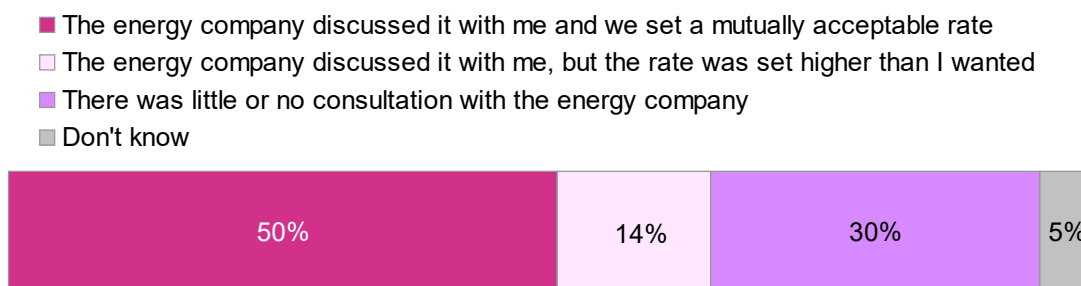
The amount owed in gas or electricity arrears by those who had had PPMs installed because of debts to energy suppliers varied, but was on average around £240.

Debt repayment rates

Half (50 per cent) of PPM households whose meters had been installed because of debt were satisfied that they had reached a mutually acceptable rate of repayment with their supplier at the time of installation. However, 30 per cent said there had been little or no consultation with the energy supplier about the repayment rate, and a further 14 per cent stated that the supplier had imposed upon them a rate that was higher than they were comfortable with. This is despite the fact that suppliers are required, when setting debt repayment levels, to establish the consumer's ability to repay⁶.

⁶ Standard License Condition 27.8 'the licensee must take all reasonable steps to ascertain the domestic customer's ability to pay and must take this into account when calculating instalments'

Figure 3: Way in which the repayment rate was set by the supplier



Base: All households with PPM installed to recover debt (87)

The qualitative interviews revealed that very few people had negotiated a lower rate of repayment with their supplier upon installation. The general pattern was for the rate to be dictated by the supplier and not contested by consumers.

'The gas wanted £20 a week. [My partner] is named on the meter and I phoned up and got it down to a tenner but they are damned ignorant. You can't heat your house.'

Male, 45-54, North of England

Most of those who continued to pay off a debt were paying £6 or less each week, with only a minority paying £11 or more. This was slightly less than the average GB debt repayment rate published by Ofgem⁷, which was around £8.50 per week. The current repayment rate was not known by 28 per cent of households.

Many of those still repaying agreed that they were paying an amount that was 'about right', although a third (32 per cent) claimed that the amount was too high. Although this latter group was small (17 people), it comprised a core of low-income households in receipt of means-tested benefits, many of whom were engaging in both self-rationing and self-disconnection and regularly using the emergency credit on their PPM.

In the qualitative interviews, the fact that having a PPM enabled consumers to pay off their energy debts emerged as a clear advantage. Frequently, issues and dissatisfactions with PPM use were counterbalanced or forgiven because having a meter gave consumers a strong sense of effective budgeting. One aspect of this was the obligation to pay off an energy debt.

'Every time I put something on my card I would pay it back so if I got £10 it would take £1 or £2 off... It was painless because you just kept putting it in the meter.' Female, 45-54, North of England

Consumers are often unsure or confused about their level of debt

Although the ability to repay debt on a PPM was generally seen by consumers as an advantage, the in-depth interviews revealed a complete lack of awareness of the exact level of debt that had been repaid to date. No interview participant recalled receiving a statement of their debt payments, although several were able to make rough calculations of the expected remaining balance by multiplying the approximate amount they paid in a month by the length of time the PPM had been installed. While all energy suppliers do provide, as a minimum annual statements, they are clearly not reaching or being utilised by a large number of PPM users.

⁷ Ofgem Social Monitoring Statistics, Q3, 2009

Somewhat alarmingly, three households (out of 31 interviewed) also reported being asked to pay debt that they either did not believe to be theirs, or simply did not understand how they had accumulated it.

In one extreme example a household was repaying a debt which they did not believe to be theirs. The residents, one of whom was disabled, had been on a PPM for many years but, after many unsuccessful attempts to challenge the debt, they gave in and agreed to pay it, albeit a significantly lower amount than was originally requested.

'Last year I said I was now going to change to another company but they wouldn't let me do it ... because they said this debt is on there. It was like £2,500 to start with. I argued the point and it is now £130. So we have just given up the argument and pay it. They are now saying that it was the previous supplier but I have been with them probably about 12 or 13 years. It is like somebody can knock on your door and say, "Okay, you owe us X amount of pounds. You have to pay it". We have no choice in it. They take it from the meter. They just told us what we would repay.'

Female, 45-54, South West England

Practical issues

Lack of knowledge about how PPMs work

The in-depth interviews revealed a marked lack of formal instruction or information from energy suppliers about how to manage or operate PPMs.

Most participants, including those who had themselves requested that a meter be installed, and even one whose meter had been force-fitted, claimed not to have seen written instructions telling them how to use their meter.

'I got about four or five different views [from the supplier] as to why it has disconnected and how much energy I am using. It is just so confusing. I just feel like I need an economics degree or something to work it out.'

Male, 25-34, South East England

Lack of knowledge about standing charges

Similarly, there was a notable lack of awareness about standing charges and, where householders were aware, of how much is deducted and when. Some qualitative participants knew that the meter took a small proportion of the credit they added when topping-up, but none knew exactly how much this was or when it was taken.

'I think the electric is so many pence a day. I am not sure how much it is. It is spread over the week so you are not supposed to feel it coming off. It will take maybe a pence or two pence a day. But the gas, for every £5 you put on, or every £10, they take between 30p and 60p.' Female, 25-34, North of England

This may reflect in part the fact that many people ‘inherit’ their meters: perhaps information booklets are not passed on. However, it also implies that at least some new customers did not receive information when registering with a supplier.

Poorly located meters

Meters can be poorly located in two main ways: either they are outside the property, and/or they are in an inappropriate location, for example very high up, which makes it hard for the household to access them.

Many participants in the in-depth interviews had at least one of their PPMs located outside. An outside meter offers practical problems and inconvenience, particularly when it is dark or raining. It also means that the householders must make a conscious decision to check the level of credit remaining on the meter, and will not hear any warning beep when emergency credit is activated.

Even when a meter is located indoors, its physical position can be inconvenient or impractical for householders, for example in an under-stairs cupboard, although this affected only a minority it was particularly difficult for those with mobility problems.

Technical problems with the meter

Although technical problems with the meter that prevented topping-up were a relatively rare event, the in-depth interviews revealed that when technical problems and meter breakdown do occur, they can cause major problems and are a significant source of stress and distress to householders.

One consumer interviewed for the qualitative research had a fault with her PPM which meant that when she tried to add credit to top it up, the credit disappeared. She contacted the supplier, only to be told she would need to wait five to six days while they ordered a part for her meter. The family spent a week without central heating or hot water. This is despite the fact under the Guaranteed Standards of Service suppliers are obliged to respond to calls to repair faulty PPMs within a certain time limit.⁸

‘There was money on the card. I put it in and it all went off. Different engineers say different things. “I have got to order a part. You are going to have to wait for five to six days”. I can’t wait for five to six days, I have got a baby! “There is nothing we can do”. So we had a week with nothing.’

Female, 25-34, North England

Topping-up the meter

Six in 10 PPM households usually topped-up their meter at regular intervals (eg every single week). A small percentage (3 per cent) normally waited until the supply was disconnected before topping-up. Two-thirds of PPM households topped-up their meter at least once in a typical week.

Those with the most constrained budgets were more likely to top-up at least once a week than those with relatively higher incomes. For example, those on means tested benefits were significantly more likely to top-up at least weekly (71 per cent) than those who were not (58 per cent).

⁸ GGS2 and EGS7 – Suppliers must arrange a visit to fix a gas or electricity PPM in four hours if called between 8am and 8pm Monday to Friday, or 9am and 5pm at weekends and bank holidays.

This was supported by the qualitative research, which found that many PPM households on low incomes did not wish to ‘tie-up’ too much of their weekly budget and valued the flexibility that came with being able to make small top-ups when needed, but still have cash available for other demands.

‘I remember when I lived in another house on my own and I couldn’t believe the bills, because you don’t realise what you are doing, but this way I put £3 in the meter and I will put it on an hour today and maybe an hour tomorrow. You can judge it more.’

Female, 25-34, Wales

Over three-quarters (78 per cent) topped-up their key or card at a Paypoint or Payzone⁹. Through the in-depth interviews it became apparent that for the majority, even in rural or suburban areas with limited facilities, topping-up during the day was not a problem. That said, many found it frustrating that they were required to pay cash for meter credit: this can mean an extra trip to the nearest cash point as well as to the top-up point. If a cash point in a local store is then used to withdraw money, this can sometimes result in an additional charge as many cash points in convenience stores can charge up to £2.00 to use the machine¹⁰. The practicalities of topping-up are, however, more of a problem in three specific cases:

- at night
- if one or more of those responsible for the meter has a health condition which severely limits mobility
- and if the meter is poorly located



⁹ There are three main bill payment networks where consumers can buy credit for their PPMs; PayZone, PayPoint and the Post Office Paystation network. These are infrastructure platforms, which are based in a range of premises, including local shops, garages and newsagents (note the Post Office Paystation network is currently only available in the Post Office). Premises typically offer at least one of these terminals, depending on their contract.

¹⁰ Although it is possible to pay by credit or debit card at some Payzone outlets it is clear from our research that there remain a number of outlets across Great British where this is not possible.

Where the household is dependent on someone else to be able to top-up, those people are less likely to be available late at night or early in the morning. If credit runs out at these times, there is little that the household residents can do but wait until someone is available to go the shop for them. Although the majority of the 'Big Six' offer a no-disconnect policy at night-time, this is only available for electricity PPMs, and depends on the model of the meter. For more information on this see Annex 2.

'I have had times when it could be the middle of the night and it is freezing, or in the morning for a shower and it has just gone. It has gone in the night so I don't even know it has gone, and I wake up and it has gone and it is too late to run to the shop and get the top-up. So I have to go without a shower for work. That is when I really hate it.'

Male, 25-34, South East England

Better technology could address topping-up frustrations

While the majority of PPM users are satisfied with this payment method, in the in-depth interviews participants expressed frustration that they did not have more choice in the way they topped-up. The lack of innovation in this sector was contrasted unfavourably with prepay mobile phones, where consumers have a range of possible ways to top-up credit, such as online, by text message or at a cash point.

It is worth noting that a step in the right direction has already been taken by some suppliers who offer an online top-up facility using a debit or credit card.¹¹ Looking further into the future, we understand that some suppliers are trialling or looking to develop systems using smart technology which give consumers a greater choice of ways to top-up (See Annex 4).

It is interesting to note that three-quarters of PPM households (73 per cent) had a laptop or personal computer at home, and 93 per cent of PPM households had some form of internet access either at home or at work.¹² This is not significantly different to non-PPM households, where 78 per cent have a personal computer or laptop, and 97 per cent have access to the internet at home or at work. Of PPM households, more than forty per cent (43 per cent) checked their bank balance online, and 86 per cent used email. These figures confirm that a large share of the PPM market would potentially benefit from a wider range of options for topping-up.

¹¹ See Consumer Focus On the margins June 2010 for more on the issues around being excluded from mainstream financial services.

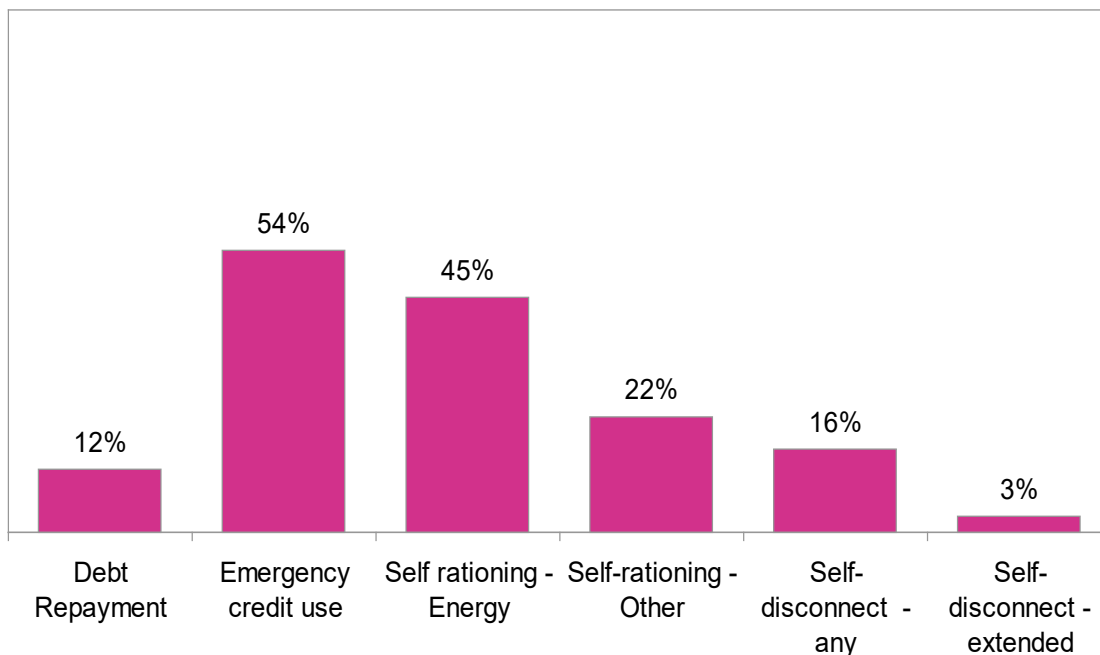
¹² See Consumer Focus Broadband minded? for more on the issues around digital exclusion.

Section 2: Emergency credit use, self-rationing

The research identified a clear, sliding scale of different consumer behaviours to limit money spent on topping-up the meter, or to make existing credit last longer. These were emergency credit use, self-rationing, and at the more extreme end of the scale, self-disconnection. The following section of the report looks at the reasons why consumers use the emergency credit, self-ration and self-disconnect, the extent of this behaviour among PPM households as a whole, and the effect these behaviours have on the household.

Figure 4 below illustrates the incidence of emergency credit use, self-rationing, and self-disconnection, and the way these break down within the PPM landscape. Emergency credit use and self-rationing are explored in more depth in this section; section 3 focuses on self-disconnection.

Figure 4: Incidence of key types of behaviour among GB households



Base: All respondents with PPM (718)

Emergency credit

What is emergency credit?

Emergency Credit is a limited amount of extra credit on a meter (typically around £5) which allows customers to stay connected to the supply even though they have technically run out of credit and need to top-up. The value of any emergency credit used is deducted from the next top-up.

More than half of PPM households had used emergency credit in the last year

Those living in rented accommodation (be it private rental or social/local authority housing), those receiving benefits and those whose meter was installed to collect debt repayments were more likely to have used the emergency credit facility.

Households that use the emergency credit were also more likely to have self-rationed their energy use or spend (66 per cent) than those who did not use emergency credit (47 per cent). Self-rationing behaviours are explored in more detail in the following section.

Use of the emergency credit facility was also higher where one or more household residents had a chronic health condition (65 per cent) and where children were present in the home (62 per cent).

Emergency credit was used by some consumers as a buffer zone, to bridge the gap between credit running out and having money available. For others, the warning beep or the need to activate the emergency credit was a trigger to top-up. It was also used when consumers didn't have time to go to the shop and by those consumers who were simply disorganised or forgetful.

'Maybe I should have gone to the shop to get some, but I just put the emergency on until the emergency goes and then I have got to do something about it.'

Male, 35-44, Wales

There were some differences in the use of emergency credit by in the different nations. PPM households in Wales were significantly more likely to have used emergency credit (79 per cent) than those in Scotland (55 per cent) or England (52 per cent).

All those interviewed in the qualitative research knew exactly how much emergency credit was available to them on their meters. The general perception was that the more credit available, the better this was. Finally, several participants commented that gas meters do not make a warning 'beep' and this was raised as a frustration.

Self-rationing

What is self-rationing?

Self-rationing is defined as a behaviour whereby the PPM household makes choices in order to either save money in other areas specifically to top-up their meter or to reduce their energy consumption. This behaviour often goes well beyond basic energy efficiency measures and often involves cutting back on everyday essentials and/or energy use in a way that impacts negatively on the consumers' daily life. This can range from not socialising, having to go to bed early just to keep warm or skipping meals.

Half of PPM households had self-rationed energy or expenditure in the last year

During the previous 12 months, half of PPM households had taken one or more steps to preserve credit on their meter, or to cut back expenditure on other areas to save money for buying credit.

What drives consumers to self-ration?

Overall, PPM users lacked financial control and, to some extent, autonomy. As seen previously, a relatively high proportion of PPM households did not work and were dependent on benefits. They were not, therefore, in a position where they could work harder or longer, for example through overtime, to earn more money. This left them in a position of having to make ongoing trade-offs. Even PPM users who were working, were likely to earn lower incomes. Consequently, PPM households were repeatedly forced into a position of having to choose between spending on energy and spending on other necessities, including food and leisure.

There were some differences in the level of self-rationing between the GB nations

- The lowest national rate was in Scotland, where one-third of PPM households (32 per cent) had self-rationed in the previous year
- Half (50 per cent) of PPM households in Wales had self-rationed
- The highest national rate was in England, where more than half (53 per cent) of PPM households had rationed energy or spend in the past year. The highest rate of self-rationing in England was found in the South West region, where 70 per cent of PPM households self-rationed. This figure was significantly higher than many other regions of England

Extreme self-rationing

The in-depth interviews showed that within the group that are self-rationing, as with self-disconnection, there are different typologies. Some consumers take what are generally considered to be reasonable precautions to reduce their energy use, for example by turning off lights when they leave a room, or not leaving appliances on standby. However some consumers interviewed were going to extreme lengths to eke out their money for as long as possible. While these people were usually avoiding actual self-disconnection, the actions they took to make their credit last as long as possible, such as regular use of the emergency credit and extensive self-rationing, were clearly having a negative impact on their overall quality of life.

‘On microwave meals I look out for bargains and I have even bought out of date things as well. I have had to, because there is no choice sometimes. Sometimes I am not able to wash my clothes because I can't afford the washing liquid to do it, which is not right because I do like to have clean clothes to wear and clean bedding. I cut back on a lot of things. I won't Hoover sometimes because it will take power and I am convinced I am using more with that meter.’

Female, 45-54, Wales

One consumer whose daughter suffers from multiple sclerosis explained the lengths she went to in order to ensure that the heating stays on:

‘I will skip bills or whatever I have got to skip to make sure our rent is paid, and the gas and electric are my main priority.’

Female, 45-54, Wales

Self-rationing of energy

Almost half had rationed energy

Nearly half of PPM households had rationed their energy use, and this was typically something that was done on an ongoing basis. Those renting their homes had a higher-than-average incidence of energy rationing. Those with a long-term health conditions or disabilities were also significantly more likely to have rationed their energy use than those who did not have a health condition, with 50 per cent of the former group having done so. The in-depth interviews suggested that this is because, for these groups, staying connected to the energy supply is a much higher priority, and often takes precedence over other expenditure.

As would be expected from their generally lower level of income, PPM households in receipt of means-tested benefits were significantly more likely (57 per cent) to be rationing energy or expenditure.

PPM households with a meter installed because of debt were also significantly more likely to engage in energy self-rationing (63 per cent) than those whose PPM was installed for other reasons (49 per cent self-rationing). This suggests that while some PPM users managed their energy without having to make conscious, specific financial sacrifices, others were struggling, having fallen into debt and now restricting their energy use or expenditure in order to try and 'make ends meet.'

'I won't keep all the lights on. I will have one light on and the TV and things like that. I know that I have to be aware. If I keep all the electrical appliances on it will probably last around four days instead [of six]... If my electricity is running low I will turn the fridge off because the fridge takes up most of the electricity in the house.'

Female, 25-34, South East England

How do consumers self-ration energy?

The principal way in which PPM users reported self-rationing energy was by turning down their central heating; this applied to one-third of all PPM households. Others reported consciously switching off TVs, computers or games consoles, or cutting back on hot water usage. One qualitative participant reported switching off appliances like her iron even if she was leaving the room briefly; another explained that she had started to buy packets of rice to cook in the microwave, rather than boiling it in water on her gas hob.

The in-depth interviews however revealed some fundamental gaps in understanding of which appliances use most energy. One participant was habitually turning off her refrigerator because she thought it was using the bulk of the electricity; another had bought a gas kettle because it used less energy than his old electric kettle, but was about to reject the local council's offer to replace his old electric storage heaters with gas central heating.

Impact of self-rationing energy

The over-riding and most obvious impact of rationing energy was that it made households colder than PPM users would have liked and both created and exacerbated physical and mental health problems.

Energy rationing also had dietary consequences. Eating a diet of microwaved and cheap convenience food (for example, instant noodles) and even skipping meals indicates that PPM users are sometimes forced in to making less healthy food choices.

There are, additionally, impacts on PPM user's social lives. A participant, who was separated from his children's mother, explained that having to go without heat in his flat meant that his children could not visit him at home in the winter.

'I couldn't afford to bring the kids here because of the cost of the heating. The kids have actually been in this house once since I have moved in here. I haven't been to them, because with the money I am getting at the moment I just can't afford to do it, to heat the house and things like that or the things that I need to buy. I can't bring the kids here to stay.' Male, 35-44, Scotland

Self-rationing of household expenditure

One in five had cut back on food and leisure

One-fifth of PPM households had cut back the amount of money they spent on food or leisure in the past year, specifically in order to buy meter credit.

One quarter (25 per cent) of households where someone had a health condition or disability had rationed their food and leisure spend. This was a significantly higher proportion than among households where residents did not have any health conditions or disabilities (17 per cent).

With regard to food rationing, in less extreme instances many participants reported that in order to save money they always bought the cheapest food ranges. At the more extreme end of the scale, participants in the qualitative interviews described skipping meals and having hot drinks instead, in order to save money to buy credit for their PPM.

One in 10 had rationed expenditure on other bills

One-tenth of PPM households had reduced their spending on other bills. This included 6 per cent of PPM households (more than 40 people) who had actually missed paying another bill, such as council tax, in order to make more money available to buy credit for the meter.

How do consumers self-ration expenditure?

Socialising and food were the two main areas that PPM users rationed. Many qualitative participants had given up or cut back on their social lives at some time, as their financial circumstances tightened. They spoke of not having been on holiday, or to the pub, in months or years. With a lack of money available for social activities, it is not surprising that for many, their leisure time revolved around the television set. Socialising outside the home and even spending time with others was rare.

Impact of self-rationing household expenditure

Extreme food rationing meant that one consumer lied regularly to her partner about having eaten during the day; such was her embarrassment at not having enough money to buy credit.

'[My partner] doesn't know. He is at work. He will come in and say, "What have you had to eat?" and I am like, "I had soup". I tell lies.'

Female, 25-34, Scotland

Participants with a supportive family would sometimes go and eat with relatives. Many described the ongoing worry of having to budget continually. For some, who had been on a low income for most, if not all of their lives, the need to budget was not a direct consequence of PPM use and was so ingrained that it was not easily expressed. Many participants were pragmatic and/or stoical and expressed the view that ongoing financial struggles and providing enough credit were something they must just 'get on with.'

For several, money was so tight that spend on either food, leisure or other bills had been low to begin with, and economising made little noticeable impact. Feeling fed up, ashamed or depressed that money was so limited only added to existing feelings of depression about their current financial situation and that they were trapped in an ongoing struggle to make a low income provide basic energy and food.

On the face of it, having to miss a dance lesson or a weekly trip to the pub to play darts may not seem likely to cause any detriment to consumers. Yet often it is not a case of consumers 'cutting down', but cutting out their only social activity for the week. Stopping these activities can contribute to low level social isolation, with subsequent impacts on mental health.

What is self-disconnection?

Self-disconnection occurs when a meter is not topped-up (either accidentally or intentionally) before all the credit, including emergency credit, is used and the supply is cut off.

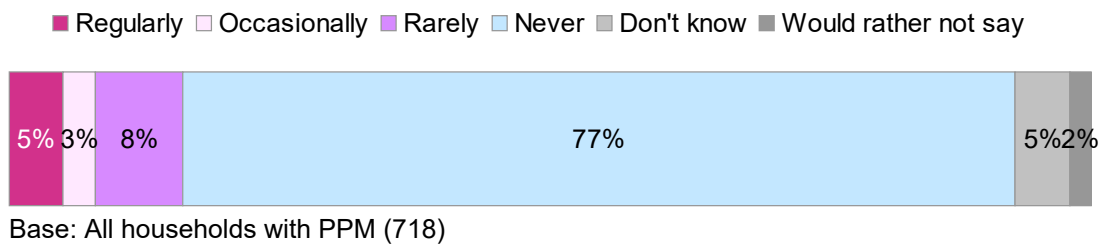
A minority of PPM users had self-disconnected in the last year

16 per cent of all PPM households had self-disconnected at least once 'in the last year' (February 2009 – February 2010).

The frequency of self-disconnection varied substantially, with 5 per cent self-disconnecting 'regularly' (at least three times a month), 3 per cent 'occasionally' (six to 12 times in the last year) and 8 per cent only 'rarely' (one to two times in the last year). Those households whose main heating source was electricity were more likely to have self-disconnected (26 per cent) than those who had gas-fired heating (14 per cent).

Section 3: Self-disconnection

Figure 5: Frequency of self-disconnection during the 'last year'



Who self-disconnects?

Households that had self-disconnected were significantly less likely to own their home (19 per cent) than to rent one either privately (35 per cent) or from the local authority or a housing association (46 per cent).

These households were also more likely to have an income of less than £13,500 (51 per cent) than those not self-disconnecting (35 per cent). Three-quarters (74 per cent) of self-disconnecting households received one or more state benefit as part of the household income. PPM households falling into the self-disconnecting group were significantly more likely to be receiving means-tested or disability benefits (62 per cent) than those not self-disconnecting (50 per cent).

Self-disconnecting households were more likely to have residents with an illness or disability (44 per cent). It is also worth noting that those with mental health conditions, such as depression, were slightly (although not statistically significantly) more likely to have self-disconnected (26 per cent) than those who have no health conditions (14 per cent). The relationship between mental health and self-disconnection is explored in more detail later.

Unsurprisingly, those who had self-disconnected were more likely to have engaged in self-rationing (78 per cent) than those who had not (50 per cent). A similar picture emerges for emergency credit usage (92 per cent of those self-disconnecting, compared with 51 per cent of those which had not). This reflects the financial pressures that lead to this type of behaviour.



Figure 6: Self-disconnection by PPM household type

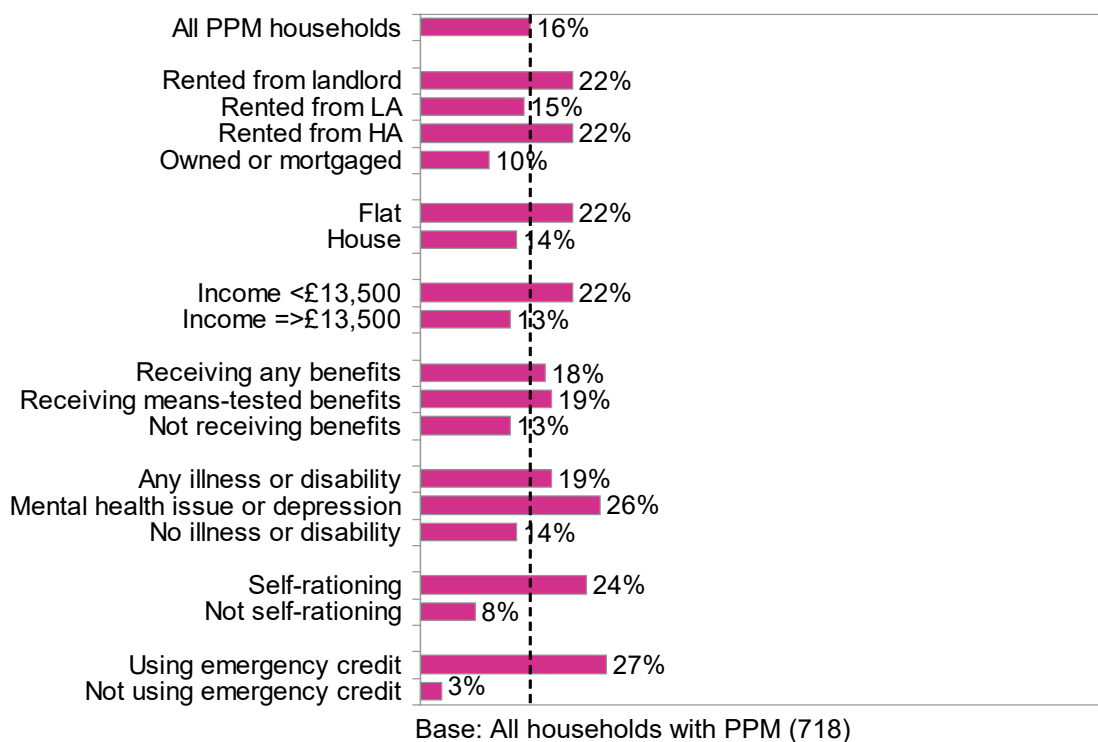


Figure 6 illustrates the proportion of households in each of these circumstances that had self-disconnected in the last year, and allows comparison between the incidences of self-disconnecting within various types of household.

There are differences in the levels of self-disconnection between the GB nations

There are also some differences between the three GB nations in terms of the overall incidence of self-disconnection:

- 18 per cent had self-disconnected in England. Incidence rates in the East Midlands and the South East (excluding London) were particularly high (30 per cent and 23 per cent respectively)
- 9 per cent had self-disconnected in Scotland
- 7 per cent had self-disconnected in Wales

Consumers self-disconnected more over the winter

Households that had self-disconnected were less likely to top-up their meter on a regular basis (eg weekly). Almost half of all self-disconnecting households reported that there were seasonal variations in the frequency of their self-disconnection. Of these, practically all (99 per cent) reported that self-disconnections occurred more frequently during the winter months (December, January and February). This is during the period covered by the 'Winter Moratorium', where energy suppliers are prevented from disconnecting households with credit meters for unpaid charges, with occupants who are exclusively over 60 or under 18. They are also strongly discouraged from disconnecting any vulnerable consumers during this period¹³. The main reasons for increased self-disconnections during the winter months were having the heating on more and a general increase in other energy consumption.

Consumers often self-disconnected more at certain times of the day, week or month

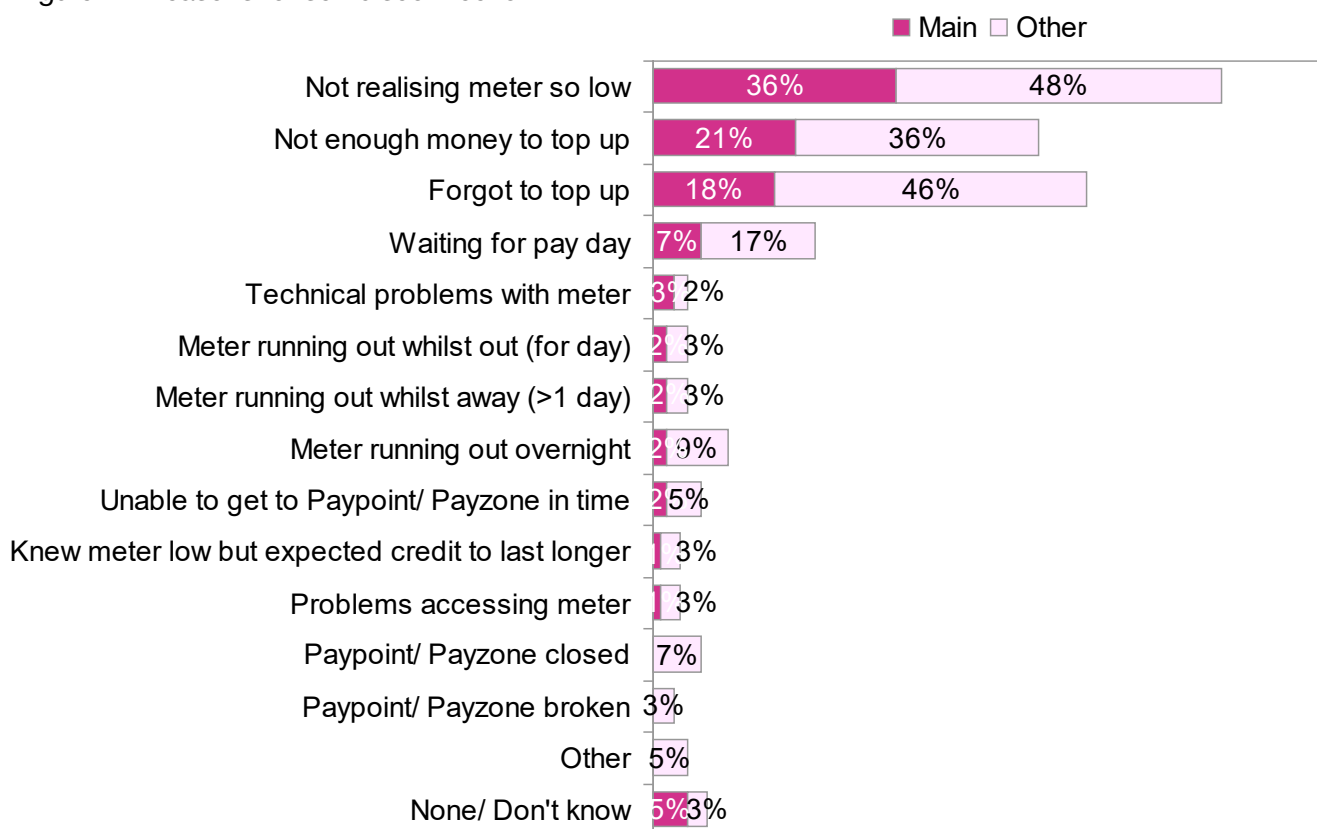
Almost one-third of self-disconnecting households tended to self-disconnect more at certain times of the month, week or day. The most common experience is of weekly patterns of self-disconnection, primarily related to the fact that many of these households are in receipt of benefits or wages that are paid on a weekly basis. 'Waiting to be paid' was also the most common reason for self-disconnection on a monthly basis. More frequent self-disconnections at certain times of the day are mainly linked to credit running out 'overnight.'

Reasons for self-disconnection

There were three 'main' reasons that meant households failed to top-up before being disconnected from their supply: not realising the meter was low on credit; insufficient money available at the time; and simply forgetting to top-up.

¹³ SLC 27.10 and 27.11: disconnection for unpaid charges. 'The licensee must not Disconnect, in Winter, a Domestic Premises at which the Domestic Customer has not paid Charges for the Supply of Electricity if it knows or has reason to believe that the customer is of Pensionable Age and lives alone or lives only with persons who are of Pensionable Age or under the age of 18.' And 'The licensee must take all reasonable steps to avoid disconnecting, in winter, a Domestic Premises at which the Domestic Customer has not paid Charges for the Supply of Electricity if the occupants of the premises include a person who is of Pensionable Age, disabled or chronically sick' and to whom paragraph 27.10 does not apply.

Figure 7: Reasons for self-disconnection



Base: All self-disconnecting (115)

When all factors are taken into consideration, the three 'main' reasons remained the dominant causes of disconnection. Some other factors reveal more detail about those factors – 'waiting for pay-day' explains why sufficient money was not available and running out overnight or while out/ away demonstrates either a lack of awareness of the credit level, or having forgotten to top-up during the day. Technical meter problems and practical problems such as getting to a top-up point or (limited) shop opening hours were a factor for only a small minority.

How long do self-disconnections typically last?

Not all consumers who self-disconnect follow the same pattern. Two out of three disconnecting PPM households were disconnected for fewer than three hours in a typical self-disconnection. Only a very small proportion had experienced extended self-disconnection.

Just over one-third (37 per cent) of households were usually disconnected for less than an hour, while another quarter (27 per cent) were disconnected for between one and three hours. 9 per cent were typically disconnected for more than 24 hours, but only one per cent was typically self-disconnected for two days or more at a time.

The most financially constrained households are self-disconnecting for the longest

Although not statistically significant due to the small sample sizes in some categories, there are clear indicators that those households which are most financially constrained are the households disconnecting for the longest periods of time:

- Almost all of those self-disconnecting for 12 hours or more had an annual household income of less than £13,500
- Almost all of those self-disconnecting for over 24 hours received state benefits
- Almost all of those self-disconnecting for over seven hours lived in rented accommodation

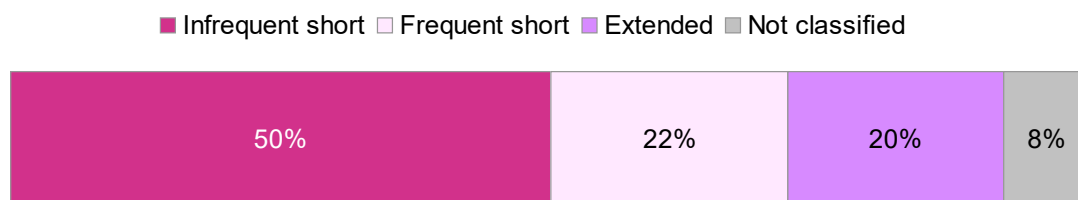
Table 2: Typologies of self-disconnecting households

| Typology | Summary | Duration and frequency |
|------------------------|---|--|
| Frequent, short-term | Households that self-disconnect frequently for a relatively short period of time | Typically disconnect for less than 7 hours, at least 2-3 times per month |
| Infrequent, short-term | Households that self-disconnect for a relatively short period of time, and also relatively infrequently | Typically disconnect for less than 7 hours, once a month or less |
| Extended | Households that disconnect for more extended periods of time, regardless of frequency | Typically disconnect for more than 7 hours |

(Base: 115 self-disconnecting PPM households)

The graph below shows the frequency of self-disconnection for the different typologies:

Figure 8: Breakdown of self-disconnecting household typologies



Base: All self-disconnecting (115)

Different types of self-disconnections

'Short-term' self-disconnection

While over half of those in these categories typically self-disconnected for less than one hour, the period of up to seven hours accounts for those who found that their supply was cut-off during the day while they were out, or at some point during the night.

Snapshot: Frequent, short-term self-disconnection

Jim, his partner and their six-year-old child live in suburban area of South West England. They have PPMs for both gas and electricity and self-disconnect from both on an almost weekly basis, primarily due to disorganisation. The disconnections usually occur while they are out at work but they always top-up as soon as the disconnection is discovered.

Many of those in the 'frequent, short-term category' self-disconnected purely as a consequence of disorganisation or absentmindedness. However, they typically had sufficient financial resources to top-up immediately, once a disconnection occurred.

The 'infrequent, short-term' category includes those who self-disconnected only rarely and for short-periods because they were experts in managing their budget, and self-rationed extensively in other areas of their life to ensure that the power supply remained available. Others in this category are those who were less financially constrained and topped-up regularly, but occasionally self-disconnected for a variety of reasons such as a disorganised life style or events such as parties that used more energy than predicted.

Snapshot: Infrequent, short-term self-disconnection

Jasmine lives on her own and works full-time for an insurance company. She tops up her meter on a monthly basis when she is paid and regularly checks the remaining credit. She self-disconnects only very occasionally, by accident, often when she has used more gas than usual – for example, when friends have visited so the heating has been on for longer and she has been cooking more.

While both the qualitative and quantitative data suggest that households in both of the 'short-term' categories were the least likely to experience some of the more 'serious' impacts of self-disconnection (ie extended periods of time without heat or lighting), it would be wrong to regard this category as not experiencing any significant negative impacts as a result of their energy situation.

'Extended' self-disconnection

This category essentially represents households who are experiencing extended periods of interruption to their energy supply. This category is far from homogenous and contains, among others, those who are disconnected for longer periods of time due to technical problems with their meter, those who are reliant on 'other people' who may not always be available, to top-up their meter and those who deliberately disconnect for an extended period.

Snapshot: 'Extended' self-disconnection

Gwenna works three days a week in a supermarket, earning £76. Last year, her income tailed off and she ran up a debt of £254 for her gas and consequently accepted a PPM to repay her debt. She negotiated a repayment rate of £5 per week. Four or five times over the winter, she had run out of gas by Wednesday, and her financial situation meant her having to wait until being paid on Friday to top-up the gas meter. On these occasions she went for two days without heating. Her usual coping strategy was to go to bed early with a hot water bottle and watch TV. She describes the impact of self-disconnection as 'miserable.'

Clearly, extended periods of disconnection will have significant impacts, particularly in the case of electricity which leaves people without access to light, most domestic appliances and, frequently, hot water and heating. This category essentially represents the households who are experiencing the greatest interruption to their supply, and as a consequence, a particularly vulnerable group of consumers in need of help and support.

Vulnerable consumers that should not have a PPM in the first place

- The category of 'extended self-disconnecting' PPM households encompassed 27 households in this research. It is worth noting that of these 27 households, at least half (14) contained residents who could be classified as 'vulnerable' by the energy industries 'Safety net' aimed at protecting vulnerable consumers from disconnection.¹⁴ At least two households had residents aged over 60.
- Nine households were home to children under the age of 16
- Five households were in receipt of Disability Living Allowance (two with children)

If these consumers had contacted Consumer Focus' Extra Help Unit, they would have been offered help and their supplier informed of the situation. In addition, 13 households had at least one resident with a long-term health condition (five of whom are already included in the above group of 'vulnerable' households identified above.) As discussed previously, if these consumers had a credit meter, they would have been entitled to extra protection against disconnection for unpaid charges under the 'Winter Moratorium'; furthermore their disconnection would have constituted a breach of the Winter Moratorium¹⁵. Yet these vulnerable consumers are being left to self-disconnect because they lack the means to keep their meter topped-up. Suppliers are also not aware of their customers' vulnerability and the fact they are self disconnecting.

¹⁴ <http://bit.ly/cg4e8l> (PDF) The Energy Retail Association Safetynet is an agreement by the 'Big Six' suppliers not to knowingly disconnect any consumer who for reasons of age, health, disability or severe financial insecurity, are unable to safeguard their personal welfare or the personal welfare of other members of the household.

¹⁵ SLC 27.10 and 27.11: Disconnection for unpaid charges 'The licensee must not Disconnect, in winter, a Domestic Premises at which the Domestic Customer has not paid Charges for the Supply of Electricity if it knows or has reason to believe that the customer is of Pensionable Age and lives alone or lives only with persons who are of Pensionable Age or under the age of 18.' And 'The licensee must take all reasonable steps to avoid Disconnecting, in winter, a Domestic Premises at which the Domestic Customer has not paid Charges for the Supply of Electricity if the occupants of the premises include a person who is of Pensionable Age, disabled or chronically sick' and to whom paragraph 27.10 does not apply.

A small proportion of consumers intentionally self-disconnect

Of those PPM households who had self-disconnected in the last year, 6 per cent reported that they had chosen not to top-up their meter, even though they knew that this would mean disconnection from the supply.

Intentional self-disconnections are, as would be expected, almost entirely driven by financial considerations. The qualitative research suggests that the majority of households in this category are those who cannot afford to top-up at the point where the credit runs out, and must wait until they can borrow money or are paid/receive their benefits a day or so later. It does, however, also include those who choose to disconnect for a much longer period of time because they do not need that type of fuel. Examples of this include self-disconnecting from the gas supply over the summer as no heating is required, or going to stay with friends or relatives for a few weeks in order to save money.

At the time of the in-depth interviews, one consumer had been disconnected from his gas supply for three weeks.

'I couldn't afford to heat the place. I was staying with my mum quite a lot.'

Male, 35-44, Scotland

There are a variety of other behaviours and circumstances which also lead to unintentional self-disconnection. These include:

- Knowing the meter was low but being unable to top it up in time, for example due to health or mobility problems
- Knowing the meter was low but expecting the credit to last longer (either a miscalculation or an unexpected event)
- Never checking the meter and effectively using disconnection as a trigger or reminder to top-up

Where financial constraint was the main driver, it was often indicative of more extreme self-disconnecting behaviour

When looking at those households whose main reason for self-disconnection was either having 'insufficient money to top-up the meter' or 'waiting for pay-day', there is a clear difference in terms of their profile, compared with those self-disconnecting for other reasons, such as being disorganised. Financial pressures are evident in other areas of life and result in more extended self-disconnections. For example, out of the 115 consumers that were self-disconnecting for financial reasons, almost half (47 per cent) had a daily, weekly or monthly pattern to self-disconnections, and almost half (49 per cent) fell into the 'extended' self-disconnection category. In contrast, out of the consumers that were self-disconnecting for other reasons, such as disorganisation, only 8 per cent came under the 'extended' self-disconnection category.

It is important to note that self-disconnection for financial reasons is not restricted to consumers who are living on benefits. The in-depth interviews alone showed a number of cases where consumers could be considered as ‘working poor’; they were working full time, and yet found it an ongoing struggle to keep their meter topped-up.

‘I think it is a bit cruel actually for people more unfortunate than others ... I have got a job but other people haven't got jobs and they are struggling. I am still struggling and I am working.’

Female, 45-54, North of England

Problems topping-up that lead to self-disconnection

The impact of mobility problems is relatively obvious – it can be difficult for a customer to reach a top-up point if they can only walk a short distance and cannot drive. It is also important to note that these problems do not only affect those with long-term health conditions: an accident can render an otherwise able-bodied individual unable to follow their normal routine for an extended period. Likewise, parents with a new baby can suddenly find the whole process of topping-up a lot more difficult than it was before.

‘I find it quite hard because I have got a baby as well and if you run out during the day.... When it was snowing [with] the pram it would take about an hour and a half [to walk two miles].’

Female, 25-34, North of England

Problems with topping-up the meter are not limited to those with mobility issues. The quantitative data revealed that those with mental health conditions are more likely to have self-disconnected over the last year. The in-depth interviews seemed to confirm this link, with several participants indicating that they suffer from depression or ‘feeling low’ and this manifests itself in feelings of being ‘unable to cope’ or, in more extreme situations, of feeling unable to leave the house.

‘I do have breakdowns. I cry my eyes out nearly every day. I am on depression tablets because of money and debts... I can't even buy a magazine at the shop because I have got no money. It gets me down. It seems so wrong when they take all that money off you every single time.’

Female, 25-34, Wales

‘If I'm feeling really ill and weepy like I do, I don't go through the door ... It is quite frightening.’

Female, 45-54, Wales

Strategies for dealing with self-disconnections

When asked which of a series of measures had been taken as a direct result of a self-disconnection, over half of all households reported having taken at least one step, representing what could be considered to have a significant impact on their lifestyle.

The most common action, taken by one-third of households, was to borrow money from family or friends, allowing them to top-up more quickly. One-fifth had cancelled leisure activities in order to have money for the meter, and 16 per cent had resorted to going back to bed or using hot water bottles or blankets to keep warm during the day.

Self-disconnection has clear negative impacts

Almost half of PPM households that had self-disconnected said that the disconnections had had a negative impact on their wellbeing. These results are confirmed and enriched by the findings from the in-depth interviews.

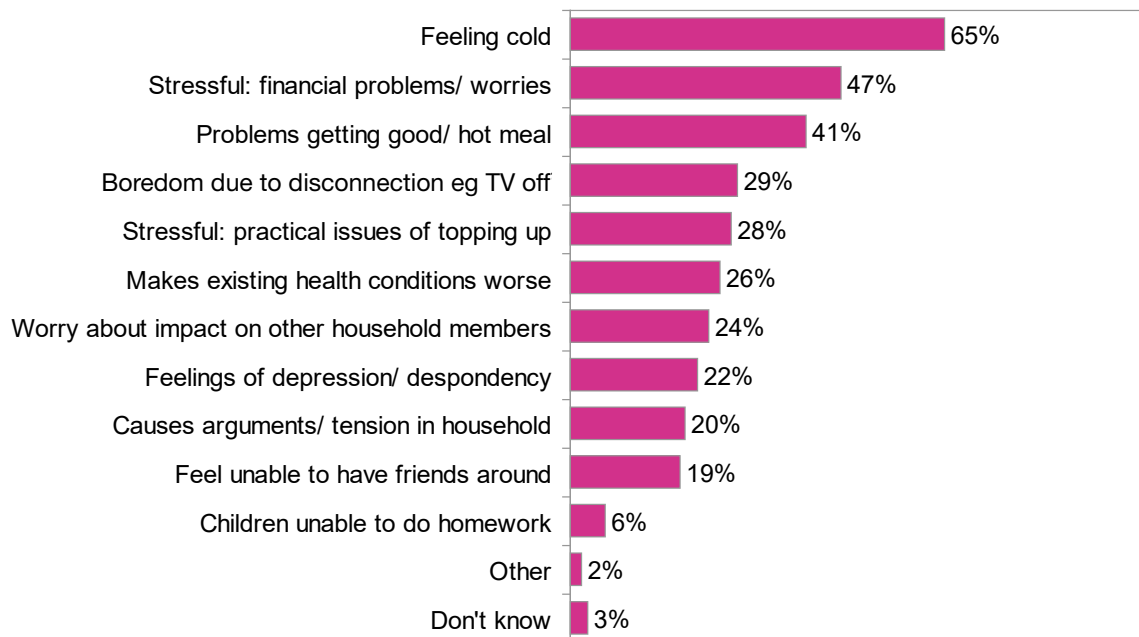
The major physical and practical impacts of disconnection were:

- Lack of heating and warmth
- Impaired quality and nutritional value of food
- Negative effects on leisure and lifestyle
- Impacts on finances

The main emotional and psychological impacts of disconnection were:

- Financial stress and worry
- Stress about the practical issues of having to top-up

Figure 9: Negative impacts on wellbeing as a consequence of self-disconnection



Physical and practical impacts

Heating and warmth

The physical impacts were those that came to mind most easily, particularly feeling the cold (65 per cent), but also the exacerbation of existing health conditions (26 per cent). The exacerbation of existing health conditions is in itself often associated with having cold or damp living conditions, particularly for people living with respiratory or circulatory conditions, for example.

'I have got to keep warm because I have got Raynaud's Disease. It is like blood circulation so if I get cold, I get, like, majorly cold, so I have always got to be warm... My feet have gone purple today.'

Female, 25-34, Wales

Food and nutrition

The effect of self-disconnection on consumers being able to prepare a hot, nutritious meal should not be underestimated (it affected 41 per cent of consumers who self-disconnected). The qualitative research revealed families who regularly substituted home-cooked meals for microwave meals when their gas supply was disconnected, and a mother who skipped meals in order to ensure that she could keep her flat connected to the electricity supply and feed her child. If sustained, these strategies for 'coping' would almost certainly be detrimental to the health of those who engage in this behaviour, as they are unlikely to be eating a balanced and healthy diet.

'I don't cook very often. I go up to my mum's for food instead. I can't afford food. You go to the shop and healthy food is £5. Rubbish food is £1 for a pasty, so you get the pasty, don't you?'

Female, 25-34, Wales

At the more extreme end of the scale, albeit in a relatively small number of cases, some households had been unable to cook at all and purchased takeaway food instead. Some had also ultimately had to replace the contents of their fridge and/or freezer due to the length of the period of disconnection.

Leisure and lifestyle

As would be expected, self-disconnections have an impact on leisure and lifestyle, particularly when the disconnection lasts for an extended period of time. The main way in which this manifests itself is in households needing to cancel planned social activities or not being able to go away on holiday. Even for shorter periods there are impacts on lifestyle: these range from being unable to have a hot shower or cup of tea in the morning because the supply has disconnected overnight, to suddenly being disconnected while watching a DVD with friends. This is reflected in the fact that 19 per cent of households reported having been unable to have friends round. 15 per cent of self-disconnecting households where children were resident also felt that this had prevented children from completing their homework.

Financial impacts

5 per cent reported having missed a rent payment and 2 per cent a mortgage payment in order to be able to top-up the meter. One-fifth of self-disconnecting households reported having missed payments on other bills such as council tax or credit cards. This indicates the extremely precarious financial position that some households find themselves in. Missing a rent payment or credit card payment can often cause further financial problems as the householder may accrue (more) interest or penalties on those debts or, in extreme cases, be taken to court for non-payment.

Emotional and psychological impacts

Almost half (47 per cent) of self-disconnecting households found the experience of being disconnected a stressful one. This was largely related to financial concerns about being able to top-up the meter, although 28 per cent found the practical issues associated with having to top-up to be stressful.

Almost half (49 per cent) of all self-disconnecting PPM households agreed that keeping the meter topped-up and connected was a major concern in their daily life. One-third of self-disconnecting householders reported feeling embarrassed that their supply was sometimes disconnected.

It has already been discussed that mental health problems can be a contributing factor leading to a self-disconnection event. However, self-disconnections can, in turn, have a negative impact on the mental wellbeing of those who experience them.

The qualitative research revealed that for a small minority, being disconnected from the supply engendered feelings of being unable to cope or feeling 'low' and could compound pre-existing depression. Self-disconnection for many of these customers is 'yet another problem' that they have to deal with in their lives. Once again, it was those customers on the lowest incomes, who appeared to be most affected in this way.

'It can be quite depressing if you can't go anywhere and you can't do anything ... It impacts on your mood. Your mental health starts to suffer because if your mood is low then you get depressed and down sometimes, especially when it is dark when you are coming home and you can't go out anywhere ... It just makes you feel fed up and really low. I do get low because we can't do the things that we used to do.'

Male, 45-54, North West England

Nonetheless, as shown with respect to self-rationing, the qualitative research revealed a great deal of stoicism and acceptance of 'the way things are' and for the majority of households this also applied to self-disconnection.

'It does annoy you, but you can't stay upset about it. You have got to move on, because they are not going to lower the price.'

Female, 25-34, South East England



Section 4: Getting help or advice

Suppliers

Contacting suppliers can be a challenge

Just under one-third of self-disconnecting households had ever contacted their supplier seeking help or advice in relation to their PPM, mainly about issues related to finance. Half of those contacting their supplier judged them to be helpful. However, the qualitative interviews revealed that for those experiencing extreme financial hardship, simply contacting the supplier could be a challenge in itself.

'I am waiting for them to get back to me and no one has got back to me. I have tried to phone up and you get through to an automated service... Three times and I never got anywhere... You get different menus and then when you wait for an advisor to speak to you, you sit listening to music and that is maybe £3 spent.'

Male, 35-44, Scotland

External organisations

Asking for support was relatively unusual

One in five self-disconnecting households had sought help or advice from an external organisation with regard to their energy usage, costs or disconnections. Electricity customers were more likely to contact an organisation for help (26 per cent) than gas customers (10 per cent).

Those making enquiries were most likely to do so at the Job Centre (6 per cent of self-disconnecting households), followed by a social worker (5 per cent) followed by the Citizens Advice Bureau and Consumer Direct, each contacted by 4 per cent of self-disconnecting households. The fact that a wide range of external organisations was mentioned suggests that no single body comes immediately to mind when thinking of who to consult for advice.

'I didn't know that you could [go to the CAB]. I didn't know that they could help you. If you have run out of the emergency [credit] I didn't know that you could be helped.'

Female, 25-34, Wales

Section 5: Participants suggestions to improve the PPM experience

Better information and support

When asked in the in-depth interviews what could be done to improve their experience of using a PPM, there were four clear areas where consumers felt they would benefit from further information:

- How to operate the meter – Probably due to the high proportion of ‘inherited’ PPMs, very few participants had ever seen written instructions telling them how to use or manage their meter, and some in the qualitative research explained having to figure out the operation and management on their own. There was a similarly low level of awareness of standing and other fixed charges. More support from suppliers would be helpful
- Ongoing dialogue between suppliers and PPM users – Some PPM users felt that once a meter was installed energy suppliers ‘stopped listening’ to their customers, and the in-depth interviews suggested that users wanted to be able to communicate with their suppliers, and have a more open dialogue
- Status of debt – Where PPMs were being used to repay an energy debt, awareness of the outstanding amount and date by when the debt would be cleared was very low. Not one of the qualitative research participants recalled receiving correspondence to tell them how much of their debt they had repaid, or when they were scheduled to clear it

‘They didn’t actually explain to me how to use it either. I had to find that out myself. All I knew was that £6 had to be on there on Tuesday at midnight.’

Female, 25-34, Wales

- Impartial information about tariffs and energy efficiency – Many participants expressed an interest in increasing their energy efficiency through day-to-day actions, and would appreciate advice on ways to do this that they might not know about. Some wondered about the energy consumption of specific household appliances. There was also an appetite for impartial information about different suppliers’ tariffs for gas and electricity

Practical measures to make day-to-day management easier

The qualitative research uncovered a number of practical measures identified by PPM users that they felt would make day-to-day management of a meter easier and reduce the risk of disconnection. These included; gas meters to provide a warning when credit is running out; the ability to switch back to a credit meter without paying a charge, especially when a PPM has been inherited; and alternative ways to top-up. Alternative means to top-up was particularly identified by those suffering from health conditions, and mothers with young children, as a practical measure that would make a positive difference.

PPM users want lower prices and increased benefits

Most frequently, PPM users voiced their wish for reduced energy prices, or increased benefits: these were, to consumers, the most obvious ways in which the Government and the energy suppliers could help improve their situation. While it would be unrealistic to expect energy suppliers to drop prices as a response to the report, particularly for one group of consumers, it does underline the fact that for a number of PPM users, there simply is not enough money to make ends meet in their daily lives.

Key conclusions

Over 500,000 households in Great Britain are self disconnecting

16% of all PPM consumers had self disconnected at least once in the last year.

Latest Ofgem figures¹⁶ states that there are 6.2 million PPM customers in Great Britain, which equates to approximately 3.2 million households. Based on the statistics in our research this means that potentially over 500,000 PPM customers are self disconnecting.

A small but significant minority of PPM households self-disconnect frequently or for extended periods of time

Prolonged, endemic self-disconnecting from a gas or electricity supply is a problem for only a small sub-group of PPM households: just 27 households out of a sample of more than 700. This small minority is, nonetheless, a particularly vulnerable group, struggling against its circumstances to fulfil basic energy needs.

Half of all PPM households engage in self-rationing behaviour, at least in part to try and keep their PPM connected to the energy supply

With 45 per cent engaging in self-rationing of energy and 20 per cent engaging in other kinds of self-rationing to limit their financial outgoings, many PPM households are making significant compromises in daily life. It is reasonable to assume that at least some of these households would self-disconnect if they did not engage in (sometimes quite extreme) self-rationing behaviour.

Despite the manifest problems of having a PPM (at least for some households), satisfaction with PPM meters is high and many of those who have experienced problems do not wish to lose the advantages the meter confers

Half of all PPM households were satisfied with their meter and the majority of the remainder were ambivalent. 15 per cent were dissatisfied, rising to 30 per cent of households which had self-disconnected. However, despite the inconvenience and other problems associated with having a PPM, even dissatisfied households often considered that the increased ability to manage their budget (and cope with life on a low income) outweighed the disadvantages.

The perceived performance and behaviour of suppliers is mixed

Suppliers do not appear to have been successful in ensuring that customers understand much about the way their PPM operates and the charges involved, or in keeping customers up to date and informed about their energy use and debt repayments. Furthermore, those who had ever felt the need to contact their supplier had, in half of all cases, found the experience to be less than helpful.

While over a half of PPM customer paying back a debt were satisfied with their repayment level, the remaining half experienced little consultation about debt repayment levels and some consumers (14 per cent) were actively unhappy with the rate set. This is worrying as those who claimed their debt repayment level was too high were more likely to be engaging in both self rationing and self-disconnection

¹⁶ Ofgem Social Monitoring Statistics, Q3, 2009

On the positive side, there is little evidence of ‘bullying’ on the part of the suppliers, even where meters have been fitted for debt collection; just 2 per cent of PPM households claimed that their energy supplier had insisted on installing a PPM. A slightly higher proportion of PPM users (4 per cent) reported agreeing with the supplier that they would have a PPM installed.

The issue of privately rented accommodation

PPM users who live in privately rented accommodation experience a combination of factors that are unfavourable to their cost-efficient use of energy. They tend not to have a choice about whether or not to pay for energy via a PPM; more than half of all private renters said their landlord had installed the meter and that they were not allowed to remove it.

Privately rented accommodation was also less likely to contain any energy efficiency measures, meaning that PPM users in these properties needed to spend more money on heating their homes. Landlords probably have less incentive to install insulation in these properties because they are not occupying them personally. However, tenants are unlikely to be allowed to make improvements to the property, even if they are willing to pay for them.

Those in privately rented accommodation were the most likely to be self-rationing (59 per cent). They were also more likely to be self-disconnecting (22 per cent) than those in local authority housing (15 per cent) or owner-occupiers (10 per cent), although not more likely than those in housing association properties (22 per cent).

Consumers that are self-disconnecting don’t know where to go for help

There was a low level of awareness among consumers that were self-disconnecting of organisations they could contact for help and advice; they were unlikely to approach Consumer Direct, the Citizens Advice Bureau or any other consumer advisory body to discuss problems with their meter or paying for credit. Contact with suppliers is limited as well; even among those households that had self-disconnected, only one third had contacted their supplier, and just half had found their supplier helpful.

At present there appears to be a ‘vicious circle’ whereby the most vulnerable customers may be entitled to help but suppliers can only offer that help if they are aware of the customers’ circumstances. Customers are unaware that support mechanisms exist, and either are not being reached or are not engaging with relevant communications. As a result they do not make the necessary call.



Our recommendations

Improving the way prepayment works for consumers

Our research uncovered many frustrations experienced by PPM customers about the way their meters work. Many consumers are satisfied with their PPM as it increases their ability to manage their budget and avoid debts. Despite this, PPMs are often viewed as inconvenient and out of date when compared with other pay as you go technology such as mobile phones. Energy suppliers have failed to keep up with modern technological advances that would improve the experience of PPM use for existing and potential consumers.

Consumer Focus has identified a number of relatively simple changes that suppliers and others can make to improve the way PPMs work for everyone. These changes could also help to reduce the number of self-disconnections that occur simply because consumers find PPMs in their current form inconvenient and incompatible with their lifestyles.

Energy suppliers

- It should be obligatory for suppliers to carry out a more detailed check for vulnerability before a customer has a PPM installed (or is switched to prepayment using a smart meter capable of remote switching to prepay). As a minimum this should reflect the best practice vulnerability check list highlighted as part of the Consumer Focus/Ofgem Fast Track Review of Vulnerable Disconnections 2009
- Suppliers who do not already do so, should extend 'friendly credit' on electricity prepayment meters between the hours of 6pm and 9am during the week and 6pm Friday until

9am Monday and on public holidays in line with good practice already operated by one supplier, so that households are not cut off during night-time hours or at weekends

- Suppliers should investigate offering a range of top-up methods in addition to cash, such as via the internet, SMS/text, mobile phone and via cash points. This should not result in a decline of availability of cash top-up facilities but rather an increase in choice of payment methods in line with prepay mobile phones
- Where a PPM is due to be installed or removed a fully smart meter should be installed which is capable of switching remotely between credit and debit options. This will help to remove the barriers to consumers switching payment methods, as the meter will no longer have to be changed over in order to switch payment type
- Where suppliers require a security deposit to exchange a PPM for a credit meter this should be applied in a proportionate manner that reflects the consumer's individual circumstances.

Pay Point/PayZone

- Paypoint and Payzone should consider extending the range and type of points of sale where credit can be purchased, as well as the way in which payment can be made. For example:
 - Increased presence in a wider range of major supermarkets and other national chains, however this should be sensitive to the viability of the existing network of outlets
 - An increase in the outlets that allow payment by debit card or pre-paid credit card as well as by cash
 - Improvement in Paypoint/Payzone coverage in rural areas

Government/Consumer Focus

- The Government and Consumer Focus will carry out further work on a bank account that is responsive to the needs of low-income consumers, featuring a custom bill payment method built on the principle of control over outgoings, and to be delivered via the post office, to enable an alternative secure payment method to PPMs for low income consumers

Protecting vulnerable consumers

Vulnerability can exacerbate problems that consumers are already experiencing with their PPMs. Our research highlighted the fact that consumers on the lowest incomes and those who suffered from health problems were more likely to experience self-rationing, self-disconnection and have difficulty with using and operating their PPM. Some consumers had become vulnerable through ill health or a change in circumstances so where a PPM was once a viable option it was now proving difficult or impossible for them to manage. Many of these vulnerable consumers felt isolated and abandoned by suppliers in their daily struggle to keep their meter topped up with credit.

Protection and help for vulnerable consumers needs to be improved and expanded, especially for those in marginalised groups.

Energy suppliers

- Where vulnerability is evident or established, suppliers should take every effort ensure that a PPM remains the most suitable payment option and ensure other options such as weekly payment cards or Fuel Direct are made available to the consumer

- Where vulnerability has been established and a prepayment meter is being installed (or the customer is being switched to prepay) for the repayment of a debt, suppliers should provide the consumer with the following for free:
 - A full benefits check or referral to a third party organisation that can provide this
 - Energy efficiency advice and advice on entitlement to energy efficiency measures under schemes such as Warm Front, CERT or schemes run by their local authority
 - Advice on the lowest cost tariff available for the payment method of their choice; including social tariffs if the consumer meets the eligibility criteria
 - A standalone display, where the customer has a smart meter and they don't already have a display
- In line with good practice outlined in the joint Consumer Focus/Ofgem Fast Track Review of Vulnerable Disconnections 2009, following the installation of a prepayment meter for debt (or switching to prepayment), every opportunity must be taken by the supplier to establish vulnerability and suitability of prepayment as a payment method.
- Where a change of circumstances or a change of occupancy results in a consumer experiencing difficulties using a suppliers should not charge a removal fee to exchange their PPM for a credit meter
- Suppliers should use every opportunity to gain a better understanding of PPM users' circumstances, and periodically check for any changes to vulnerability in the household. New vulnerability check lists that can be used over the phone and online should be developed in co-operation with Ofgem and consumer groups for this purpose

Government

- The Government should oblige suppliers to provide social price support to all groups that qualify for cold weather payments and households in receipt of means tested benefits with children under 16¹⁶
- Local authorities should make more efforts to enforce Housing Health and Safety Rating Scheme (HHSRS) requirements with respect to private rented properties identified as a Category 1 health hazard in terms of cold and damp
- Energy efficiency programmes such as Warm Front and CERT should target PPM users in or at risk of fuel poverty, particularly those who live in rented accommodation and may not know that they are able to have improvement works carried out without their landlord's permission

Improving information and advice for prepayment customers

Many consumers said that they had never received communications of any kind from their supplier. While suppliers all send out communications and advice, particularly at the point of installation, it may be that many PPM users are resistant to current forms of communications, and do not recognise or read any annual information they receive. This can be more of a problem for households that inherit a PPM or in rented accommodation where turnover of occupancy is high.

The research also showed that PPM users who needed assistance had limited contact with suppliers and were unlikely to approach advice bodies such as Consumer Direct or Citizens Advice for help.

Communications with PPM users need to be more frequent and clearer. PPM users who require help need to know that they can approach their energy supplier or other organisations for assistance.

¹⁶ Cold Weather Payments are paid to households in receipt of pension credit or income related employment and support allowances for every week of cold weather (below 0° Celsius for seven consecutive days)

Energy suppliers

- Suppliers need to explore ways of improving their existing written communications and making them more accessible as the current postal method is not reaching large numbers of prepayment customers. In addition to the annual statement they already send suppliers should provide the following to consumers, where relevant, in an easily accessible form:
 - The total amount of debt outstanding and repayment rate
 - Any standing charges that apply to the consumer's tariff and how they are deducted.
 - A supplier telephone number (freephone for all consumers, from both landlines and mobile phones) for information and advice
 - Confirmation of the amount of emergency credit that is available on their PPM
 - Information leaflets about how to work their PPM (this should be provided not only when the consumer first has a PPM installed but also when they change supplier or have to have an engineer come out)
- Suppliers should place information stickers on all new prepayment meters, which identify a supplier contact number (freephone for all consumers, from both landlines and mobile phones) for consumers to call if they are self-disconnecting or are in financial difficulties. This should also include the number for an independent advice on better energy efficiency such as the Home Heat Helpline
- Suppliers should advertise their own freephone telephone helpline for customers on the top-up receipts and where applicable, in the case of smart prepay customers, their energy display

- Suppliers need to make a concerted effort to improve the availability and quality of advice and support given to PPM users, not just at the point of installation but as an ongoing service

Consumer Focus, other consumer bodies and advice agencies

- A concerted campaign should be devised by Consumer Focus and advice agencies to advise PPM users of their rights, and to encourage, vulnerable consumers and prepayment households that self-disconnect to contact their suppliers or other advisory organisations
- Consumer Focus, Consumer Direct, energy suppliers and other advice organisations should work together to improve the quality and reach of help and advice offered to PPM users and to vulnerable, marginalised groups
- The research found that private tenants experience a combination of factors which can often mean they are the most disadvantaged PPM users. Consumer Focus will develop an information campaign to advise private tenants of their right to choose their energy supplier and payment method and entitlement to help such as energy efficiency grants and benefits

- Consumer and environmental groups, in conjunction with suppliers, should develop a consistent set of energy efficiency messages to help consumers cut their energy consumption and where possible information about the cost of running household appliances. This information should be available to all PPM users in a clear user friendly format and via a variety of media. Consideration should be given as to whether information should be included with the annual statement, at the point of installation of the meter and signposting on the top-up receipt

Government/advice agencies

- Government and advice agencies should promote information for both tenants and landlords on the incentives that are available to landlords to improve the energy efficiency standards of private rented accommodation. Further interest could be generated by the inclusion of energy performance certificates (EPC) in the marketing of properties for sale or rent, as recently proposed by the Department of Communities and Local Government. Potential new occupants should also be made aware of improvements recommended by EPCs

Using Smart technology to improve prepayment

Smart meters, with their improved functionality allowing for real time monitoring of energy use, expansion of top-up possibilities and a reduction of the costs of PPM infrastructure present a real opportunity to improve the lot of PPM consumers and address some of the issues raised in our research. However, more work needs to be carried out to ensure that this opportunity is fully realised, and that vulnerable users of PPMs enjoy greater rather than lesser protections.

Consumer Focus

- Consumer Focus to work with suppliers, Government and the Ofgem to ensure that the opportunity presented by smart meters to improve PPM technology is fully realised. Also to ensure that protections for vulnerable consumers are in place

Our smart meter recommendations are set out in full detail in Annex 4: Using smart technology to improve prepayment

Annex 1: The research

Background to the research

To date there has been relatively little research into the extent of problems with PPMs and the affects of self-disconnection. Before commissioning new research, we looked at cases received by our Extra Help Unit¹⁷ and the Citizens' Advice Bureaux, as well as from Consumer Direct¹⁸.

Although these cases showed the detriment caused by self-disconnection to the most vulnerable consumers, it was difficult to quantify how widespread self-disconnection was among PPM users as a whole. The consumers whose case studies we looked at were also those who had been motivated to seek help either because they were aware of where to go to find this help or the extreme seriousness of their situation.

We also analysed previous research that pointed to self-disconnection as a potential cause of detriment for consumers with prepayment meters.

The decision to carry out further research in this area was motivated by a number of different factors:

- 1 No comprehensive, GB-wide research had been carried out in the last decade
- 2 We were aware that an increased number of PPMs were being fitted for debt
- 3 We assumed that the worsening economic situation would lead to even more PPMs being fitted for debt, and put more consumers at risk of self-disconnection

We wanted to clarify whether self-disconnection only affected a small minority of particularly vulnerable consumers, or whether it was a wider problem. We also wanted to understand the whole range of consumer experience; ranging from occasional self-disconnection to regular self-disconnection lasting for extended periods. Consumer Focus therefore decided to commission research in order to ensure a robust evidence base on which to base campaigning and policy-making activities.

This research was jointly undertaken by Consumer Focus and Consumer Focus Wales.

In parallel to this research, we also spoke to the 'Big Six' energy suppliers (British Gas, EDF Energy, E.ON, npower, ScottishPower and SSE), to better understand their policies towards customers with PPMs. There was no supplier that was clearly 'better' than the others in terms of their treatment of PPM users. There was however a huge variation in the level of support and service given on different aspects of PPM use. For example, suppliers could adhere to what we consider to be best practice in one area, such as out-of-hours help for technical problems, but fall down on another area, such as replacing lost/stolen cards and keys. A summary of suppliers' policies is available in Annex 2.

¹⁷ Consumer Focus's Extra Help Unit takes referrals from Consumer Direct, Ofgem and the Energy Ombudsman. The Extra Help Unit fulfils some of Consumer Focus' obligations under the CEAR Act 2007, whereby we have a duty to investigate if a consumer is disconnected or threatened with imminent disconnection, if the supplier is refusing to reconnect a disconnected consumer, or if a PPM or payment system has failed. In addition, we have powers to investigate in a number of situations, including: all cases where the consumer's personal circumstances make them vulnerable; if the problem is very complex, for example involving two or more suppliers; and for vulnerable micro-businesses. See <http://bit.ly/90B2mW>

¹⁸ Consumer Direct is a Government funded telephone and online service for consumers, offering independent advice on issues including energy and postal issues. It gives consumers advice, signposts them to further sources of information if necessary, and refers vulnerable consumers to Consumer Focus' Extra Help Unit. Their phone number is printed on the back of every gas and electricity bill sent to consumers.

In order to allow research participants to answer about one particular energy type and PPM, the questionnaire focused on a single PPM type (gas or electricity) once the presence of a PPM had been ascertained and some key details captured.

This PPM, whether gas or electricity, is referred to as the household's 'PPM' or 'meter' throughout. The split between gas and electricity reference PPMs is broadly representative of the numbers of GB households with gas or electricity PPMs: one-third (32 per cent) gas and two-thirds (68 per cent) electricity.

From this point, the quantitative findings refer only to the 'PPM', as covered in the survey, regardless of whether or not a household had another meter installed as well. There are no significant differences between data for gas and electricity PPMs unless indicated in the analysis.

Research objectives

The aim of this research was to enable Consumer Focus to:

- Better understand an issue of potentially severe consumer detriment
- Provide the foundations for a robust campaign, as part of our wider project on supplier debt and disconnection policies, for changes to protect consumers who are may be disadvantaged due to their method of payment for energy

We wanted to:

- Quantify the nature and extent of 'self-rationing' and 'self-disconnection' by PPM customers
- Explore and understand the complex reasons behind these behaviours and the impact on both customer lifestyles and on physical and mental wellbeing
- Profile PPM customers engaging in both 'self-rationing' and 'self-disconnection' and identify any trends by a range of demographic, socio-economic and regional variables

Research method

RS Consulting, on behalf of Consumer Focus, carried out a total of 5,726 face-to face, quantitative interviews, and 31 in-depth qualitative interviews.

The quantitative research phase

The quantitative survey used an omnibus survey representative of all GB households to provide the necessary robust statistical evidence relating to PPM households. A face-to-face omnibus was selected to ensure that no household was excluded from the research on the basis of telephone ownership/connection.

Three waves of omnibus survey were conducted between 19 February and 11 March 2010. A total of 5,726 households were screened and 764 extended quantitative interviews (718 after weighting) with PPM users were completed.

The qualitative research phase

31 face-to-face, in-depth interviews were conducted across GB between 26 February and 12 March 2010 by the RS Consulting research team to provide in-depth probing of a targeted sample of frequent or endemic self-disconnecting households. These households were deliberately sampled to focus mainly on those which experienced extensive or regular self-disconnections. Households were also selected to ensure coverage of those in rural areas, low-income areas and where one or more residents had a chronic health condition.

The interviews aimed to understand the lifestyle, cultural, economic and other circumstances which lead to or drive this behaviour.

Interviews were conducted in:

- England – the South East (5), the North (5), and the South West (5)
- Scotland – Glasgow (5)
- Wales – North Wales (2), The Welsh Valleys (6), South Wales (3)

In addition to an in-depth interview lasting between 30 and 45 minutes, interviewers took photos and completed an observation schedule. Participants were also asked to complete a diary exercise in the week following the interview.

Rather than commissioning a separate survey, Consumer Focus Wales contributed to the research costs to ensure they had sufficient data to investigate this issue fully in Wales. This is reflected in the fact that Wales has a higher number of qualitative interviews. The results from the quantitative research are weighted to GB population.

The results are representative of GB households

It is important to note that all GB omnibus surveys are designed to be representative of the GB adult population, rather than of GB households. However, in this research individuals were answering about a shared resource and the questionnaire asked about the management and impact of PPM ownership at a household level. Individuals have therefore been used as a proxy for households in this report. In order to check that our results were not skewed by a slight under-representation of single person households, we also conducted a small verification exercise whereby the raw survey data was weighted by overall number of household residents and selected key analyses were re-run. The results of this exercise showed no significant differences when weighting in this way (with only small changes to the exact figures, usually of less than 1 per cent). We are therefore confident that the results presented in this report can be taken as representative of GB households.

Annex 2: How PPMs work

Prepayment meters (PPMs) offer consumers the opportunity to pay for their gas or electricity in advance. Consumers buy credit to top-up their PPM at a Payzone or Paypoint, which are found in a wide variety of corner shops, garages etc, or at the Post Office. In exchange for payment, the consumer will receive credit, either on a card, key or occasionally as a token, which they have to place into their meter. The consumer's payments are passed from the payment outlet to the supplier.

Once this credit has been received, the meter automatically allows energy to be used. As energy is used, the credit runs down. For energy to be available, the consumer must ensure there is always enough credit on the meter. If the credit on the meter runs out, the consumer will lose their supply until they purchase further credit.

Debt

PPMs are the most common alternative to disconnection when a consumer finds themselves in significant debt, as they can be programmed to reclaim a fixed amount each week to help consumers pay off the debt. There is no upper limit to the weekly repayment level, however, suppliers, under their Code of Practice, must ensure that the level of debt repayment is affordable for the consumer.

How electricity PPMs reclaim debt

Electricity prepayment meters reclaim debt at fixed intervals each day, along with payment for usage and the standing charge. The intervals vary from meter to meter.

For example: If a prepayment meter is set to reclaim £5 per week, £0.71 will be claimed throughout each day.

How gas PPMs reclaim a debt

There are many variations of gas prepayment meter, each of which functions differently. Typically, a gas prepayment meter week begins at 2am on a Wednesday morning. At 2am, the meter will look to reclaim the debt repayment. If this is available on the meter it will be taken automatically. If there is insufficient credit on the meter, no more than 70% of the credit will be taken to cover the debt.

Friendly credit/no-disconnect periods

These are periods where the consumer will remain on supply (for electricity), even if their emergency credit runs out. No-disconnect periods usually cover evenings, weekends and Public Holidays. This is not 'free' energy; the consumer still needs to pay for the energy they have used, although the exact way that it is reclaimed varies between suppliers and meter type. This facility is not available for gas PPMs.

Price

The costs to a supplier of running a prepayment meter are slightly higher than the costs of running a credit meter. Historically, PPM users have paid an unfair premium. A recent license condition introduced by Ofgem¹⁹ stated that pricing must be fully cost-reflective, which has gone some way to addressing this premium. For example, for a consumer with a medium gas and electricity consumption, the average annual spend on gas and electricity would now be as follows:

¹⁹ Standard License Condition 27.2A. 'Any difference in terms and conditions as between payment methods for paying Charges for the Supply of Electricity shall reflect the costs to the supplier of the different payment methods'. <http://bit.ly/acZHis>

| Payment method | Dual fuel | Gas | Electricity |
|----------------------|-----------|------|-------------|
| Monthly direct debit | £1,094 | £699 | £408 |
| Cash or cheque | £1,193 | £756 | £444 |
| PPM | £1,175 | £739 | £439 |

Prices given are for a medium user (20,500kwh per annum gas; 3,300kwh elec), on standard product for one of the 'Big Six' energy suppliers (British Gas, EDF Energy, E.ON, npower, ScottishPower, SSE). Prices are from 1 June, 2010.

Smart meters

See Annex 4.

Standing charges

Most PPMs charge a standing charge. It is deducted automatically from the credit available on the meter, regardless of whether energy is actually used. This means that if, for example, a consumer is away from home for any length of time eg on holiday, or in hospital, the meter will have accumulated a standing charge debt. The debt which has built up will generally be reclaimed the next time the meter is credited. In some cases, this could leave the consumer with very little credit for energy and requiring a further payment.

If a prepayment meter does not have sufficient credit to pay the full amount of the standing charge the supply will be disconnected.

Types of PPM

There are three different types of payment devices used to credit prepayment meters: card meters (for gas), key meters (for electricity) and token meters.

Card meters (for gas)

Consumers are given a card which is specific to their meter, which they use to purchase credit at a Paypoint or Payzone. Prepayment cards allow information such as meter readings and details of price changes to be passed between the supplier and the meter without the need of an engineer.

Details of price changes are sent between the supplier and the payment outlet. This information is then picked up by the consumer's payment card when credit is bought.

Key meters (for electricity)

Consumers are given a key which is specific to their meter. Consumers use a key to purchase credit. The key is then inserted into the meter to transfer the credit.

Token meters

Consumers buy credit in the form of token; the tokens are then placed into the meter and energy is supplied. Token meters are now being phased out. Price changes for token meters can only be adjusted manually by an engineer rather than remotely which can result in a consumer unintentionally building up a debt on their PPM.

Annex 3: Energy suppliers policies towards PPM users

In parallel to the research on self-disconnection, we spoke to spoke to the 'Big Six' energy suppliers (British Gas, EDF Energy, E.ON, npower, ScottishPower and SSE), to understand their policies towards customers with PPMs. There was no supplier that was clearly 'better' than the others in terms of their treatment of PPM users. There was however a huge variation in the level of support and service given on different aspects of PPM use. Below is an anonymised summary of some of the main areas where suppliers interact with PPM users.

Consumer Focus will work closely with suppliers in the coming months to discuss best practice and areas for improvement in the light of this research.

What happens if a consumer loses their PPM key or card, or has it stolen?

There is a lot of variation here between suppliers. A couple do not charge consumers for a replacement card/key. Others do not charge for the card itself, but charge for delivery, or a visit from an engineer. Finally, a couple have a fixed charge, which they may waive if they are aware that the consumer is vulnerable.



In terms of the timescale for delivering replacement cards/keys, four out of six suppliers give consumers the option of picking up replacement cards/keys, from either the PayPoint and PayZone networks, or from the Post Office (which network is used depends on the supplier). Some suppliers will courier cards/keys free of charge if the consumer can't access a collection point, or can visit to wind on the meter, others offer next-day delivery for vulnerable consumers (which is arguably not very helpful if the consumer is off supply). One supplier offers a different level of service, depending on whether or not the consumer lives in their ex-PES²⁰ area.

What happens if a consumer has technical problems out of hours and is off supply?

There is a huge variation between the different suppliers here; at one end of the scale, half of suppliers provide a 24 hour call centre, and are able to send an engineer out to restore supply. Another provides a call centre, which directs consumers to their electricity distributor/gas transporter National Grid if there are technical problems. At the other end of the scale, some suppliers leave nothing more than a recorded message for consumers calling out of hours, telling them to contact their electricity distributor/gas transporter or the National Grid. One supplier has a case management service for vulnerable consumers that are off supply.

²⁰ 'Ex-PES' means the area that was formerly covered by the pre competition energy supplier (eg the Public Energy Supplier)

Do suppliers ask for a security deposit to replace a PPM meter with a credit meter? How is this calculated?

Half of the suppliers do not request a security deposit to be paid to replace a PPM with a credit meter. However, it is possible that they recoup their costs elsewhere, for example by charging for the engineer's visit/removal fee. The other suppliers tend to carry out a credit check, and ask for a security deposit based on how long the consumer has been with them and their average consumption rates.

How much do consumers pay for the daily standing charge?

The majority of suppliers do not have a standing charge for gas PPMs, but most have one for electricity. Standing charges vary hugely from just under 9p to almost 46p, depending on the supplier, the region. Even consumers with the same supplier can pay a very different amount for the standing charge, depending on where they live.

How are PPM users with a debt kept up-to-date about the progress of their repayment schedule?

Most suppliers told us that consumers are able to find this information on the meter itself. However, it is not clear at what point they explain to consumers about how to find this information, and anecdotally we know that it is very difficult to find on a meter. Most suppliers send yearly information on debt repayment; only one sends a quarterly update. Some suppliers proactively contact their customers to discuss their progress in clearing the debt, and whether they are on the right repayment level.

How much emergency credit do consumers have access to?

The minimum is £5, with some differences depending on where the consumer lives; for example, a consumer living in a remote area may have access to a slightly higher level of emergency credit for practical reasons.

Are there times of day, or days of the year when suppliers have a no-disconnect period for PPM users?

All suppliers have a no-disconnect policy for some or the majority of their electricity PPMs. This usually covers evenings, Sundays and Bank Holidays. In these cases the consumer will remain on supply, even if their emergency credit runs out during the no-disconnect period. However, there is a lot of variation here between suppliers – even with the same supplier, consumers will get a different level of service depending on the type of meter they have or what area they live in. It is not technically possible to have a no-disconnection period for gas PPMs.

Annex 4: Using smart technology to improve prepayment

The Coalition Government is expected to set a deadline that every home should have smart meters installed by 2017²¹ and some energy suppliers are already rolling them out. A smart meter is a new generation of gas and electricity meter which has a range of additional functions including two-way communication between the meter and the supplier or network. Precisely what the minimum functions will be in Great Britain has yet to be decided but Consumer Focus is pressing for all new smart meters to have the ability to switch between prepay and other payment methods remotely. We believe making this functionality universal for all new meters could help address many of the problems raised by customers in this research. New separate stand alone energy displays, which will be provided with smart meters, also provide an opportunity to improve customer service and information provided to prepay users.

While new technology can be of benefit to customers it can also result in increased risks. It is for this reason that we are calling for robust safeguards to protect low income and vulnerable consumers from the misuse of smart prepayment. Our proposals outlined here are supplementary to the recommendations already suggested. They are not an alternative to the immediate improvements that can be made, which are outlined in the previous recommendations, but in addition.

Reducing the cost of prepayment

The most common cause of dissatisfaction with PPMs expressed by customers in our research was that it was 'too expensive'. Indeed despite recent reductions in the price of PPM tariffs, prepayment remains one of the most expensive payment methods. Dual fuel customers continue to pay on average £81 more than those paying by direct debit²². This additional amount is largely attributed to the extra costs associated with installing a PPM, servicing the meters and maintaining a separate infrastructure²³. However, lack of effective competition in this market has further compounded this problem as there has been little incentive for suppliers to streamline processes, improve efficiencies and introduce new technology. PPM customers have in many instances, consequently been left paying for inefficient costs to serve with lower than average customer service.²⁴

²² Update on probe monitoring: tariff differentials and consumer switching. Ref 79/10. 1 July 2010. <http://bit.ly/atDJCW> (PDF)

²³ Ofgem estimates that it costs on average £88 more to service a prepayment meter customer than a consumer paying by direct debit. IBID

²⁴ In the Energy Supply Probe Initial Findings Report 6 October 2008 p. 96 Ofgem noted 'The cost data provided to us by suppliers shows a wide range of operating costs per account, with the cost per account of the highest cost supplier around 90 per cent higher than those of the lowest – a difference of around £20 per account per year, or about 4 per cent of a dual fuel bill. Once again, this evidence is not consistent with an effectively competitive market, where we would have expected such material cost differences to have been competed away.' For example, to date there has arguably been less commercial incentive for suppliers to compete for PPM customers when they tend to be disproportionately on low incomes and relatively high debt risk. Similarly there can be few drivers to improve customer service when many consumers are effectively locked into their supplier due to high debts, or locked into their payment method, due to the high cost of security deposits should they wish to switch.

²¹ At the time of publishing, the proposed roll out deadline for smart metering was 2017. This may be subject to review as part of the Government's 2010 summer smart metering prospectus. The previous Government committed to mandate the roll out of smart meters to every home by 2020.

To reduce the price of PPM tariffs compared to other tariffs we propose the following:

Government

- 1 Pay as you go functionality should be installed as standard in both gas and electricity smart meters.

This will reduce the cost to serve of a PPM customer and also help remove barriers to competition which could further drive down prices. The Department of Energy and Climate Change's (DECC) impact assessment into smart metering estimates that the inclusion of a gas valve, which would allow prepay functionality in gas meters, could result in a 40 per cent reduction in costs to serve.²⁵ But Consumer Focus believes that the reduction in prices could be significantly greater. In addition to relatively high cost, consumer interest in prepay is currently restricted by: the hassle of having a separate meter installed to switch payment type; inconvenience of topping-up; risk of self-disconnection; and stigma associated with PPMs as the payment method of last resort for customers in financial difficulty.

Consumer Focus research indicates that at least a third of consumers may be interested in pay as you go energy if the price was comparable with direct debit and it was easy to top-up²⁶. Smart metering has the potential to revolutionise the PPM meter market in Great Britain, stimulate the growth of a genuine pay as you go energy market and in turn drive down prices.

²⁵ Impact Assessment of GB-wide roll out for the domestic sector. December 2009. p.27

²⁶ ICM online survey for Consumer Focus of 1,839 customers, March 2010. This indicated that at least a third of energy consumers may be interested in a pay as you go energy tariff (as with mobile phones) if the price was competitive with direct debit and they could top-up easily. Experience in Northern Ireland where semi-smart meters have been introduced suggests that prepay is the payment method of choice for many consumers. Around 30 per cent (230,000) of all electricity consumers were using the keypad prepayment meters by mid-2009 with new connections continuing at a rate of 2,000 per month. About 58 per cent are on low incomes but 32 per cent are middle or higher incomes including 17 per cent who are 'wealthy achievers' (Acorn classification). This is reportedly due to cheaper tariffs and a range of credit top-up facilities which have in turn removed the stigma of prepayment. Also the provision of friendly credit which means that users cannot self-disconnect at weekends or between 4pm and 8am. *Smart prepayment in Great Britain* Gill Owen and Judith Ward. Sustainability First. March 2010. This report was part sponsored by Consumer Focus.

Regulator

- 2 Close monitoring of energy companies' costs to serve, especially as the prepay market develops, including an assessment of the benefits accrued to suppliers from their customers paying upfront eg in terms of eliminating the exposure to default risk and improving their short term cash flow position.

Increasing convenience of maintaining and topping-up PPM meters

A significant amount of consumers found topping-up and maintaining their meter inconvenient, often resulting in them unintentionally self-disconnecting. Smart meters should facilitate greater flexibility and convenience of payment methods – allowing customers to more easily credit their meters to avoid disconnection or more quickly reconnect when they have the funds available. Consumers should be able to top-up via the internet, mobile phone, cash point, telephone or via their smart meter displays. While developments in non-smart top-up have been welcome, they have been slow to develop and can require consumers to purchase their own separate plug-in device.

Regulator

- 3 Monitoring must take place to ensure that an increase in top-up options does not result in a decline in the availability of cash top-up facilities or a relative increase in prices paid by those paying by cash²⁷. Ease and affordability of payment is particularly important as our research showed that those with the most constrained budgets were likely to top-up more frequently, at least once a week.

Suppliers

- 4 Careful consideration should be given to the design of new top-up options to minimise practical and technical problems and ensure that they are accessible to as many consumers as possible.

Removing barriers to switching away from prepayment

Our research found that in nearly one in three cases, the PPM had been installed by the landlord, and the occupier was not allowed to remove it. In 4 per cent of cases customers also decided to stay on prepayment because their supplier asked for a payment to change it. If a meter can be remotely switched from debit to credit and vice versa it should help remove some of the barriers PPM customers face when trying to switch payment method and access better deals.

²⁵ This is important as many of the most vulnerable consumers use cash payment. The Financial Inclusion Taskforce's Fourth Annual Report on progress towards the shared goal of banking October 2009 reports that 890,000 consumers do not have access to a bank account of any kind (that includes a savings account). The figure for people without a transactional (current account or basic bank account) account is 1.75 million. There are more people who have accounts but don't use them (ie dormant accounts), but published figures are not available. <http://bit.ly/9ez50r> (PDF)

All

- 5 Action must be taken to raise awareness among tenants about opportunities to switch tariffs and payment methods.

Smart meter displays – improving information and control

Consumer Focus has campaigned, with partners, for every customer to have a separate stand alone energy display to be installed with their smart meter. We make the following recommendations for displays in the light of findings from this report:

Government

- 6 Government must mandate minimum display functionality which meets the needs of prepay energy customers. These standards should be established following customer trials.
- 7 All displays should be prepay ready. It is not acceptable that a display has to be changed if the customer switches payment method. Minimum functionality should include:
 - Real-time usage statistics (energy and spend) in a simple format to help consumers budget more easily
 - Ability to remotely top-up via the display. More than 3 per cent of consumers reported that they self-disconnected due to problems accessing their meter and many customers have the inconvenience of meters located outside of their homes
 - Easy review of standing charges, outstanding debt and repayments. Our research showed that 28 per cent of customers did not know what their current debt repayment rate was. There was a complete lack of awareness of the exact level of debt that they had repaid and some people were concerned that they were repaying a debt that was not theirs

- A help button – including simple instructions on how to use the meter/a free phone telephone number to call (free from mobiles and landlines)
- In the case of self-disconnection of gas consumers – prompts to enable customers to safely reconnect their gas supply
- In case of the failure of in-home communications or loss of display, minimum functions should also be available on the physical smart meter
- Suppliers should offer key information to smart prepay customers via personalised prepay web pages. This should include the option to top-up online. Our research showed that three quarters of PPM households (73 per cent) had a lap top or personal computer at home and 93 per cent had some form of internet access at home or at work. Of these 43 per cent checked their bank balance online suggesting that they could benefit from online top-up. This may be cheaper than having to pay by cash and withdraw money from cash points that charge

Installation of new meters – smart meters

Suppliers/regulator

- 8 Once minimum functionality for smart meters is agreed, where a PPM is due to be installed or removed the customer should be fitted with a fully smart meter which is capable of switching remotely between credit and debit options and not be fitted with a ‘dumb’ meter. Individual customers should not be charged for this installation.

Protecting vulnerable consumers in a smart world

Almost a quarter of PPM customers surveyed (23 per cent) were on incomes of less than £9,500 with almost half (51 per cent) received some kind of means tested or disability benefit. More than a third of PPM households were also home to one or more individuals with long-term physical or mental health conditions or disability eg asthma, mobility impairment or arthritis. Their experiences and the death of the pensioner couple, Mr and Mrs Bates who died in 2003 from cold related illness because their gas supply had been disconnected, are a stark reminder of the importance of providing protections for vulnerable consumers. Robust safeguards must be put in place to prevent the misuse of remote switching and disconnection capability.

Regulator/suppliers

9 When a smart meter is installed, regardless of the status of the current occupier (whether they are vulnerable or not) or their payment method (whether they are currently a prepayment customer or not) the following must be carried out:

- the meter, wherever possible must be put in a location that would be suitable for use by a prepayment meter customer – as it could be switched to prepay at a future date
- where the meter needs to be moved and this entails an additional cost, this cost should not fall on the individual customer but spread across all company costs

- where the meter cannot be located in an appropriate location/installed in a suitable way for it to operate as a prepay meter, this must be recorded and flagged. Should the customer switch supplier or on change of occupancy, this information must be available to the new supplier, subject to appropriate data protection issues being addressed

- 10 When smart meters are installed suppliers should be obliged to report on instances of switching between prepay and credit, both the installation of new meters and remote switching between payment methods. This is to ensure that remote switching functionality is not misused and that there are no barriers to moving back to debit from prepay.
- 11 The ability to remotely switch customers to prepayment cannot result in the lessening of existing consumer protections on disconnection or choice of payment method. The existing licence conditions must be reviewed and updated to ensure that they are fit for purpose in a smart world.
- 12 Where a smart meter is installed and the switching of a customer to prepayment can be carried out remotely there should be a duty on suppliers to prove that the customer is not vulnerable. As a minimum this should reflect the best practice vulnerability checklist highlighted as part of the Consumer Focus/Ofgem Fast Track Review of Vulnerable Disconnections 2009.
- 13 Consideration should be given to ending self-disconnection for electricity customers. Instead, as an alternative to self-disconnection customers could be offered a ‘life-line of energy’ (a trickle flow) that might allow them limited use of appliances in the home eg lights and the fridge.

- 14 When smart meters are installed suppliers should monitor self-disconnection and provide information on this as part of their social action strategy. This could include the monitoring of trickle flow use with a view to more effectively targeting those in financial difficulty with assistance.
- 15 New vulnerability checklists for use over the phone and online must be developed in co-operation with industry and consumer groups. This is for cases where a smart meter is installed and the customer can be switched to prepay remotely without the need for a home visit and the current checks.
- 16 There must be careful monitoring to ensure that consumers in low income areas or with high debt risk are not forced onto prepayment or have their choice of payment method restricted. Customers should be easily able to switch both to and away from prepay.

Consumer protections must be introduced as a matter of urgency. Thousands of meters have already been installed with in excess of two million meters expected to be in people's homes by 2012.

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October 30, 2015

Ms. Susan Corbin
Service Quality Division
Michigan Public Service Commission
4300 W Saginaw Hwy
Lansing, MI 48917

Re: MPSC Case No. U-16457 – 2015 Annual Pre-Pay Pilot Program Report

Dear Ms. Corbin:

Attached please find DTE Electric Company's 2015 Annual Pre-Pay Pilot Program Annual Report as required by the Michigan Public Service Commission in Case No. U-16457. The pilot program ended as of July 24, 2015 and this report serves as the final report for the program.

Sincerely,

**Philip W.
Dennis**

Digitally signed by Philip W. Dennis
DN: cn=Philip W. Dennis, o=Regulatory
Affairs, ou=DTE Energy - Regulatory
Affairs, email=dennisp@dteenergy.com,
c=US
Date: 2015.10.30 13:04:45 -04'00'

Philip W. Dennis
Manager, Regulatory Economics

Cc: mpscreports@michigan.gov

**DTE Electric Company
 Pre-Pay Pilot (Pay As You Go) Program – 2014 Annual Report
 Case Number U-16457
 October 30, 2015**

The Order in Case No. U-16457, dated September 10, 2013, required DTE Electric Company (DTE Electric), formerly The Detroit Edison Company, to file an annual report and evaluation summarizing the information in the monthly reports and including additional information on changes in energy consumption by participants, percentage of low-income customers participating in the programs, other types of customers or customer sectors participating in pre-pay, changes in uncollectibles resulting from the program, customer satisfaction, and other relevant information.

The September 10, 2013 Order required DTE Electric to provide monthly reports that include the following information:

- Total number of customers currently enrolled in the SmartCurrents program, subdivided into number of customers receiving flat-rate pre-pay service and number of customers in the Dynamic Peak Pricing pre-pay program, further subdivided by customer class.
- Number of new enrollments in each program that month.
- Number of low-balance alerts sent that month.
- Number of customers shut off that month and the number of customers restored.
- Number of customers that dropped out of the program and why, if known.
- Total number of senior citizen and low-income customers enrolled in the programs.
- A summary of participant feedback, positive and negative, received about the SmartCurrents program during that month.
- Adjustments made to the program, if applicable.

The following is DTE Electric’s Annual Report on the Pre-Pay (Pay As You Go) pilot program. The Annual Report for 2015 covers the period from October 2014 through July 2015 when the pilot program ended.

DTE Electric Pre-Pay Pilot (Pay As You Go) Program Summary of Participation Through July 30, 2015

| Residential Class | Total Program Participation | | |
|---------------------------------------|-----------------------------|------------|------------|
| | This Month | This Year | Cumulative |
| Customers Enrolled Residential Rate | 0 | 1 | 0 |
| Customers Unenrolled Residential Rate | 77 | 119 | 621 |
| Customers Enrolled DPP Rate | 0 | 0 | 0 |
| Customers Unenrolled DPP Rate | 0 | 0 | 0 |
| Customers Enrolled Total | 0 | 1 | 0 |
| Customers Unenrolled Total | 77 | 119 | 621 |

| Active Customer Breakdown | This Month | This Year | Cumulative |
|---------------------------|------------|-----------|------------|
| - Senior | 0 | 0 | 0 |
| - Low Income | 0 | 0 | 0 |
| - Senior & Low Income | 0 | 0 | 0 |
| - All Others | 0 | 0 | 0 |

| | Monthly Alerts Sent * | | | YTD Alerts Sent * | | |
|-----------------------|-----------------------|---------------|---------|-------------------|---------------|---------|
| | 10 Day | Other Balance | Shutoff | 10 Day | Other Balance | Shutoff |
| - Senior | 0 | 0 | 0 | 0 | 0 | 0 |
| - Low Income | 0 | 0 | 0 | 0 | 0 | 0 |
| - Senior & Low Income | 0 | 0 | 0 | 0 | 0 | 0 |
| - All Others | 41 | 31 | 188 | 364 | 277 | 1981 |
| TOTAL | 41 | 31 | 188 | 364 | 277 | 1981 |

| | Monthly | | YTD | |
|-----------------------|----------|----------|----------|----------|
| | Shutoffs | Restores | Shutoffs | Restores |
| - Senior | 0 | 0 | 0 | 0 |
| - Low Income | 0 | 0 | 0 | 0 |
| - Senior & Low Income | 0 | 0 | 0 | 0 |
| - All Others | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 0 | 0 |

* 10 Day - Customer balance has an estimated 10 days usage remaining
 Other Balance - Optional days and dollars balance alerts chosen by customer
 Shutoff - Zero dollars/days balance remaining

Note: No non-residential customers are currently participating on the program.

Summary of Monthly Participant Feedback

The following represents direct feedback received from customers over the course of the past ten months as summarized by Pay As You Go Customer Representative(s).

Positive Program Participant Feedback:

- Customers find the information useful because it helps them save money on their energy bills.
- Customers are satisfied with the program because they are able to view usage, pay online, which makes it convenient and easy to use.
- The customers appreciate being able to monitor their usage and the ability to pay online.
- Customers value the convenience of being able to monitor their usage on the web.
- The customers are pleased that their account balance to-date is provided on any given day of the month.

- The majority of customers participating on the program are pre-paid ahead of the two weeks requested.
- Customer who travels appreciates the program because all the information is useful and he does not have to worry about issues with his bill.
- Customers appreciate the benefits of monitoring their daily usage to keep the cost down for their electric service.
- Customers appreciate the notifications and reminders.
- Customer is able to keep his usage down since he has joined the program by monitoring his daily usage.
- One customer said that the Pay as You Go Program has helped her manage her usage as she is on a fixed income. It has helped to lower her monthly bills.

Program Participant Feedback Regarding the Program Ending:

- A customer said that she was trying to ignore the notices she had received that the program was ending. She said she really appreciated the alerts and being able to find out her actual balances at any time during her billing cycles.
- One customer said she was sad to see the program end. She said the program was convenient and easy to use. She cited the text messages were helpful and wishes all her bills were run like the Pay as You Go Program.
- Customer said he appreciated the program as he works out of town, however, he did not get a chance to take full advantage of what the program offers.
- Customers asked why it was ending and wanted to know if we had any plans to bring it back in the future.
- A couple customers mentioned they liked being able to pay ahead on their bill without belonging to a budget plan.
- None of the customers who had a credit balance on their account requested a refund. They were pleased we would use the credit to pay on their future bills until gone.

Negative Program Participant Feedback:

- Some customers are not fully aware of the benefits offered to them through the program.
- A few customers signed up for AutoPay and just wanted to make one monthly payment. They requested to be un-enrolled from the program. AutoPay is a program disqualifier.
- Some customers would rather pay once a month instead of receiving notifications of their bill amounts throughout the billing cycle.
- Some customers are not fully utilizing the tools available to them.
- A couple customers cancelled the program because they did not want to monitor their usage and preferred to pay their bill once a month.
- Some customers feel too many alerts and notifications are sent.
- A few customers do not recognize the benefits of monitoring their daily usage.
- Some customers on the program do not find any value or benefits by paying ahead of their regular due date on bill.
- Customers feel like they are paying their bill more often than their family or friends due to the alerts and notifications they are receiving every month.
- A few customers still pay their bill by the due date as if they are not on the Pay As You Go program but use the information to track daily usage.

- Only one customer commented on that he was glad he would not be receiving any more reminders or text messages now that the program was ending.

Adjustments Made to the Program:

- Phone calls were transitioned from the vendor to the DTE Contact Center in December 2014. A small team of employees in the Kentwood Contact Center received training to handle the calls.

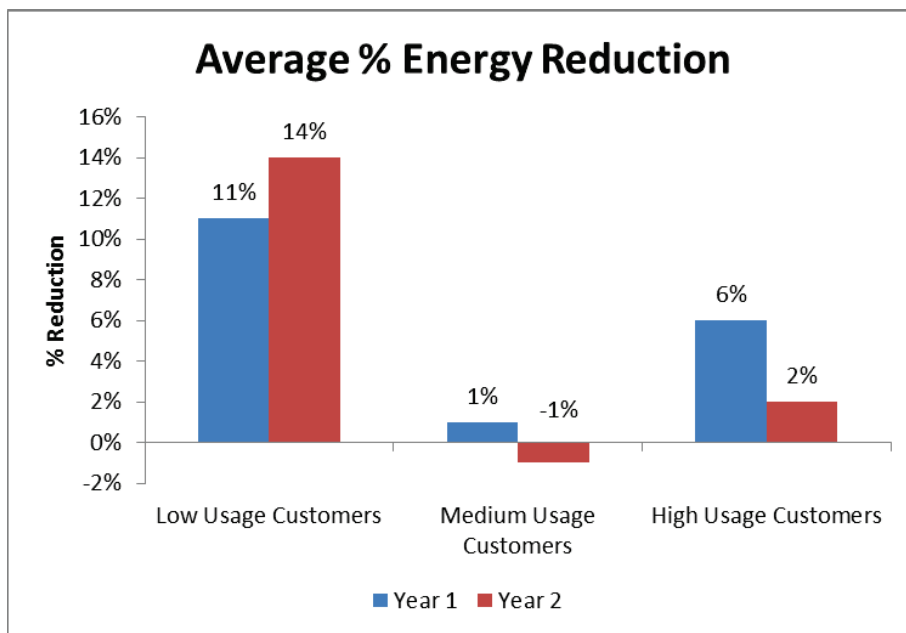
Additional Information on Changes in Energy Consumption by Participants

In the previous Pre-Pay Pilot Program Annual Report, dated October 17, 2014, DTE Electric analyzed the energy consumption of 23 customers who were enrolled in the Pre-Pay Pilot Program. To build on that analysis, those same customers were analyzed to help understand the changes that these customers continued to make in their energy consumption. However, eight customers left the program before the summer of 2015 and one customer showed an abnormal drop in load so that customer was deemed an outlier and removed from the analysis. The result of these actions left 14 customers to have their second year in the program analyzed.

To analyze the second year data, each customer's monthly bills before they enrolled in the Pay-As-You-Go program were compared to their monthly bills from the second year of being on the program. The data was then aggregated together by month and totaled, regardless of the calendar year. The kWh consumption was temperature normalized using heating degree days and cooling degree days which removed the weather variable from the energy usage. While there could have been additional factors that influenced kWh consumption such as changes in household occupancy, or new efficient appliances, it was assumed that the only influence was weather.

The 14 customers who remained on the Pre-Pay Pilot Program were segregated by their average monthly usage. Customers who were considered low users (<450 kWh per month) reduced their average monthly consumption by 14% in the second year of the program compared to the year before they enrolled in the pilot program. The first year of participating in the program revealed these customers had reduced their average monthly load by 11% compared to the year immediately preceding their enrollment in the program. Medium users (450 kWh – 900 kWh) actually increased their average monthly consumption by 1% in the second year of the program compared to their usage before their program enrollment. In comparison, these customers reduced their load 1% in their first year of being on Pre-Pay. The average DTE Electric customer falls within the medium usage range. High-use customers (>900 kWh per month) reduced their average monthly load by 2% in their second year of the program compared to the year preceding their enrollment. This is down from the 6% reduction they observed in their first year of the program. This data can be seen in Chart 1. Overall, the 14 customers averaged 8% less energy in their second year of the program compared to the year before they were on the program.

Chart 1

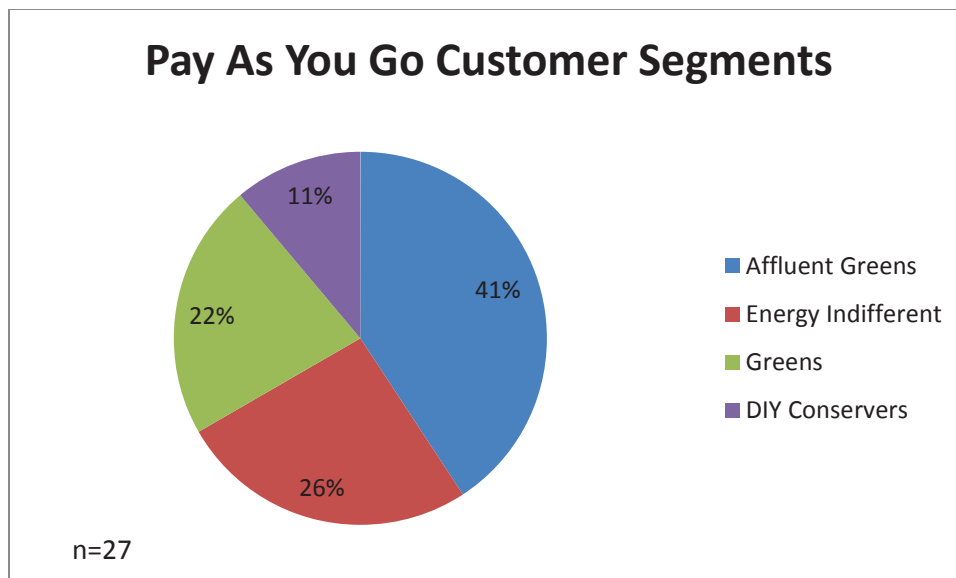


Conclusion

While the 14 customers who made up the analysis do not make up a statistically valid sample, and weather was assumed to be the only variable affecting usage levels, the customers who remained on the program until the summer of 2015 indicate a varying level of reduced energy consumption. The customers who fall in the low and high usage categories continued to reduce their load in their second year of the program. The medium usage customers who were analyzed did not see any reduced energy consumption in their second year of the program. Instead, these customers consumed more energy than they did in the year before they went on Pre-Pay. Given the small sample size it's difficult to draw any substantive conclusions regarding energy consumption behaviors. However, the analysis does seem to indicate that low energy users benefit the most in terms of energy reduction from a Pay-As-You-Go Program.

Customer Sectors Participating in Pre-Pay

As of July 24th, 27 (35%) of the 78 active Residential customers on the program, matched the secondary customer research segment data. The following graphic shows the percentage of customers identified in the respective customer research segments.



Of the 27 Pay As You Go program customers that were matched with customer segments, 41% were identified in an Affluent Green segment, 26% in the Energy Indifferent segment, and 22% in the Greens segment. Both the Greens and Affluent Greens segments tend to be early adopters, enjoy learning and trying new things, and are brand loyal internet shoppers. They are willing to spend more for energy efficient products, indicate they are likely to participate in DTE Energy's Energy Optimization programs and take advantage of the benefits of Smart Meters technology to save energy. For additional information on all the segments, see separate attachment "Residential Segmentation" summary descriptions of each of the DTE Energy segments.

Changes in Uncollectibles Resulting from the Program

There have been no changes in DTE Energy's uncollectibles resulting from the program.

Customer Satisfaction

A customer satisfaction survey was not conducted for the most recent program year.

Other Relevant Information

As of July 24, 2015 the 78 Pay As You Go customers reflected a variety of geographic communities (28 cities/townships) across the DTE Electric service territory.

| City | # of Customers | % of Customers |
|------------------|----------------|----------------|
| ANN ARBOR | 10 | 12.8% |
| FARMINGTON HILLS | 9 | 11.5% |
| NOVI | 5 | 6.4% |
| PONTIAC | 5 | 6.4% |
| WEST BLOOMFIELD | 5 | 6.4% |
| BLOOMFIELD HILLS | 4 | 5.1% |
| OAK PARK | 4 | 5.1% |
| ROYAL OAK | 4 | 5.1% |
| WIXOM | 4 | 5.1% |
| FARMINGTON | 3 | 3.8% |
| WATERFORD | 3 | 3.8% |
| AUBURN HILLS | 2 | 2.6% |
| LAKE ORION | 2 | 2.6% |
| NORTHVILLE | 2 | 2.6% |
| ROCHESTER HILLS | 2 | 2.6% |
| SOUTHFIELD | 2 | 2.6% |
| BELLEVILLE | 1 | 1.3% |
| CARLETON | 1 | 1.3% |
| COMMERCE TWP | 1 | 1.3% |
| FERNDALE | 1 | 1.3% |
| GROSSE ILE | 1 | 1.3% |
| LEONARD | 1 | 1.3% |
| MADISON HEIGHTS | 1 | 1.3% |
| MILFORD | 1 | 1.3% |
| MONROE | 1 | 1.3% |
| SYLVAN LAKE | 1 | 1.3% |
| TROY | 1 | 1.3% |
| WALLED LAKE | 1 | 1.3% |
| TOTAL | 78 | 100% |

Pay As You Go Program Summary

The Pre-Pay (Pay As You Go) Program was a voluntary program that empowered residential customers to control the frequency and amount of their payments, and provided them with access to detailed usage information to help them take responsibility and control over their consumption. The program required customers to pay in advance for their service with prepaid account balances decreasing as service is delivered.

Customers on the program were analyzed for energy consumption, customer sectors participating, and geographic community participation. In terms of changes in energy consumption by participants, while customers who made up the analysis do not make up a statistically valid sample, customers with low usage reduced their consumption by an average of 14% in the second year of the program compared to the year before they enrolled in the pilot. Customers with medium usage reduced their load by 1%. Customers with high usage were able to reduce their consumption by 2%. Although the high usage customers were able to reduce consumption by 2%, it was lower than the 6% reduction they observed in year 1. Overall, the 14 customers averaged 8% less energy use in the second year of the program compared to the year before they enrolled.

Finally, the Pay As You Go customers reflected a wide variety of geographic communities (28 cities/townships) across the DTE Electric service territory. The Top 9 cities that represent 64% of customers on the program are: Ann Arbor (12.8%), Farmington Hills (11.5%), Novi, Pontiac and West Bloomfield each (6.4%), and Bloomfield Hills, Oak Park, Royal Oak and Wixom each represented 5.1% of customer enrollments.

At the time the Pay As You Go pilot ended on July 24th, 78 customers were enrolled in the Program. Customers cited the program has helped them see the effects of their usage in real-time, not a month later when the bill arrives, and it led to increased customer awareness on controlling energy usage.

Several key learnings were identified from the pilot, with the biggest being the benefits of a prepay program can only be achieved if the technology, process and communication support can lead to a stellar customer experience. These learnings, along with others, will be incorporated into the new program when it is re-launched after DTE Electric's new customer billing system implementation in 2017.

DTE Energy®



Residential Segmentation

**Customer Research & Information
October 29, 2010 (Updated 8/2/2011)**



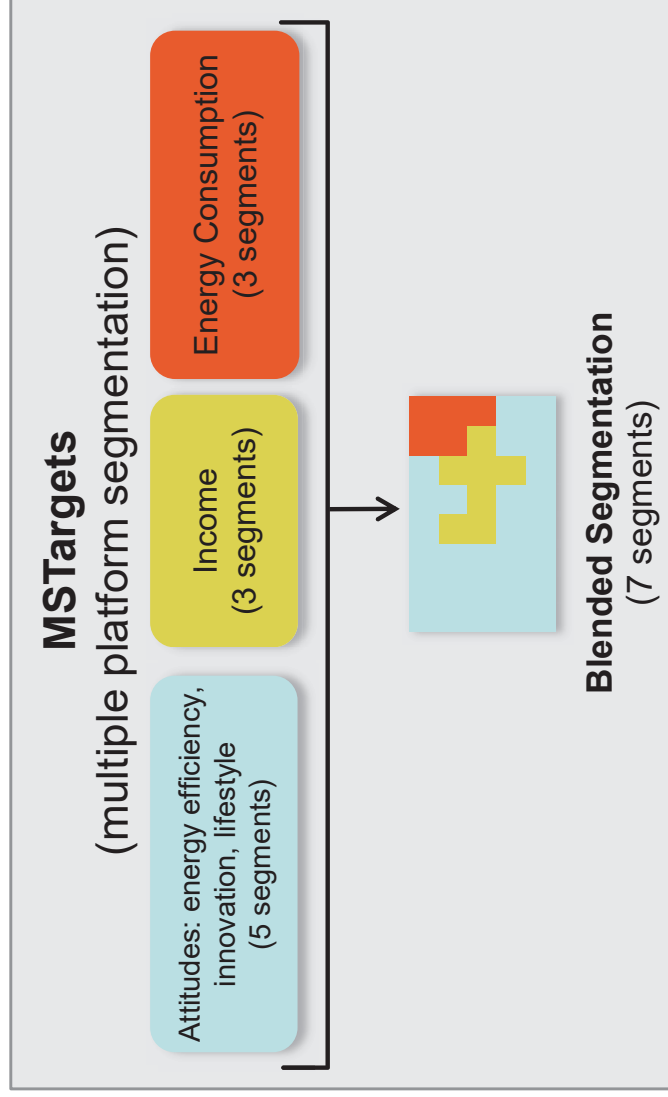
DTE Business Objectives

- Contribute to the success of residential energy optimization programs by enabling efficient targeting of customer segments with high likelihood to participate.
- Support both EO program design and communication strategies: Profile customer segments in terms of relevant characteristics and motivations, so that EO programs - and communications about them - can be customized to appeal strongly to specific segments.
- Evaluate customer satisfaction by segment, and develop strategies to increase satisfaction through targeted energy optimization programs/services and other means.
- Develop information and insights that help in marketing other DTE programs, services and technologies, for example:
 - Data on environmental views may be helpful in developing marketing strategies for renewable energy programs
 - Data on innovation and technology adoption may be useful for AMI/Smart Meter strategies

Segment Development

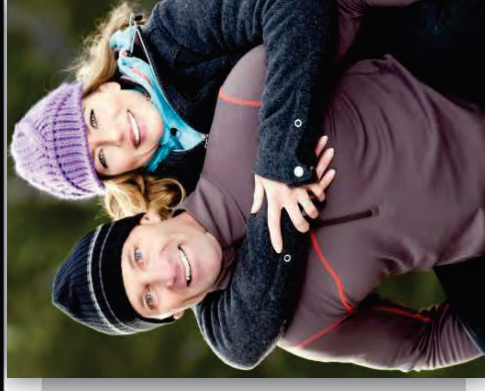


- The goal of segmentation analysis of DTE customers was to identify homogenous groups of individuals who are maximally different from each other group on multiple dimensions.
- Working with the DTE project team, these dimensions were determined to be
 - Attitudes about energy efficiency, attitudes toward innovation and new product adoption, as well as attitudes that measured lifestyles
 - Demographics: Household income as reported by customers
 - Behaviors: Energy consumption based on DTE records



Affluent Greens Segment Summary / DTE Opportunities

DTE Energy®



Key Characteristics

- About 253,000 customers, or 11%
- Highest income, highest education segment
- Most are married with kids or empty nesters
- More likely than most to have adopted some energy efficiency measures already
- 49% live in the North-South suburban region; 23% in Wayne County; few in Detroit
- About half of high income African Americans are in this segment

Attitudes, Wants and Needs

- Express average satisfaction with DE; high satisfaction with MichCon
- Feel that they are knowledgeable about conserving energy
- Tend to be early adopters; enjoy learning about and trying new things
- Brand loyal Internet shoppers, they do careful research before making a purchase
- Will spend more for environmentally friendly products
- Will spend more for energy efficient products and the Energy Star label
- Say they are **likely to participate** in DTE EO programs and use Smart Meters to save energy

Energy Indifferent Segment Summary / DTE Opportunities

DTE Energy®



Key Characteristics

- About 329,000 customers, or 14%
- Second highest income segment
- Most are married with kids or empty nesters
- Average likelihood to have adopted some energy efficiency measures already
- Half live in the North-South suburban region; 16% in Wayne County
- About half of high income African Americans are in this segment

Attitudes, Wants and Needs

- Express approximately average satisfaction with DE and MichCon
- Feel neither more nor less knowledgeable about conserving energy than the average customer
- Tend *not* to be early adopters and to like life to stay the same from week to week
- Show about average willingness to spend more for energy efficient products or the Energy Star label
- **About average in their likelihood to participate** in DTE's EO programs, but above average in saying they will use Smart Meters to save energy

DIY Conservers Segment Summary / DTE Opportunities

DTE Energy®



Key Characteristics

- About 361,000 customers, or 16%
- Moderate income, slightly below average education
- Most are married with kids or empty nesters
- More likely than most to have adopted some energy efficiency measures already
- 35% live in the North-South suburban region; 20% in Wayne County; 10% in Detroit
- Nearly half of moderate income African Americans are in this segment

Attitudes, Wants and Needs

- Express slightly below average satisfaction with DE; average satisfaction with MichCon
- Think that conserving energy is important and that they know a lot about it
- DIY oriented
- Tend to be late adopters
- Budget shoppers; may be willing to sacrifice comfort to save money
- They say they are **about average in likelihood to participate** in EO programs and slightly above average in likelihood to use Smart Meters to save energy



Key Characteristics

- About 357,000 customers, or 16%.
- Moderate income, lower than average education
- Oldest segment; almost four in ten are retired
- Distributed across all life stages, but few are married with children in the HH
- Relatively few have adopted energy efficiency measures already
- Proportionally distributed across DTE geography

Attitudes, Wants and Needs

- Slightly above average in satisfaction with DE and MichCon
- Feel that being comfortable in their home is a top priority, more than saving energy
- Tend to be late adopters and like their lives to stay the same week to week
- Do not feel knowledgeable about conserving energy, and find it difficult to understand the payback of energy efficiency
- Say they are **the least likely segment to participate** in DTE EO programs or to use Smart Meters to conserve energy



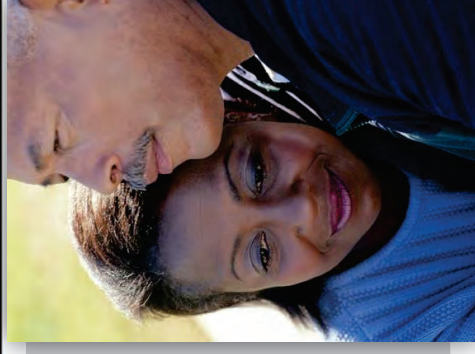
Key Characteristics

- About 424,000 customers, or 18%
- Lower-moderate income, relatively high education segment
- Distributed across all life stages, although an unusually high 13% are not married/no kids
- Slightly more likely than most to have adopted some energy efficiency measures already or say they intend to do so
- Youngest segment, nearly half under 45
- Proportionally distributed across DTE geography

Attitudes, Wants and Needs

- Express average satisfaction with DE and MichCon
- Greens are the segment most likely to self-identify as environmentalists
- Feel they know a lot about conserving energy
- Tend to be early adopters; enjoy learning about and trying new things
- Like to keep up with trends and be fashionable
- Brand loyal Internet shoppers, they do careful research before making a purchase
- Willing to spend more for energy efficient products and the Energy Star label
- Greens say they are **likely to participate** in DTE EO programs and use Smart Meters to save energy

Cash Flow Segment Summary / DTE Opportunities



Key Characteristics

- About 218,000 customers, or 10%.
- Lower income, lower than average education, high unemployment
- Distributed across all family oriented and older life stages; high proportion are “not married, have kids” (17%)
- High percentage of females, 62%
- Lower than average likelihood to have adopted some energy efficiency measures already
- Second largest segment in the City of Detroit

Attitudes, Wants and Needs

- The lowest segment in customer satisfaction - well below average for both DE and MichCon
- Feel that being comfortable in their home is a priority, more than saving energy
- Do not feel knowledgeable about conserving energy, and find it difficult to understand the payback of energy efficiency
- Like rebates and extended warranties
- They say they are **about average in likelihood to participate** in EO programs and slightly below average in likelihood to use Smart Meters to save energy

Budget DIY Segment Summary / DTE Opportunities

DTE Energy®



Key Characteristics

- About 360,000 customers, or 16%.
- Lower income segment, low education, high unemployment
- Distributed across all family oriented and older life stages; high proportion are “not married, have kids” (17%)
- Highest percentage of females for any segment , 64%
- Average proportion have adopted some energy efficiency measures already
- 35% live in the North-South suburban region; 24% in Wayne County; 10% in Detroit

Attitudes, Wants and Needs

- Slightly below average in satisfaction with DE and MichCon
- Tend to be late adopters; budget shoppers
- Believe it is important to save energy in the home
- May be willing to sacrifice comfort to save money
- DIY oriented
- Not willing to spend more for environmentally friendly products or the Energy Star label
- They say they are **slightly below average in likelihood to participate** in EO programs and in likelihood to use Smart Meters to save energy



U.S. DEPARTMENT OF
ENERGY

Electricity Delivery
& Energy Reliability

American Recovery and
Reinvestment Act of 2009

Bridging the Gaps on Prepaid Utility Service

Smart Grid Investment
Grant Program

September 2015

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- David Lewis, Tri-State Electric Membership Cooperative
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Executive Summary

A modern electric grid offers utilities and consumers wide-ranging new opportunities. Investments made through The American Recovery and Reinvestment Act of 2009 (Recovery Act) helped catalyze the transition to a modern grid by providing the U.S. Department of Energy (DOE) with \$4.5 billion to advance the deployment of smart grid technologies. This investment, leveraged with equivalent funding from the electricity industry, has helped utilities acquire and deploy technologies that enable a more intelligent electricity delivery system, including more than 15 million smart meters, 20,000 substation monitors, and 1,000 new synchrophasors.

The large-scale deployment of smart meters and supporting technology through these projects is now enabling utilities to explore new consumer-facing programs and service offerings. Consumers, in turn, have many more choices about how they purchase electricity and manage their energy use. Prepaid utility service—which allows consumers to pay in advance for their electricity—is one area where these changes converge.

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1. Introduction

Prepay is an alternative payment option in which consumers buy a dollar amount of electricity, and utilities deduct energy usage from that balance as it is used.

Consumers receive daily notifications about their balance via phone, email, and/or text message, plus additional alerts when they reach a low or zero balance. They can add money to their account in multiple ways—by paying at a kiosk, online, by phone, or even at a drive-through window at the utility office. A zero balance results in disconnection (which typically occurs the following morning); service is reestablished a few minutes or hours after a payment is received. Some prepay plans offer protections to ensure that disconnections do not occur on weekends, holidays, or days with extreme temperatures.

Prepay has gained growing attention in recent years. The industry is seeing ongoing interest in and deployment of prepay programs around the country, and both DEFG EcoPinion consumer surveys and Navigant market research show that prepay is poised for strong growth in the near term. This growth is being

The Recovery Act Smart Grid Investments

The American Recovery and Reinvestment Act of 2009 (Recovery Act) provided the U.S. Department of Energy (DOE) with \$4.5 billion to modernize the electric power grid. Under the largest Recovery Act grid modernization initiative, the Smart Grid Investment Grant (SGIG) program, DOE and the electricity industry jointly invested \$8 billion in 99 cost-shared projects involving more than 200 electric utilities and other organizations. These projects modernized the electric grid, strengthened cybersecurity, improved interoperability, and collected an unprecedented level of performance data on smart grid operations and benefits.

The Recovery Act also enabled DOE to invest \$600 million, along with \$900 million in industry cost share, in 32 Regional Smart Grid Demonstrations and Energy Storage Demonstration projects under the Smart Grid Demonstration Program (SGDP). The program's goal was to demonstrate new, more cost-effective smart grid technologies, tools, and system configurations that significantly improve on the ones commonly used.

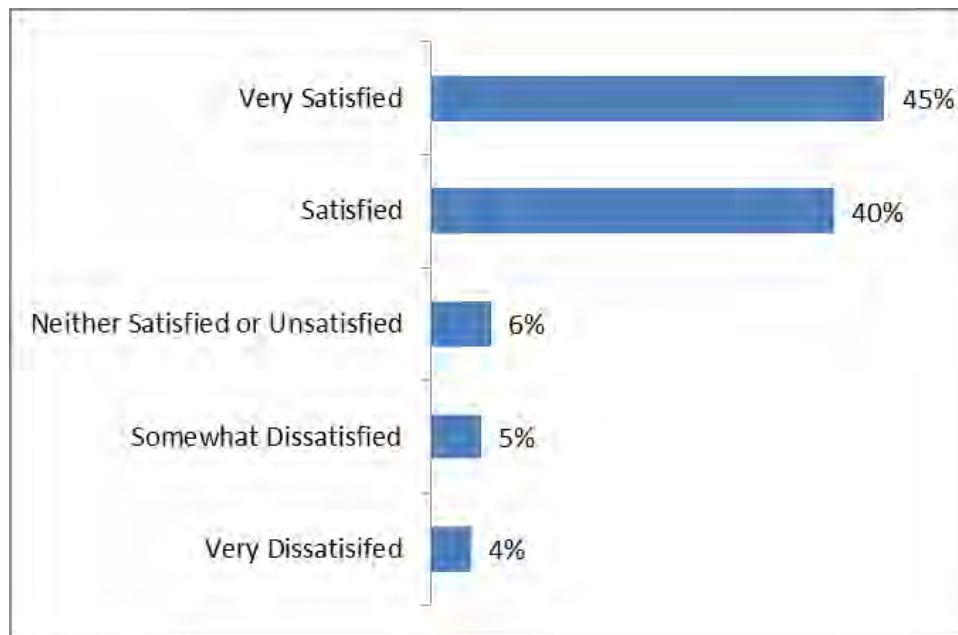
While the \$9.5 billion invested in these programs is small compared to the hundreds of billions of dollars the electric power industry will need to fully modernize the electric grid over the next several decades, these funds helped to build the smarter and more modern electric grid that will be needed to accomplish our nation's most important economic, energy, and environmental priorities.

The Recovery Act investment—the largest ever one-time investment in upgrading the U.S. electric infrastructure—helped utilities take the first steps. It mitigated some of the risk of being first and helped utilities share what they learned with others so the industry can be better prepared to meet the needs of a growing digital economy, enable greater levels of clean energy deployment, and strengthen the electric grid to be more resilient to natural disasters and cyberattacks.

More information about the impacts of Recovery Act Smart Grid investments is available on SmartGrid.gov.

driven by key technology and consumer shifts, including the rollout of advanced metering infrastructure (AMI) and other smart grid technologies, the emergence of the empowered consumer, rising consumer interest in energy conservation, and the increased use of prepay options for other services (e.g., gift cards, prepaid wireless phone service, prepaid toll collection, and reloadable debit cards)—although it should be noted that, unlike these examples, electricity is an essential service.

Experience with prepay to date has revealed some early benefits, along with areas of concern. Many utilities with prepay report positive benefits for both their operations and their consumers, including improved relationships with consumers, energy savings, and high consumer satisfaction (Figure 1). However, advocates express concern about how well prepay serves consumers and whether prepay offers “second-class utility service,” in which consumers lose key protections offered in traditional utility plans. Advocates also highlight larger issues, such as affordability, that prepay alone may not be able to address.



**Figure 1. 2008 Oklahoma Electric Cooperative Customer Survey Responses:
How would you rate your overall satisfaction with OEC prepaid?**

Source: Courtesy of Oklahoma Electric Cooperative

Communicating Effectively with Consumers: Lessons Learned through SGIG Projects

With the deployment of smart grid technologies, consumers can interact with utilities in a variety of new ways to better manage their electricity use. Prepaid utility service plans are one new option being offered to consumers. Many utilities are also implementing new time-based rate, load management, and other customer-facing programs that help customers to learn their patterns of use, understand how programs will affect their rates, and make informed decisions about energy use and participation.

These technologies and programs are only effective when customers fully understand the costs, benefits, and value proposition, and decide to play a larger role in managing their electricity consumption and costs.

Sixty-five Smart Grid Investment Grant (SGIG) projects deployed smart meters and customer-based systems that provided critical opportunities for utilities and customers alike to make smarter energy choices through access to near-real-time electricity use data. These projects have offered valuable lessons learned about communicating with consumers regarding the smart grid. Utilities and other entities can leverage these lessons learned to improve consumer engagement as part of their prepay programs.

Consumer Education Strategies

- ***Smart meter and consumer system programs involve complicated equipment and require consumers to “climb learning curves” that require extensive communication and education. Utilities must be prepared to dedicate sufficient resources to the trial-and-error of the education process.***
- ***It is essential to clearly notify consumers of their bill status if they are on prepay plans or when “critical peak events” occur. Cell phone text messaging is among the most popular and effective means of consumer notification.***
- ***There is no one-size-fits-all approach to consumer education. Utilities used multiple communication channels, including text messages, emails, apps, web portals, telephone calls, bill inserts, and social media.***

Call Centers, Web Portals, and Consumer Devices

- ***Utilities are making call centers available 24/7 and designing web pages to give consumers quick access to information about their consumption and costs. Consumers want rapid and often self-guided access to the information they need.***
- ***Consumers generally like their in-home devices, and manufacturers are rapidly making changes as projects learn more about both needed and unneeded features.***

In order to balance these issues, prepay programs may need to be deployed to meet both consumer’s needs and build in consumer protections. In considering these needs, it is important to review the lessons learned from existing prepay programs and determine ways to bridge the gaps between reported benefits and advocate concerns.

DOE conducted interviews with representatives from several utilities and cooperatives, consumer advocates, and industry stakeholders to gain a broad view of the lessons learned from prepay to date. The utilities interviewed include Rappahannock Electric Cooperative and Tri-State Electric Membership Corporation, which both received federal funding through the Recovery Act, as well as Oklahoma Electric Cooperative, widely considered by industry members to have a strong and well-established prepay program. DOE focused on coops in the interview process, because coops are at the forefront of the prepay movement. The utilities also shared supporting information (e.g., presentations, educational materials, and draft papers) about their offerings and results.

To compare and contrast the utility views, DOE also interviewed various representatives of consumer advocacy organizations, including several located in regions where prepay has been considered or implemented. DOE also interviewed the CEO of Distributed Energy Financial Group, a management consulting firm focused on consumers and consumer-facing offerings in the utility sector, to review rising consumer interest in prepay plans.

Through these conversations and with further analysis, DOE compiled and reviewed lessons learned from existing prepay programs. The analysis identified several activities that could help the industry address potential weaknesses and improve prepay programs for broader adoption.

2. Consumer benefits

The prepay model can offer several key benefits for consumers.

A greater sense of control. With prepay, consumers pay on a schedule that they establish and that better matches their needs, making smaller, more frequent payments (for example, \$50 per week rather than \$200 per month), or “setting it and forgetting it” with a large initial payment that lasts for several months. They can also customize the automated notifications they receive; for example, the preferred method (e.g., email or text message) and the dollar value that will trigger a low balance notification.

No surprises on their utility bill. Prepay prevents consumers from being burdened with a huge bill they didn’t expect and will have a hard time paying. In traditional service plans, consumers are informed of their energy usage at the end of each month, but in in prepay plans, consumers cannot accrue weeks’ worth of electricity expenses before being notified of the costs. Prepay plans provide daily information about balances, expressed in terms that make sense to consumers (dollars, not kilowatt-hours). Consumers can see charges accumulate daily and recognize how these charges are adding up and how their actions are affecting usage.

In this way, prepay can prevent consumers from always being behind. Consumers don’t owe an oversized bill at the end of the month that they weren’t expecting, and in many plans, they pay low or no reconnection fees if a disconnection occurs (Table 1). They also avoid the large late fees and initial deposit requirements associated with traditional plans.

Prepaid electricity service can be compared to buying gasoline for a car; consumers fill the tank, monitor how much remains, and refill when the tank is empty. This model allows consumers to know exactly how much they are spending up front, adjust their spending based on their budget, and buy in smaller increments depending on available income. It also keeps them from spending more than they can afford. Extending the gas tank metaphor to traditional utility service, it’s as though consumers fill the tank without knowing or paying at the time of use, and they receive a fuel bill at the end of the month that could be larger than they expected.

Table 1. A Comparison of Prepay and Traditional Plan Offerings

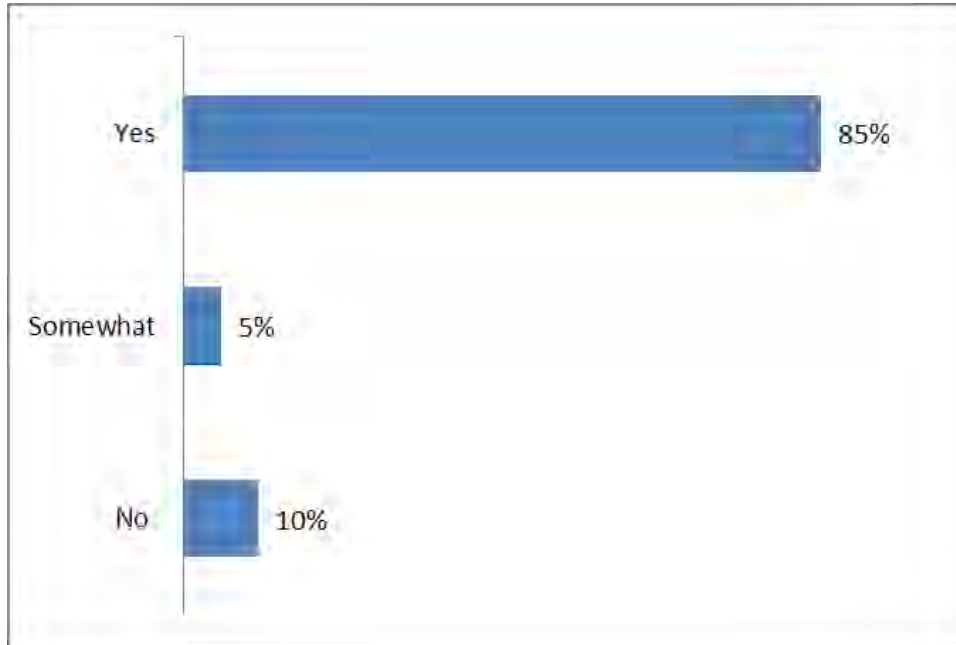
| Utility | Oklahoma Electric Cooperative | | Rappahannock Electric Cooperative | | Tri-State Electric Membership Corporation | |
|---|---|--|---|--|---|--|
| | Prepaid | Traditional | Prepay | Traditional | Advance Pay | Traditional |
| Initial deposit | \$25 suggested payment, used toward prepayment balance | Up to two times the highest estimated monthly bill | \$25 toward prepayment balance | Up to the estimated amount of the two highest usage months | None | \$100–\$300 (variable) |
| Minimum payment | None | Full monthly bill; delinquent 20 days after bill mailing date | None | Full monthly bill by due date | None | Full monthly bill, due 15 days after bill mailing date |
| Additional administrative fees | Small fee for initial connection | Small fee for initial connection | \$15 administrative fee (one-time) \$15 prepay service initiation fee (one-time) | \$0 | \$7 monthly fee | N/A |
| Late payment fees | None | Up to 10% of overdue amount | None | 1.5% of overdue amount | None | 5% of overdue amount |
| Disconnection or reconnection fees | None | \$100 disconnect fee \$100 after-hours reconnect fee Must pay all delinquent bills and collection fees | None | \$78 reconnect fee \$181 after-hours reconnect fee | None | \$65 reconnect fee \$100 after-hours reconnect fee Must pay past-due bill Possible deposit increase |
| Transaction fees | Free with cash and checks at OEC lobby kiosk. Fee for credit/debit and third party payment: PaySite® and MoneyGram® | Same as prepay plan | \$2.95 per EZ Pay online or phone payment \$1.50 per Western Union payment | Same as prepay plan | None | None |
| Can exit prepay and switch to traditional plan | Yes | N/A | Yes | N/A | Yes | N/A |

A clear link between daily electricity use and electricity spending. By providing daily balance notifications, prepay allows consumers to see cause and effect. They can more directly understand the link between how much electricity they use, the activities and behaviors that impact that use, and how much they spend.

Empowered to manage budgets and prioritize spending. With daily reporting and a better understanding of the link between electricity usage and electricity bills, consumers can better manage their household budgets on prepay. They can feel like they are in control of their electricity bill, rather than the utility. Salt River Project, which has the longest-running prepay program in the country, [reported this benefit](#) in a 2010 EPRI report. David Lewis, IT Manager at Tri-State Electric Membership Corporation (Tri-State EMC), explained that “On prepay, the conversation is different. Consumers learn how far their current balance will get them and can figure out quickly if their current balance won’t stretch” to their next planned payment.

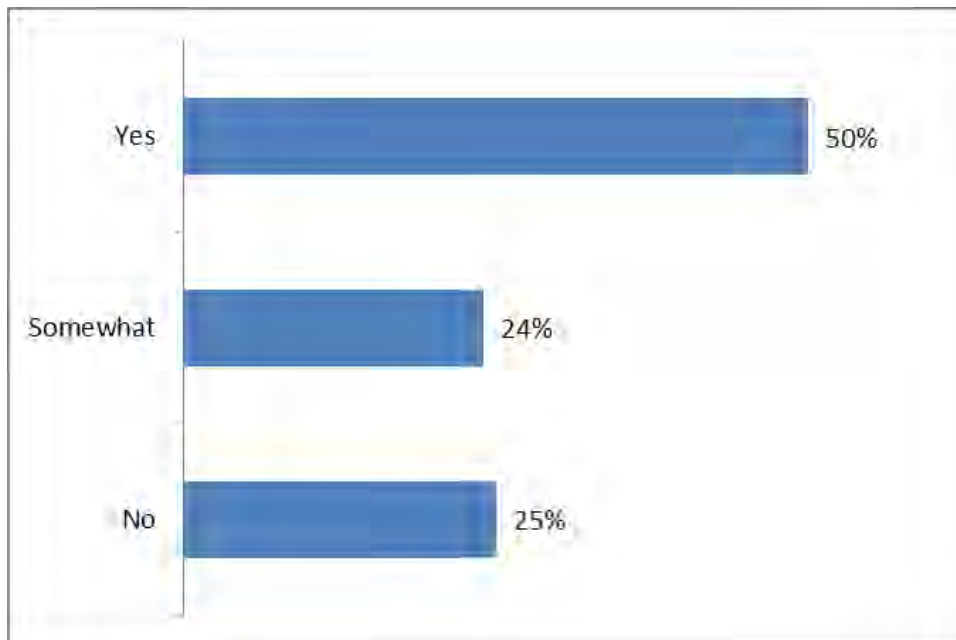
Can take action to reduce bills. Informed consumers are better able to detect changes in their electricity usage and make adjustments in the near term. This can also help them identify unexpected sources of abnormal use, such as doors left open on a cold night or malfunctioning heating and cooling equipment. “There’s something about paying ahead that makes you pay closer attention,” noted Jamie Wimberly, CEO of Distributed Energy Financial Group (DEFG).

Immediate, direct feedback has been demonstrated to lead to reduced energy consumption, which saves consumers money. Overall, stakeholders report 10%–15% reductions in energy usage with prepay. This is high compared to behavioral efficiency programs that use energy usage reports alone, which result in a 1.5%–3% reduction. In a 2008 survey of Oklahoma Electric Cooperative (OEC) prepay consumers, 85% of respondents reported feeling more conscientious and conservative about their electricity use on prepay (Figure 2), and 50% reported that monitoring usage had led to dollar savings (Figure 3).



**Figure 2. 2008 Oklahoma Electric Cooperative Customer Survey Responses:
Do you feel you are more conscientious and conservative about your use of
electricity on prepaid?**

Source: Courtesy of Oklahoma Electric Cooperative



**Figure 3. Oklahoma Electric Cooperative Customer Survey Responses:
Has your usage monitoring led to dollar savings?**

Source: Courtesy of Oklahoma Electric Cooperative

Avoiding initial fees. Utilities may require new or credit-challenged consumers to pay a large cash deposit when setting up electric service. However, these groups are often the least able to afford large cash outlays. In addition, the deposits sit idle and out of reach, when the consumer could put the money to better use in purchasing electricity or paying past debt. Prepay generally waives these types of setup fees, freeing cash for other uses.

Rapid reconnection. For consumers who experience a disconnection on prepay (due to a zero balance), reconnection can happen very quickly once payment is made. OEC reports that 43% of its prepay consumers experienced a disconnection in 2013 (Figure 4), and that 94% of its disconnected prepay members were reconnected on the same day (Figure 5), with more than half reconnected in 1–4 hours (Figure 6). And consumers in many prepay plans pay low or no fees to be reconnected.

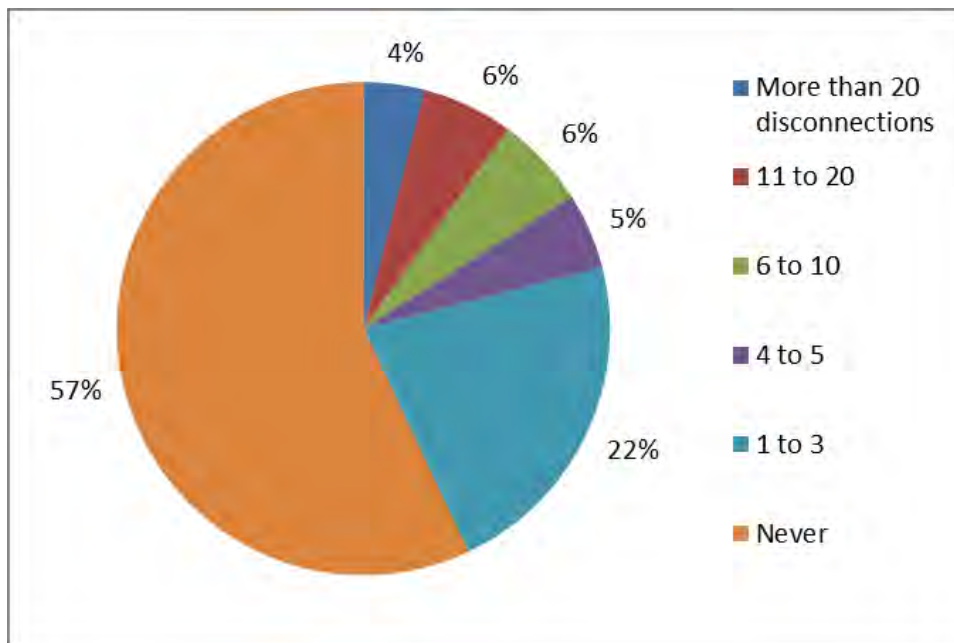


Figure 4. Oklahoma Electric Cooperative, Number of Times Disconnected for Prepaid Consumers, 2013

Source: Courtesy of Oklahoma Electric Cooperative

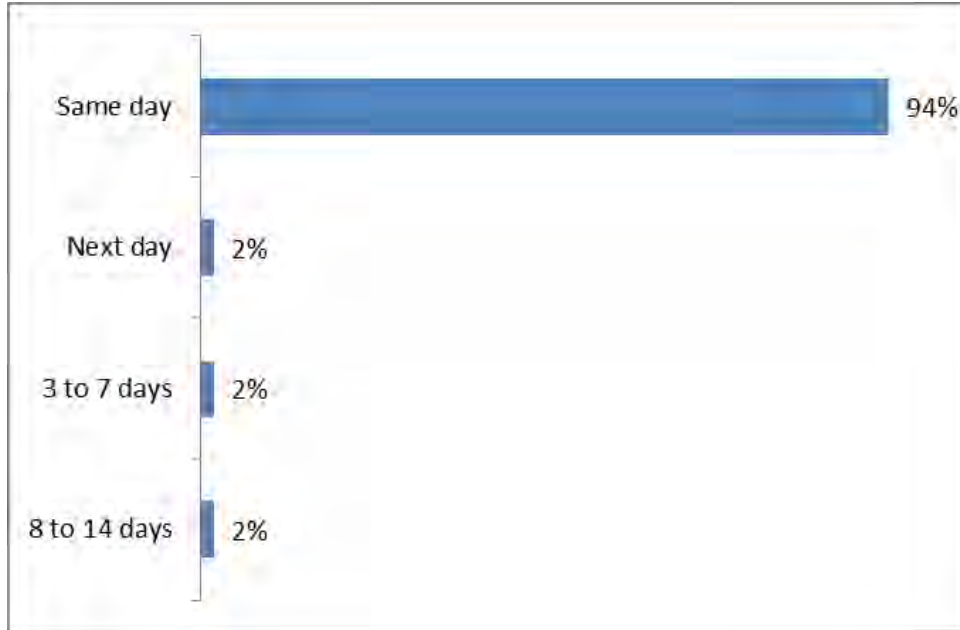


Figure 5. Oklahoma Electric Cooperative, Rate of Reconnection for Prepaid Consumers Experiencing a Disconnection, 2013

Source: Courtesy of Oklahoma Electric Cooperative

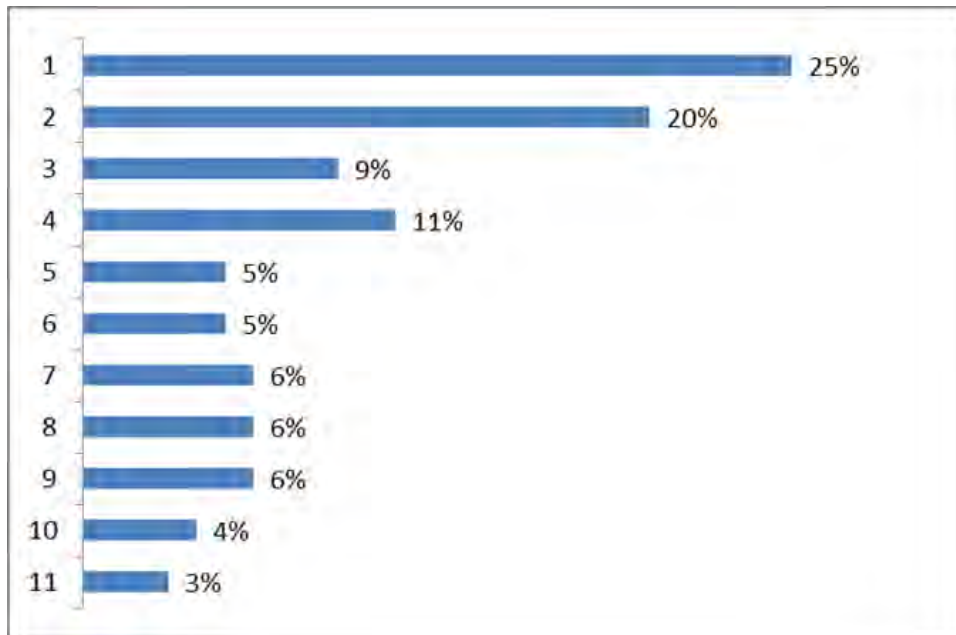


Figure 6. Oklahoma Electric Cooperative, Disconnect Duration in Hours, for Prepay Consumers Reconnected on the Same Day, 2013

Source: Courtesy of Oklahoma Electric Cooperative

3. Benefits for utilities

While prepay plans benefit consumers, they also offer benefits to utilities as well.

Better-informed consumers. Because consumers on prepay better understand the link between their usage and their spending, utilities report that they receive fewer adversarial calls from consumers, who are better able to recognize the link between their electricity use and cost, and how their payment decisions either prevent or cause disconnection. Tri-State EMC and OEC both report that after the initial rollout and adjustment period, calls became discussions of procedural issues (e.g., “I locked myself out of my account”), rather than disputes about responsibility (e.g., “There’s no way I used that many dollars’ worth of power”). Prepay can also benefit consumer service teams, giving them a new option to offer to struggling consumers.

Debt recovery through prepay payments. Some prepay plans allow consumers who owe prior balances to maintain electric service while also paying down debt. A percentage of each payment is used to purchase electricity, and a predetermined percentage goes toward the debt owed. The percentages may vary by plan or by individual (e.g., 75% toward service and 25% toward debt). Both Tri-State EMC and Rappahannock Electric Cooperative report offering this option to their prepay members. The impact of debt recovery can be notable. For example, with bad debt recovery through prepay, Tri-State EMC reduced effective residential bad debt from \$44,259 in 2011 to \$1,135 in 2013—a 97% decrease (Figure 7). And Salt River Project used debt recovery through its prepay plan to [recover more than \\$20 million](#) of outstanding bad debt

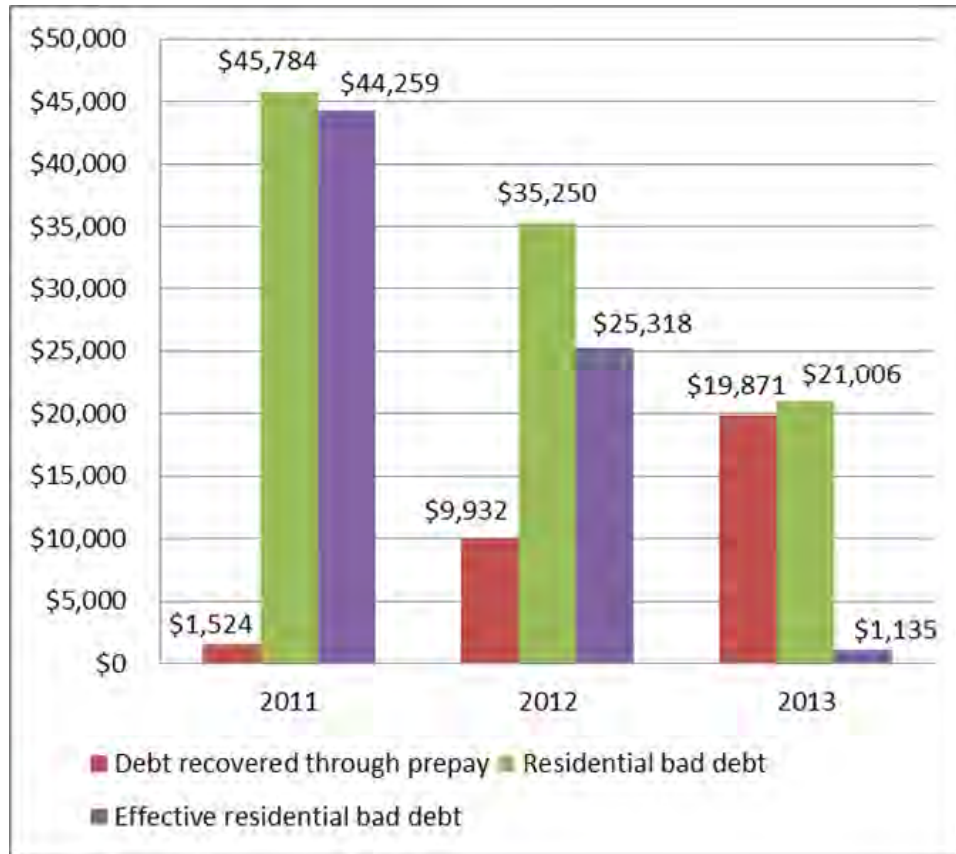


Figure 7. Bad Debt and Debt Recovery, Tri-State Electric Membership Corporation

Source: Courtesy of Tri-State EMC

Consumers can benefit from this approach, too, gaining a sense of control over their past debt while sustaining their electric service. Tri-State EMC reports that prepay consumers working to pay off debt are happy to do so, because they don't want to carry a balance owed. In fact, they feel better about how they are managing their money. Jamie Wimberly, CEO of DEFG, noted that "Low-income consumers, like everyone else, want to pay their bills, and they need new options and alternatives to do that."

Reduced write-offs and bad debt risk. Disconnections occur quickly with prepay, often no more than a few days after, and sometimes as soon as, the consumer reaches a zero balance. This shortens usage and prevents consumers from accruing large unpaid balances. As a result, prepay can reduce the utility's bad debt risk from 30–60 days of accruing balances (with traditional payment plans) to 1–4 days. Kris Sieber, Director of Member Services at Rappahannock Electric Cooperative, noted that this can benefit consumers as well as the cooperative or utility: "We want a system that not only supports members in a different way who need a different method to pay their bill and stay on track, but we also want to reduce

debt associated with the cooperative, because then we can do a better job of keeping our expenses down, which benefits all members.”

Both Tri-State EMC and OEC report significant declines in write-offs with prepay. And Tri-State EMC also reports that total bad debt is down more than 50% in 2 years, with the average residential write-off (Figure 8) declining by more than 50%. These savings can really add up. AT&T estimates that prepay would save [\\$5 million–\\$15 million a year](#) for a utility with 250,000 consumers, with 10% participating in prepay.



Figure 8. Average Residential Write-Off, Tri-State Electric Membership Corporation

Source: Courtesy of Tri-State EMC

4. Consumer advocate concerns

While utilities and consumers are reporting benefits from prepaid utility service, consumer advocates and other groups raise a number of concerns about how well prepay serves consumers. Advocates assert that the value of prepay to consumers needs to be demonstrated, and they ask why the benefits and positive features of prepay (e.g., information about daily usage and account balances, as well as shorter payment cycles) are not incorporated into traditional service.

Advocates' concerns include the following.

Equality of service. A key concern is that prepay offers diminished consumer protection and utility service—that prepay is a “subprime” or secondary class of service, with the same negative connotations associated with payday loans, predatory lending, and the like. One advocate describes prepay as “feeling like second-class service.”

Prepay often bypasses traditional notification requirements regarding termination of service. Automatic disconnections make it difficult or impossible to maintain some consumer protections, such as notifications by mail and “last knock” in-person visits that are required under many traditional payment models.

Paula Carmody, People’s Counsel for the State of Maryland and former President of the National Association of State Utility Consumer Advocates (NASUCA), commented: “Advocates consider prepay an inferior service. Those on prepay are losing access to consumer protections that other customers have.” She added that “There hasn’t been sufficient substantiation of the benefits to customers in prepay plans, in light of the risk of loss of consumer protections. And there has not been enough discussion of these issues when structuring these programs.”

Another concern is that with traditional service and without advanced meters, there is a lag between final notification and actual disconnection, which gives consumers additional days or weeks of service. This can be helpful if it gives them time to pay the bill, or harmful if it allows them to accrue larger bills that may be even more difficult to pay.

Additional consumer protection areas of concern include restrictions on terminations (such as during extreme weather or holidays), the ability to set up alternative payment arrangements, and access to and coordination with public assistance programs.

Marketing to low-income consumers. Advocates are concerned that low-income consumers may be targeted or feel forced into prepay programs because they don't have the resources to meet traditional utility payment requirements. For some consumers, prepay may seem like it is the only option, rather than a choice. Since prepay helps utilities recover outstanding balances, they are willing to wave large deposits or other fees that are associated with traditional services. Advocates argue that utilities try to entice consumers into prepay – through the waving of these fees – rather than offering other payment methods. DEFG reports that prepay plans historically have skewed toward low-income, younger, Hispanic, and immigrant consumers. For many years, advocates have expressed suspicion that prepay is marketed to these groups in particular. Advocates also express concern that prepay is really a collections program designed to handle slow-paying consumers, rather than a true service option for all consumers.

Doing without an essential service. Advocates worry that low-income consumers on prepay may go without electricity service—which is considered an essential service, particularly with regard to heating and cooling. They might forgo electricity service in order to purchase other necessities, or they may reach a zero balance and have their service disconnected because they do not have money to add to their account. A related obstacle is the potential lack of “elasticity” in energy demand for many consumers; they can't use less heat when it's cold or less air conditioning when it's hot.

- **Affordability.** Advocates also note that prepay doesn't resolve the underlying problem of utility service being too expensive for some consumers. There are also questions about whether prepay really saves consumers money; are monthly, transaction, and equipment fees making electricity service for prepay consumers more expensive than traditional plans, when added to the kilowatt-hour costs?

5. Bridging the Gaps: Resolving the Questions Around Prepay

The arguments around prepaid utility service benefits are unresolved. Utilities want to offer new services, and advocates want to ensure consumers are protected. Prepay is a new payment option that uses new approaches and technologies for payment, notification, information collection, and connection and disconnection. Like many other new services and products that are now possible with advanced technologies, prepay will not be a good fit for everyone. As early-adopting utilities report real benefits for their operations and for their prepay consumers, along with high consumer satisfaction, advocates continue to voice concerns about these plans. Several activities could help bridge these gaps and develop solutions that provide benefits and address key concerns.

Collecting and analyzing clearer, credible data on energy use and consumer behavior. There are two areas in particular where more detailed data is needed—disconnections and energy use reductions. Information needs to more precisely describe what’s happening and why (e.g., deprivation vs. energy conservation). Focus groups, surveys, reporting from existing plans and pilots, and other efforts can help shed light on why prepay leads to a reduction in energy use, as well as potential program considerations that could reduce the risk of deprivation in prepay plans without negating other positive benefits. This information could also help to determine whether specific features of prepay could be incorporated into traditional payment options to achieve similar usage reductions. These studies can aid utilities in designing services to help consumers conserve energy.

Additionally, disconnections under prepay are often reported differently than under traditional service, which can reduce the reliability of the data. They may be given other names (e.g., suspensions or voluntary disconnections) that are not required to be reported. While some utilities may be reporting them in the same way, consistent reporting rules that demonstrate when prepay disconnections occur would help to illuminate and document real loss of service, duration, and related issues. Regularly collected data, along with consistent terminology, would be key.

It may also be helpful to assess whether the concept and implications of “disconnection” have fundamentally changed. There is anecdotal evidence that consumer attitudes may be changing. OEC reports that some prepay consumers wait for the lights to go out—that’s their notification—because new automated meters and systems allow them to reestablish service very quickly. This is essentially the flip side of the deprivation argument; if disconnections are extremely short when they do happen, is it deprivation, or something else?

Demonstrating the value and accessibility of technology solutions used to communicate with consumers. The tools used for consumer interaction, such as automated notifications and online portals for accessing energy usage data, need to be convenient and easy to use. Gathering data on these tools' rate and ease of use, as well as the types of information that lead to changes in consumer behavior, can help the industry better understand how to most effectively communicate with all consumers (e.g., push notifications vs. information pulled from a website). For example, OEC reports that its web-based energy usage portal sees little use; consumers prefer to receive push notifications.

Exploring whether prepay has broader appeal, to better assess its challenges and benefits. Encouraging participation in prepay across a wider population could help determine whether prepay has broad appeal and could reveal additional benefits. Prepay participation currently skews toward lower-income consumers, in part because of the appeal of features such as no security deposit, no connection fees, and the ability to pay down prior balances over time. Westar currently has a prepay pilot underway in Kansas that requires participation by a wide range of income types and cannot include a disproportionate number of low-income consumers. Pilots of this type will help the industry better evaluate and address benefits and issues around prepay for a broader range of consumer groups, and they may also help determine how various groups benefit.

Using prepay plans as a learning laboratory. In some cases, membership in prepay seems to be the only way to access some desirable features, such as payment flexibility, low deposit requirements, low or no disconnection fees, daily reports on use/cost, and usage alerts. Learning how prepay benefits are achieved (e.g., why consumers are using less electricity) and how they can be extended to traditional service for all consumers will be important for future conservation efforts. This can also inform future programs and approaches for all consumers as well as low-income consumers; for example, the daily use notifications pushed to consumers in prepay plans could potentially benefit low-income consumers in traditional payment plans, and there may be ways to integrate flexible payment cycles into traditional service.

Addressing affordability as a key challenge in providing utility service. Spreading an unmanageable bill over a greater number of payments doesn't make the bill any more manageable. And fees associated with some prepay plans may wind up costing consumers more in the long run. The industry should investigate and test other opportunities to address affordability that don't require prepay or that can be incorporated into prepay programs, such as budget billing, special rates for low-income consumers, assistance programs, and other approaches for aligning billing options with payment issues. For example, some prepay programs currently coordinate with public assistance programs.

Assessing the level of consumer protection in current prepaid utility plans. [NASUCA](#) and the [National Consumer Law Center](#) have both recommended specific requirements or conditions for consumer protection to be included in prepay plans. To determine whether consumers in prepay are at risk, it may be helpful to create a consumer protection scorecard or a similar device, building from these and similar recommendations, and use it to assess the level of consumer protection in existing prepay plans.

Decoupling the issues of affordability and payment options. The debate around prepay often combines a discussion of two disparate issues: prepay's effectiveness as a payment option and its ability to make electricity service more affordable for low-income consumers. Decoupling the discussion of these two issues could help facilitate dialogue that may resolve opposing views on prepay and lead to better program designs for both prepay and traditional services .

6. Conclusion

Prepay programs show promise in giving consumers more control and in providing another payment option that can help support household budgeting and decision making. Many consumers seem happy with prepay; utilities have reported high consumer satisfaction. Prepay can also offer utilities benefits such as better-informed consumers, better debt recovery, and decreased bad debt risk. However, consumer advocates express concerns over prepay regarding the potential for loss of services and programs that may target low income customers, and they continue to highlight underlying issues, such as affordability, that prepay alone may not be able to address.

Additional research into consumer motivations and behavior under prepay programs could help bridge the gaps between reported benefits and advocate concerns, proving (or disproving) benefits to consumers. Working together, the industry as a whole can ensure that protections for consumers are not lost without thoughtful consideration and study, and that a beneficial service that could help consumers isn't discarded before we understand its true benefits and limitations.

Appendix A. Where to Find Further Information

| Web Links to Related SGIG Reports and Case Studies | |
|---|--|
| <p>SGIG Program Fact Sheets and Case Studies</p> | <ul style="list-style-type: none"> I. Tri State Fact Sheet II. Tri State Case Study III. REC Fact Sheet IV. Salt River Project Fact Sheet V. NRECA Fact Sheet |
| <p>Other Information on Prepay Programs</p> | <ul style="list-style-type: none"> VI. Tri State Prepay Program VII. REC Prepay Program VIII. Paying Upfront: A Review of Salt River Project’s MPower Prepaid Program (EPRI report) IX. Salt River Project Prepay Program X. NRECA - Conservation Impact of Prepaid Metering – Motivation and Incentives for Pre-Pay Systems XI. Oklahoma Electric Cooperative Prepay program XII. DEFG EcoPinion No. 21 - Give the People What They Want: Prepay Energy’s Convenience and Control XIII. DEFG EcoPinion No. 20 - New Vision Required To Better Serve Low Income Customers in Utility Sector XIV. DEFG EcoPinion No. 19 - The Conflicted Consumer Landscape in the Utility Sector XV. DEFG EcoPinion No. 18 - Prepay Energy at an Inflection Point XVI. Navigant Market Research XVII. NASUCA XVIII. NCLC XIX. CPUC – A review of Prepay Programs for Electricity Service |

FACT SHEET

IMPACT OF PREPAY
ON UTILITY ARREARAGES AND
CUSTOMER SATISFACTION



DATE

MAY 2020

INTRODUCTION

Prepay energy is increasingly being offered to customers as a voluntary bill pay option by utilities across the country. One of the primary drivers of prepay is the ability to better manage customer arrearages and bad debt levels. For the customer, prepay is an alternative to high security deposits and endless payment arrangements. Prepay has resulted in large increases in customer satisfaction. For the utility, prepay has proven to be one of the most effective means to reduce days outstanding and bad debt.

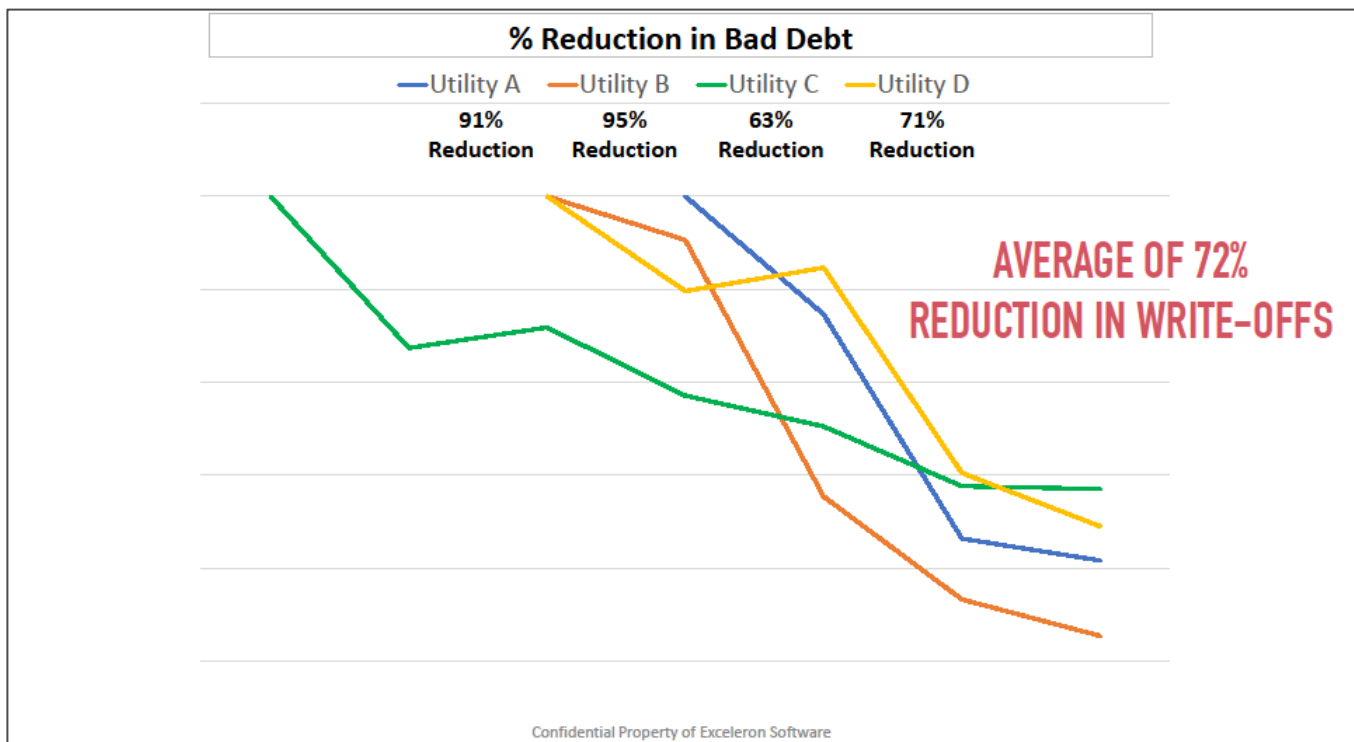
Significant Impact of Prepay Energy on Utility Bad Debt

Many utilities are just beginning their programs, so the timeframe to measure the impact of prepay energy on utility bad debt is limited. But there is growing evidence that the impact is significant and enduring.

STUDY A



Exceleron, a prepay vendor, analyzed their data for four utilities. The average reduction of write-offs due to prepay for the four utilities was 72 percent. There was a 31 percent participation rate in debt recovery which resulted in an average of \$191 of debt collected per prepay customer.



STUDY B



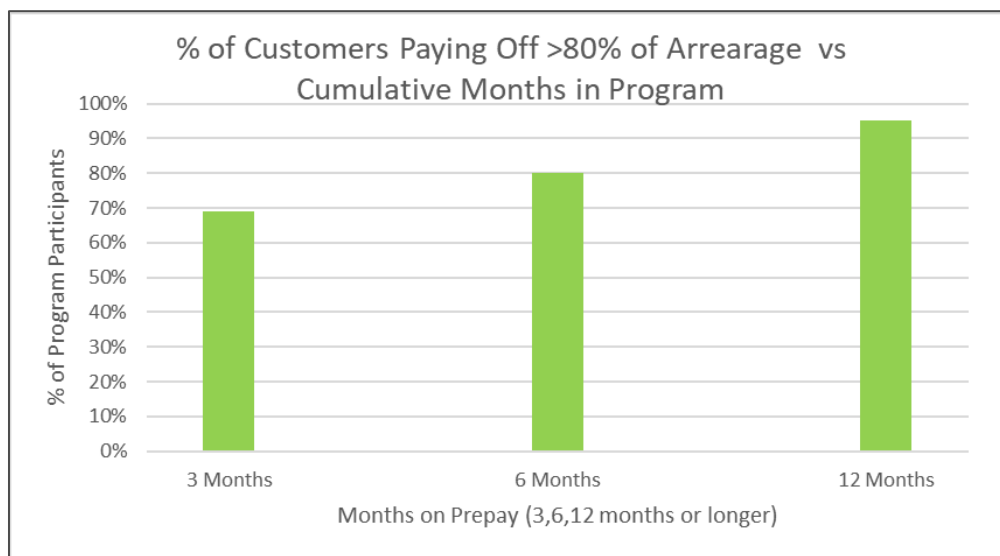
Pay Go, a prepay vendor, also analyzed data for their utility clients. Utilities using the PayGo platform for prepay programs have experienced strong results in several metrics including arrearage recovery. In these programs, a portion of each payment is used to pay down previous balances. Intuitively, the longer customers are on prepay, the higher the percentage of previous arrearages that are paid down.

The specific results for consumers entering PayGo programs with arrearages are as follows:

1

Of Prepay Program Participants that pay off 80% or more of arrearage balance over time,

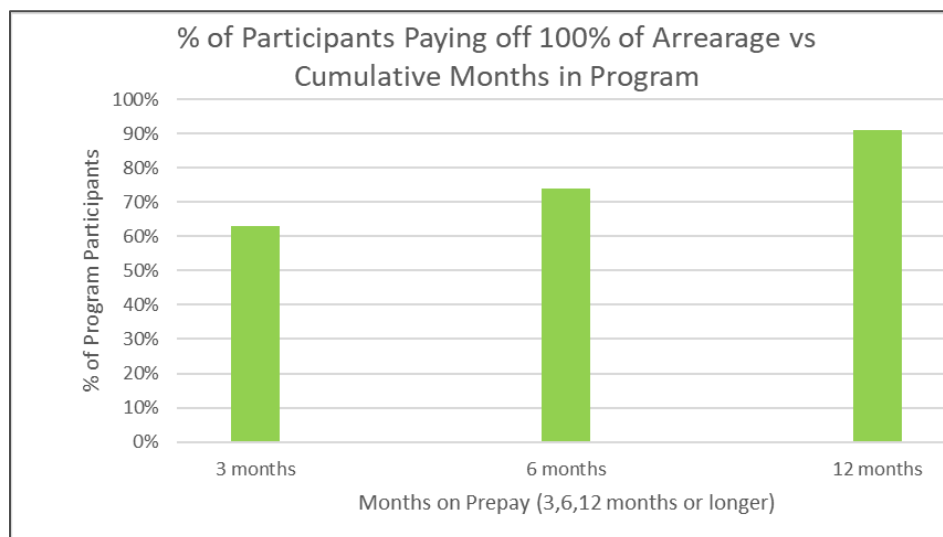
- 69% of customers stay on the program for 3 months or longer
- 80% of customers stay on the program for 6 months or longer
- 95% of customers stay on the program for 1 year or longer



2

Of Prepay Program Participants that pay off 100% of arrearage balance over time,

- 63% of customers that stay on the program for 3 months or longer
- 74% of customers that stay on the program for 6 months or longer
- 91% of customers that stay on the program for 1 year or longer



STUDY C



Consumers Energy: 38% impact on bad debt write off

Bad Debt - Benefit vs. Cost

- Pay My Way**
 - Unit costs to recover \$60 of bad debt over 12 months
- Post Pay**
 - Average unit cost per customer is \$12.32 per dunning incident:
 - \$1.8M annual cost
 - \$48M in arrears collected

| Pay My Way Costs - Annual | Customers Enrolled | Annual Cost per Customer | Monthly Cost Per Customer | Projected total debt recovered |
|---------------------------|--------------------|--------------------------|---------------------------|--------------------------------|
| \$ 987,500 | 5,000 | \$ 197.50 | \$ 16.46 | \$ 300,000 |
| \$ 987,500 | 25,000 | \$ 39.50 | \$ 3.29 | \$ 1,500,000 |
| \$ 987,500 | 50,000 | \$ 19.75 | \$ 1.65 | \$ 3,000,000 |
| \$ 987,500 | 100,000 | \$ 9.88 | \$ 0.82 | \$ 6,000,000 |

Spend \$1M to collect \$6M *Spend \$1.8M to collect \$48M*

ADDITIONAL FACTS



JEA: Recovered \$2 million in bad debt since January 2014 until October 2016, 4x what was projected since January 2014. Have reduced write offs by 29 percent as projected. Annual cash flow improvement is \$27.65 per customer.



Memphis Light Gas and Water: \$266 = estimated dollars saved per customer in bad debt write-offs.



Public Service of Oklahoma: We have seen a \$3 million dollar in reduction in bad debt since 2016 which is at least partly due to prepay. \$73 = estimated dollars saved per customer in bad debt write-offs.



Oklahoma Electric Co-Op (OEC): Significant impact on bad debt. OEC's gross bad debt during the past 5 years has ranged between .08% -- .12% of revenue which is lower than other cooperatives in Oklahoma and nation-wide that do not offer prepaid service. OEC's post-paid disconnects are 1/3 of what they were prior to offering prepaid service.



Clinton Utilities Board: Net write-offs dropped from \$239,000 five-year- average to \$44,000 five-year-average.



Duke Energy: 96% of prepay customers who entered the program with a deferred balance (debt) ultimately paid off their arrears on average within 1 month (with an average deferred balance \$48.96) \$270 = average dollars saved in bad debt write-offs per account.

Duke Energy Payments & Deferred Balances

Payment Summary

| Total - 6/1/15 - Present | | Total - Last 30 days |
|---|--------------|----------------------|
| Total Customers Who Made a Payment | 1192 | 872 |
| Total Payments Made (Count) | 15,993 | 3,059 |
| Total Payments | \$642,444.57 | \$130,844.57 |
| Average Number of Payments per Customer while participating | 13 | 3 |
| Average Dollars per Payment Amount Applied to Deferred | \$40.17 | \$42.77 |
| Remaining Deferred Amount | \$69,302.53 | \$14,363.83 |
| % of Deferred Amount Paid | | \$15,078.92 82.1% |

UTILITY CUSTOMER ARE HIGHLY SATISFIED



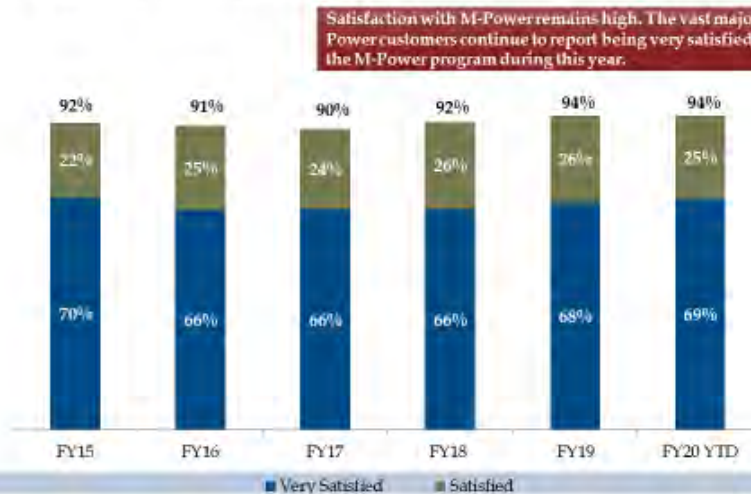
Duke Energy: In Duke Energy's report to the Public Service Commission of South Carolina, half of the pilot participants surveyed gave the top score of "10" regarding their customer satisfaction with the program. In all, over two-thirds of the participants gave the prepay program a top-3 box response regarding customer satisfaction.



Salt River Project: M-Power Program

Satisfaction with M-Power Program

-Fiscal Year

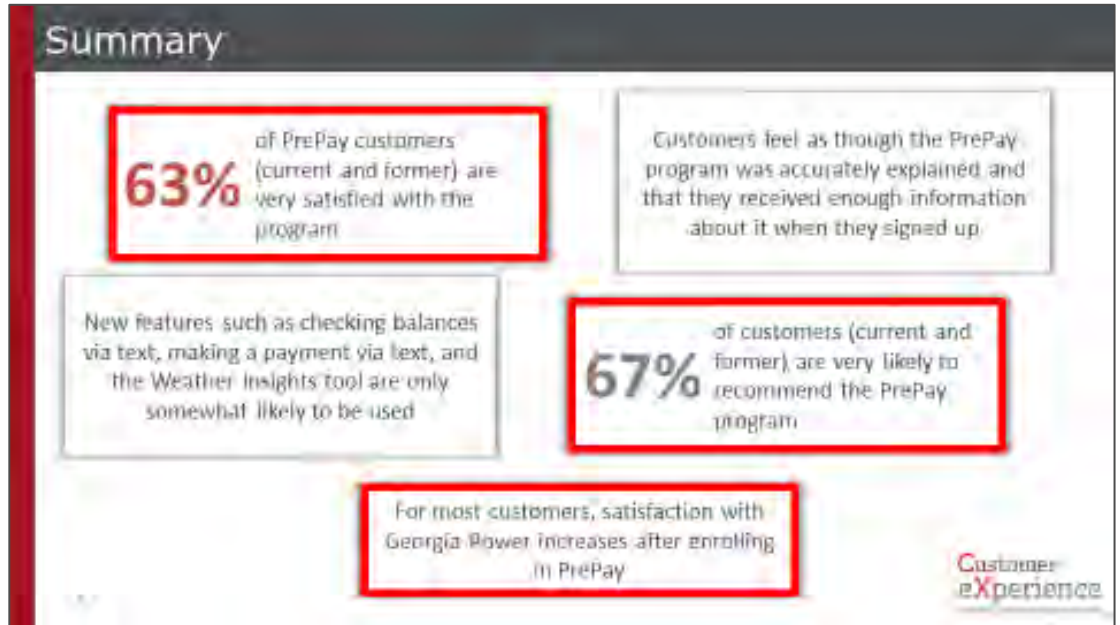


Satisfaction with M-Power remains high. The vast majority (94%) of M-Power customers continue to report being very satisfied/satisfied with the M-Power program during this year.



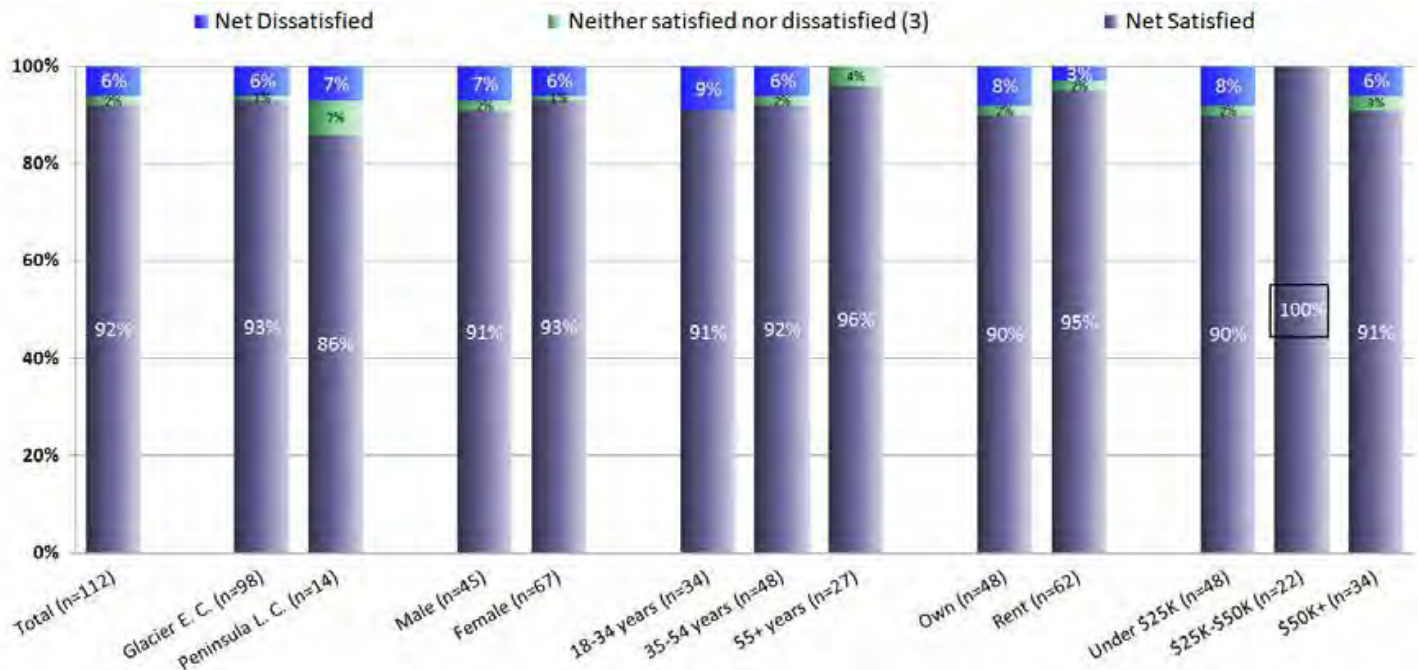
SRP Confidential

23. Overall, how satisfied are you with the M-Power program?



DEFG LLC Study: Prepay and Customer Satisfaction – Pacific Northwest

- 92 Percent of Customers Surveyed Satisfied with Prepay Energy



For more information
please contact:

Jamie Wimberly, CEO
jwimberly@defgllc.com

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October 17, 2014

Ms. Susan Corbin
Service Quality Division
Michigan Public Service Commission
4300 W Saginaw Hwy
Lansing, MI 48917

Re: MPSC Case No. U-16457 – 2014 Annual Pre-Pay Pilot Program Report

Dear Ms. Corbin:

Attached please find DTE Electric Company's 2014 Annual Pre-Pay Pilot Program Annual Report as required by the Michigan Public Service Commission in Case No. U-16457.

Sincerely,

Philip W. Dennis

Philip W. Dennis
Manager, Regulatory Economics

Digitally signed by Philip W. Dennis
DN: cn=Philip W. Dennis, o=Regulatory
Affairs, ou=DTE Energy - Regulatory Affairs,
email=dennisp@dteenergy.com, c=US
Date: 2014.10.17 15:38:20 -04'00'

Cc: mpscreports@michigan.gov

DTE Electric Company
Pre-Pay Pilot (Pay As You Go) Program – 2014 Annual Report
Case Number U-16457
October 17, 2014

The Order in Case No. U-16457, dated September 10, 2013, required DTE Electric Company (DTE Electric), formerly The Detroit Edison Company, to file an annual report and evaluation summarizing the information in the monthly reports and including additional information on changes in energy consumption by participants, percentage of low-income customers participating in the programs, other types of customers or customer sectors participating in pre-pay, changes in uncollectibles resulting from the program, customer satisfaction, and other relevant information.

The September 10, 2013 Order required DTE Electric to provide monthly reports that include the following information:

- Total number of customers currently enrolled in the SmartCurrents program, subdivided into number of customers receiving flat-rate pre-pay service and number of customers in the Dynamic Peak Pricing pre-pay program, further subdivided by customer class.
- Number of new enrollments in each program that month.
- Number of low-balance alerts sent that month.
- Number of customers shut off that month and the number of customers restored.
- Number of customers that dropped out of the program and why, if known.
- Total number of senior citizen and low-income customers enrolled in the programs.
- A summary of participant feedback, positive and negative, received about the SmartCurrents program during that month.
- Adjustments made to the program, if applicable.

The following is DTE Electric’s Annual Report on the Pre-Pay (Pay As You Go) pilot program. The Annual Report for 2014 covers the 12 month period from October 2013 through September 2014.

DTE Electric Pre-Pay Pilot (Pay As You Go) Program Summary of Participation Through September 30, 2014

| September, 2014 | Annual Report | Total Program Participation | | |
|---------------------------------------|---------------|-----------------------------|-----------|------------|
| | | This Month | This Year | Cumulative |
| Residential Class | | | | |
| Customers Enrolled Residential Rate | | 1 | 195 | 121 |
| Customers Unenrolled Residential Rate | | 5 | 402 | 498 |
| Customers Enrolled DPP Rate | | 0 | 0 | 2 |
| Customers Unenrolled DPP Rate | | 0 | 0 | 0 |
| Customers Enrolled Total | | 1 | 195 | 123 |
| Customers Unenrolled Total | | 5 | 402 | 498 |

| Active Customer Breakdown | This Month | This Year | Cumulative |
|---------------------------|------------|-----------|------------|
| - Senior | 0 | 0 | 0 |
| - Low Income | 0 | 0 | 0 |
| - Senior & Low Income | 0 | 0 | 0 |
| - All Others | 1 | 195 | 123 |

| | Monthly Alerts Sent * | | | YTD Alerts Sent * | | |
|-----------------------|-----------------------|---------------|---------|-------------------|---------------|---------|
| | 10 Day | Other Balance | Shutoff | 10 Day | Other Balance | Shutoff |
| - Senior | 0 | 0 | 0 | 0 | 0 | 0 |
| - Low Income | 0 | 0 | 0 | 0 | 0 | 0 |
| - Senior & Low Income | 0 | 0 | 0 | 0 | 0 | 0 |
| - All Others | 40 | 31 | 20 | 830 | 607 | 445 |
| TOTAL | 40 | 31 | 20 | 830 | 607 | 445 |

| | Monthly Shutoff/Restores | | YTD Shutoff/Restores | |
|-----------------------|--------------------------|----------|----------------------|----------|
| | Shutoffs | Restores | Shutoffs | Restores |
| - Senior | 0 | 0 | 0 | 0 |
| - Low Income | 0 | 0 | 0 | 0 |
| - Senior & Low Income | 0 | 0 | 0 | 0 |
| - All Others | 0 | 0 | 0 | 0 |
| TOTAL | 0 | 0 | 0 | 0 |

* 10 Day - Customer balance has an estimated 10 days usage remaining
 Other Balance - Optional days and dollars balance alerts chosen by customer
 Shutoff - Zero dollars/days balance remaining

Note: No non-residential customers are currently participating on the program.

Summary of Monthly Participant Feedback

The following represents direct feedback received from customers over the course of the past twelve months as summarized by Pay As You Go Customer Representative(s).

Positive Program Participant Feedback:

- Customers like the program to help them budget their electric bill based on the balance and usage notifications provided.
- Customers also like the program because of the online tool “My Energy Analyzer”. This allows the customer to check their usage and provides recommendations on energy savings tips.

- Customers feel they have control over their energy usage by being on the program.
- Customers like the alert notifications that align with the website to provide them with regular updates regarding their usage, costs. It helps them to identify where their energy is being used most in order for them to help better manage it.
- Customers felt they had a sense of control by providing them with information that they couldn't obtain outside of being in this program.
- Customers felt that there was little risk to enrolling and being in the program because they could opt out at any time.
- Customers indicated that they understand the program and it works well for them.
- The ability to have control and a better understanding of how much energy they are using helps them better manage their usage.
- Customers indicated that they are receiving their alert notifications which are informative and helpful.
- Customers indicated that they like the program because of the alerts notifications they receive, it helps them to know when they need to make a payment towards their account.
- Customers find the website tools provided such as the Energy Analyzer tool and the "Pay As You Go Status" online information helpful and informative.
- Customers find the website enhancements have made it much easier for them to navigate and obtain information.
- Customers find additional alert notifications implemented valuable because it provides updates regarding their usage and cost.
- Customers find the online tools valuable because it provides a visual aid (graphs, etc.) with recommendations on ways to better manage and reduce their usage.
- Customers find the program to be easy to use, convenient, flexible with payments, and offers good proactive communications through channels such as online, email and text alert notifications.
- Customers on the program feel that DTE Energy is helping them save money on their energy bills.
- Customers feel they have more control over their usage and can budget their bill more effectively on this program.
- Customers appreciate the personalized customer outreach we give in the following areas: provide balance and usage information and additional cost efficient ways to manager their energy consumption.
- Customers are actively engaged in the program.

Negative Program Participant Feedback:

- Some customers don't understand how the program works or the benefits.
- Customer called the 800# and was transferred several times before getting the Pay As You Go Call Center.
- Some customers have cancelled from the program because they moved.
- Customers need on-going customer care to help them better understand how the payment and billing process works in order for them to change their behavior and be successful on the program.
- The technology needs to be easy to use, reliable and consistent through all channels to improve their experience while being on the program (i.e., Customer Care, Online, IVR, etc.).
- Some customers didn't understand how the billing and payment process worked as it relates to their alert and eBill notifications.

- During the holiday season, many customers didn't have time to check their email alert notifications causing them to be unaware of how much energy they had used and how much they needed to pay.
- Due to the extreme cold weather conditions, customers have seen an increase in their energy usage and costs. Therefore, they are unable to maintain a credit balance and some have requested to be removed from the pilot.
- Customers helped us identify gaps in our process with providing consistent, reliable, balance information through our communication channels.
- Some customers switched to a different payment plan that would be more cost efficient due to higher electric bills in winter months.
- Regardless of the weather, some customers have unenrolled from the program due to the inability of maintaining a credit balance.
- Some customers didn't understand the benefits of the program and feel that their bills were higher since they have been on the program.
- Customers have indicated that they have to contact us through the Call Center to obtain their balance information if they no longer have a credit on their account and receive conflicting information when viewing information on-line. Therefore, customers are confused about the actual amount they need to pay.
- Some customers are paying only their statement amount because they did not understand how the program works.
- Some customers have unenrolled from the program to enroll in other payment programs which allows them to pay monthly.
- Some customers feel they are paying more frequently by being on the program.
- Some customers prefer to pay monthly rather than maintaining a credit balance due to financial difficulties and higher bills.
- Some customers were not receiving their alert notifications due to a system issue. As a result, they were unaware of their balance and payment information.
- Some customers prefer to pay monthly with their payment automatically debited from their account versus making additional payments in the Pre-Pay pilot.

Adjustments Made to the Program:

- DTE Electric is in the process of transitioning the program to an in-house Pay As You Go system that will allow enrollment, un-enrollment, maintenance and customer service through its Customer Service department. The design, development, and testing of the system enhancements has been completed. The new in-house Pay As You Go system has been deployed in September. A training package has been created and is the next step in this process to roll out to Customer Representatives (CR).
- An internal communication plan was created and distributed in September to the in-house, vendors, and key stakeholders regarding the deployment of this new system. DTE Electric will continue to collaborate, assist and actively engage our Customer Service business unit with the transitioning process.
- Implemented a redesigned Pay As You Go page on the dteenergy.com website to help better educate the customers about the program and help reduce calls to the call center for assistance.

- Updated CR screens to display program contact information and new call center phone number.
- Implemented in-house follow-up calling campaign to obtain voice of the customer (VOC) and their experience while being on the program.
- Improved alert notification content that customers receive regarding their usage and costs. This enhancement has helped reduced customer concerns due to the negative communication content that was distributed to them in the past.
- Identified root cause of multiple contacts made to the customer through our vendor's auto dialer system, corrected error and alleviated the multiple contacts made to eligible customers.
- DTE Electric is in the process of improving its alert notification content by implementing a pilot to migrate to a different vendor.
- An alert notification enhancement was completed for customers who no longer have a credit balance. Prior to this enhancement, the customers would no longer receive alert notifications if their account balance reached zero until they made a payment to bring it to a credit balance again. Based on direct VOC feedback, these impacted customers will continue to receive alert notifications twice a week until their account has a credit balance. A monitoring and tracking process will be utilized to measure the impact (positive/negative) of this migration. DTE Electric is testing this migration as a pilot as part of its effort to enhance overall communication. Regression testing is underway to ensure accuracy and timeliness of the alert notifications.
- A new communication package was distributed to existing customers. The communication package has a new look and feel. Content and graphics that explain the program in detail to help set customers expectations and improve their experience.
- The new communications package was distributed to all customers on the program to better educate them on how the program works. Follow up outbound calling was utilized to obtain the VOC feedback from the new communication package. Customers have confirmed that they received the new communications packet and found the information to be helpful. It provides them with a clearer understanding of how the program works and the actions required for the customer in order to be successful while on the program.
- DTE Energy made several online enhancements (i.e. the look, feel, content, and navigation) to help improve the customer's experience. Some of these improvements included: streamlining the process to obtain account information, consolidating multiple pages and steps into one page that provides the customer with all of their "Pay As You Go" account information on one page and extending the account information from 3 months to 12 months of usage, balance and payment history.
- As a result of implementing an enhanced alert notification and communication package, customers are actively participating in the program by maintaining a credit balance and utilizing the tools available to them through multiple channels.
- DTE Electric has seen a reduction in the number of customers that are not maintaining a credit balance and their amount owing.
- IT process improvements are in place to avoid a repeat of the notification issues. Part of this involves moving to a different notification vendor in the future.

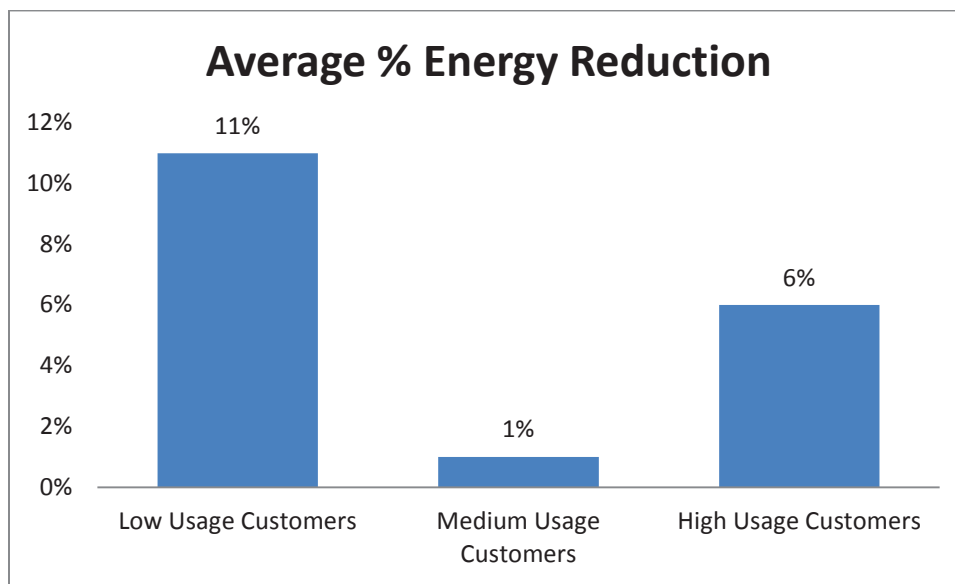
Additional Information on Changes in Energy Consumption by Participants

DTE Electric analyzed potential energy consumption changes by the participants in the Pay As You Go Program. A participant list was received and consisted of 129 customers that were considered active in the program as of August 29, 2014. Typically, in order to perform a valid load analysis, DTE Electric needs to obtain at least one year of consumption data from customers at their current location (“pre-enrollment data”) before they enrolled on the Pay As You Go Program. This would allow for a year over year comparison between the normal billing process and the Pay As You Go process. From the list of 129 customers, 24 customers had sufficient pre-enrollment data and were enrolled on the program for at least 11 months. One customer from the list of 24 had to be removed as the customer was considered an outlier due to an irregular consumption pattern. Therefore, DTE Electric used 23 customers who were deemed to have sufficient data for the analysis.

To analyze the data, each customer’s monthly bills before they enrolled on the Pay As You Go program were compared to their monthly bills immediately following their initial enrollment into the program. The data was then aggregated together by month and totaled, regardless of the data year. The kWh consumption was temperature normalized using heating degree days and cooling degree days which removed the weather variable from the energy usage. While there could have been additional factors that influence kWh consumption such as changes in household occupancy or new efficient appliances, for this analysis it was assumed that only influence was weather.

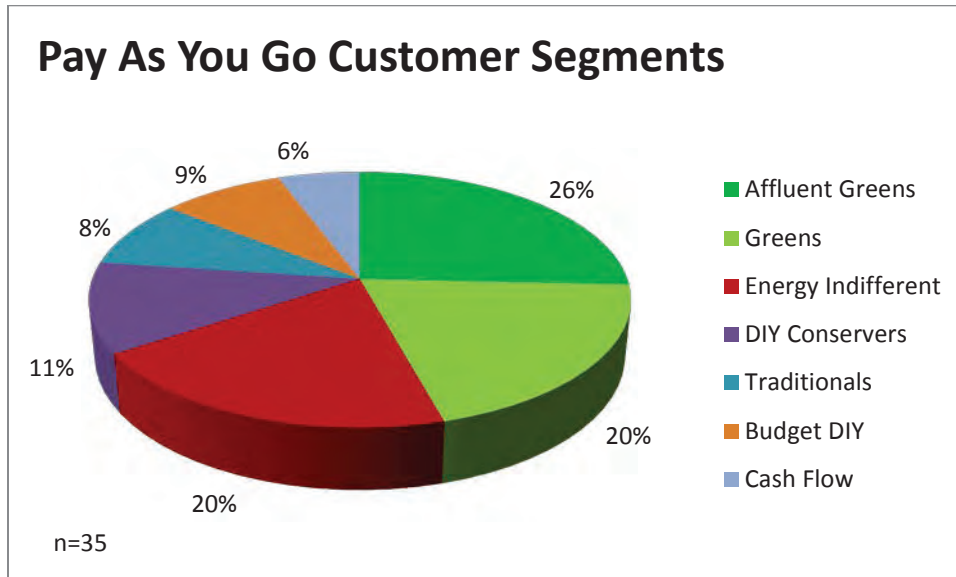
Overall, the 23 customers analyzed reduced their monthly energy consumption by an average of 6%. Further breaking down the results and grouping the 23 customers based on their average monthly pretreatment usage, customers with low usage (<450 kWh per month) reduced their consumption by an average of 11%. Customers with medium usage (450 kWh – 900 kWh per month) reduced their load by 1%. The average DTE Electric customer falls within the medium usage range. Customers with high usage (>900 kWh per month) were able to reduce their load by 6%. This data can be seen in the graph below.

While the 23 customers who made up the analysis do not make up a statistically valid sample, the customers who were analyzed show, on average, varying levels of reduced energy consumption. The analysis seems to indicate that customers who are considered low energy users benefit the most in terms of energy reduction from a Pay As You Go Program.



Customer Sectors Participating in Pre-Pay

As of September 30th, of the 123 active Residential customers on the program, 35 or 28% matched with secondary customer research segment data. The following graphic shows the percentage of customers identified in the respective customer research segments.



Of the Pay As You Go program customers that were matched with customers segments, 46% were identified in a Green segment: 26% in the Affluent Greens segment and 20% in the Greens segment. Both of these segments tend to be early adopters, enjoy learning and trying new things, and are brand loyal internet shoppers. They are willing to spend more for energy efficient products, say they are likely to participate in DTE EO programs and use Smart Meters to save energy. For additional information on all the segments, see separate attachment "Residential Segmentation" summary descriptions of each of the DTE Energy segments.

Changes in Uncollectibles Resulting from the Program

To date there have been no changes in DTE Energy uncollectibles resulting from the program.

Customer Satisfaction

Residential Customer Attitude Survey (RCAS) / Pay As You Go Pilot Program Survey Methodology

A total of 102 telephone interviews were conducted among Residential Pay As You Go Program participants. The sample of the Pay As You Go Program participants (338 records) was provided by DTE Energy, and the interviewing was conducted from the Market Strategies Research Operations Center from March 4 to March 24, 2014.

The Pay As You Go data is compared to the Q1 2014 Residential Customer Satisfaction data, where applicable. The 1,000 telephone interviews were conducted among a random sample of Residential customers from January 20 to March 23, 2014.

For both customer groups, landline and cell phone numbers were used to contact customers for survey participation.

Market Strategies identified the Pay As You Go survey respondent as the head of the household or spouse responsible for paying the energy bills, and also has knowledge of program participation.

| Q1 2014 | Sample Size (n) | Sample Error |
|-----------------------------|-----------------|--------------|
| RCAS* Customer Group | | |
| Pay As You Go | 102 | +/-10 |
| Q1 Base | 1000 | +/-3 |

*Residential Customer Attitude Survey (RCAS)

Background

The Pay As You Go program is a free voluntary program that is currently being tested with a select group of DTE Energy customers who have an AMI Meter installed at their residence. This program is designed to help them better manage their energy usage and to help them save money. Participants purchase electricity in advance by adding credits to their account. As their account credits get low, DTE Energy will notify customers by email that they are at risk of loss of service. If service is lost due to insufficient funds, DTE Energy will not charge a reconnection fee once credits have been added to the account.

The Pay As You Go respondents were asked a subset of questions from the Customer Satisfaction survey along with satisfaction with the program:

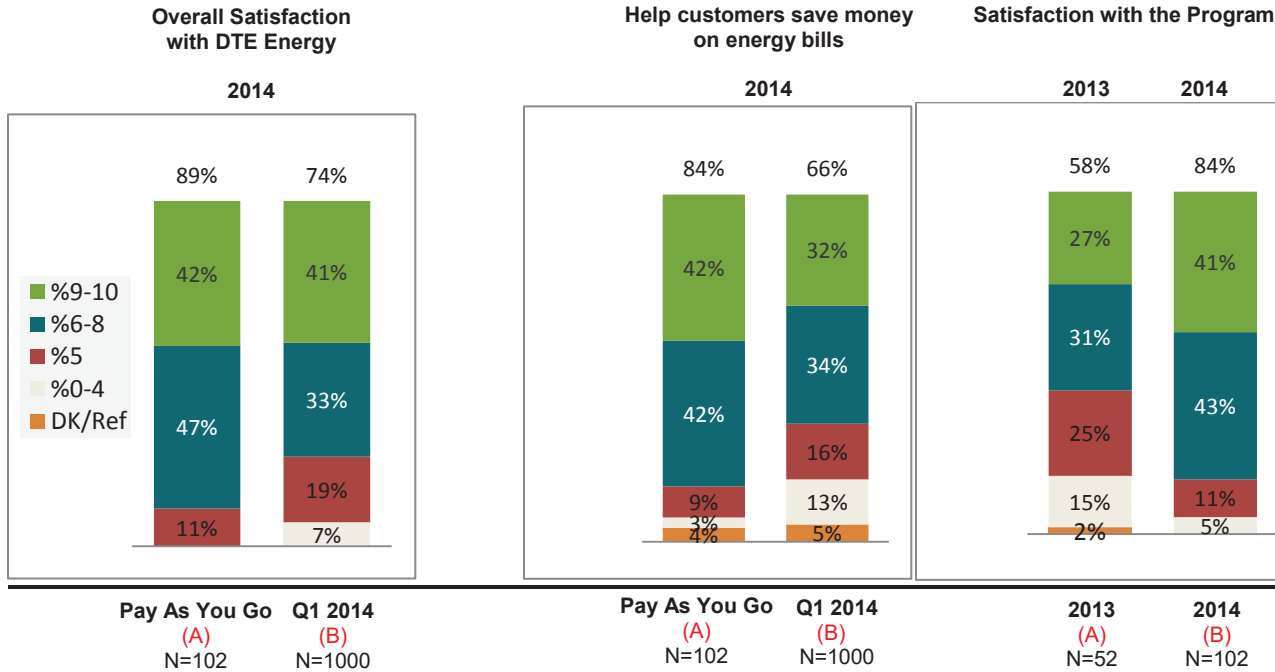
- Overall Satisfaction with DTE Energy
- Help customers save money on energy bills
- Satisfaction with the Pay As You Go Program

Overall DTE Measures (Q1 RCAS Customer Satisfaction Data)

In 2014, positive response for “Overall Satisfaction with DTE Energy” is a significant 15 points higher for Pay As You Go participants compared to base respondents (89% vs. 74%).

“Helping customers save money on energy bills” is a significant 18 points higher among program participants compared to the base respondents (84% vs. 66%).

“Overall satisfaction with the program” increased a significant 26 points (58% to 84%) from 2013 to 2014.



AB indicates significant differences between Pay As You Go Participants and Base Cases

AB indicates significant differences between time periods

Colors in bar graphs represent customer ratings on a 10 point scale, i.e., %9-10, %6-8, etc.

Other Relevant Information

As of September 30, 2014 the 123 Pay As You Go customers reflected a wide variety of geographic communities (35 cities/townships) across the DTE Electric service territory. Three groups of communities were identified based on a ranking of highest percent of customers enrolled in the program. The following first group are the Top 10 cities that represent 65.3% of customers on the program: Ann Arbor (14%), Farmington Hills (9.7%), Novi (6.5%), Rochester Hills (6.5%), Auburn Hills (5.7%), Royal Oak (5.7%), West Bloomfield (4.9%), and Oak Park, Pontiac, and Troy each represented 4.1% of customer enrollments.

The second group of 10 communities represents 22.5% of customers on the program: Wixom (4.1%), Bloomfield Hills (3.2%), Farmington (3.2%), Waterford (2.4%), and Commerce Township, Ferndale, Lake Orion, Madison Heights, Northville, and Southfield each represent 1.6% of customer enrollments.

The third group of 15 communities represents 12.2% of customers on the program: Belleville, Beverly Hills, Carleton, Clarkston, Grosse Ile, Hazel Park, Holly, Leonard, Livonia, Milford, Monroe, Newport, Rochester, South Lyon, and Sylvan Lake each represent .81% of customers on the program.

Pre-Pay Program Summary

The Pre-Pay (Pay As You Go) Program is a new voluntary program that gives residential customers quick access to information regarding their energy consumption and greater control over the frequency and timing of their payments. The program is designed to give customers the option to prepay for their electric service. The idea is similar to prepaid cell phones except it is for electricity use. The voluntary program allows customers to make payments of different sizes and at different times in advance of service rather than receiving a bill at the end of the

monthly billing period. The prepayment option allows customers access to their billing information on a more frequent basis using their preferred communication channel.

DTE Electric currently has 123 residential customers on the Pay As You Go Program. Customers like the program to help budget their bill based on balance and usage notifications provided and feel they have control over their energy usage by being on the program. Customers need on-going education to help them understand how the payment and billing works in order for them to change their behavior and be successful on the program. Customer drop off issues occur when contact is made to those customers who were not behaving like true pre-pay customers, i.e., only paying on a monthly basis, and a customer representative would have a conversation with them that the program may not be right for them. Customer Service will continue to monitor customers who have a debit balance to ensure customers that remain on the program maintain a credit balance. DTE Electric is in the process of transitioning the program to an in-house Pay As You Go system that will allow enrollment, un-enrollment, maintenance and customer service through its Customer Service department. The design, development, and testing of the system enhancements has been completed. A training package has been created and is the next step in this process to roll out to Customer Representatives.

Customers on the program were analyzed for energy consumption, customer sectors participating, customer satisfaction, and geographic community participation. In terms of changes in energy consumption by participants, while customers who made up the analysis do not make up a statistically valid sample, customers with low usage (<450 kWh per month) reduced their consumption by an average of 11%. Customers with medium usage (450 kWh – 900 kWh per month) reduced their load by 1%. The average DTE customer falls within the medium usage range. Customers with high usage (>900 kWh per month) were able to reduce their load by 6%. Customers who were analyzed show, on average, varying levels of reduced energy consumption. The analysis seems to indicate that customers who are considered low energy users benefit the most in terms of energy reduction from a Pay As You Go Program. In terms of Customer Satisfaction, in 2014, positive response for “Overall Satisfaction with DTE Energy” is a significant 15 points higher for Pay As You Go participants compared to base respondents (89% vs. 74%). “Helping customers save money on energy bills” is a significant 18 points higher among program participants compared to the base respondents (84% vs. 66%). “Overall satisfaction with the program” increased a significant 26 points (58% to 84%) from 2013 to 2014. Finally, the Pay As You Go customers reflected a wide variety of geographic communities (35 cities/townships) across the DTE Electric service territory. The Top 10 cities that represent 65.3% of customers on the program are: Ann Arbor (14%), Farmington Hills (9.7%), Novi (6.5%), Rochester Hills (6.5%), Auburn Hills (5.7%), Royal Oak (5.7%), West Bloomfield (4.9%), and Oak Park, Pontiac, and Troy each represented 4.1% of customer enrollments.

DTE Energy®



Residential Segmentation

**Customer Research & Information
October 29, 2010 (Updated 8/2/2011)**



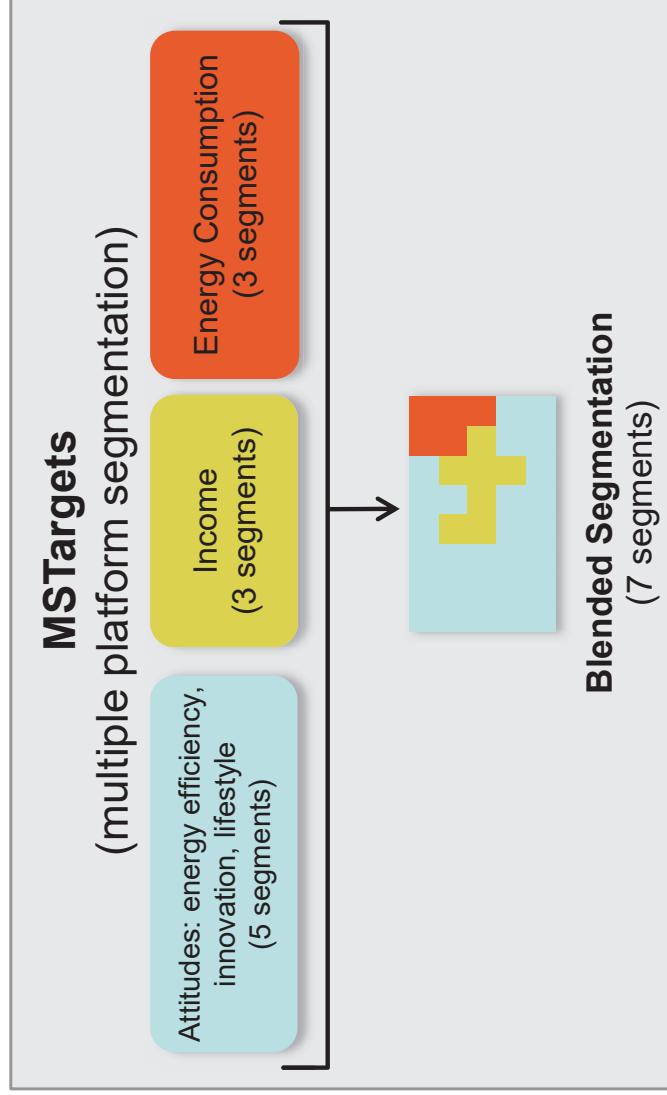
DTE Business Objectives

- Contribute to the success of residential energy optimization programs by enabling efficient targeting of customer segments with high likelihood to participate.
- Support both EO program design and communication strategies: Profile customer segments in terms of relevant characteristics and motivations, so that EO programs - and communications about them - can be customized to appeal strongly to specific segments.
- Evaluate customer satisfaction by segment, and develop strategies to increase satisfaction through targeted energy optimization programs/services and other means.
- Develop information and insights that help in marketing other DTE programs, services and technologies, for example:
 - Data on environmental views may be helpful in developing marketing strategies for renewable energy programs
 - Data on innovation and technology adoption may be useful for AMI/Smart Meter strategies

Segment Development



- The goal of segmentation analysis of DTE customers was to identify homogenous groups of individuals who are maximally different from each other group on multiple dimensions.
- Working with the DTE project team, these dimensions were determined to be
 - Attitudes about energy efficiency, attitudes toward innovation and new product adoption, as well as attitudes that measured lifestyles
 - Demographics: Household income as reported by customers
 - Behaviors: Energy consumption based on DTE records



Affluent Greens

Segment Summary / DTE Opportunities

DTE Energy®



Key Characteristics

- About 253,000 customers, or 11%
- Highest income, highest education segment
- Most are married with kids or empty nesters
- More likely than most to have adopted some energy efficiency measures already
- 49% live in the North-South suburban region; 23% in Wayne County; few in Detroit
- About half of high income African Americans are in this segment

Attitudes, Wants and Needs

- Express average satisfaction with DE; high satisfaction with MichCon
- Feel that they are knowledgeable about conserving energy
- Tend to be early adopters; enjoy learning about and trying new things
- Brand loyal Internet shoppers, they do careful research before making a purchase
- Will spend more for environmentally friendly products
- Will spend more for energy efficient products and the Energy Star label
- Say they are **likely to participate** in DTE EO programs and use Smart Meters to save energy

Energy Indifferent Segment Summary / DTE Opportunities



Key Characteristics

- About 329,000 customers, or 14%
- Second highest income segment
- Most are married with kids or empty nesters
- Average likelihood to have adopted some energy efficiency measures already
- Half live in the North-South suburban region; 16% in Wayne County
- About half of high income African Americans are in this segment

Attitudes, Wants and Needs

- Express approximately average satisfaction with DE and MichCon
- Feel neither more nor less knowledgeable about conserving energy than the average customer
- Tend *not* to be early adopters and to like life to stay the same from week to week
- Show about average willingness to spend more for energy efficient products or the Energy Star label
- **About average in their likelihood to participate** in DTE's EO programs, but above average in saying they will use Smart Meters to save energy

DIY Conservers Segment Summary / DTE Opportunities

DTE Energy®



Key Characteristics

- About 361,000 customers, or 16%
- Moderate income, slightly below average education
- Most are married with kids or empty nesters
- More likely than most to have adopted some energy efficiency measures already
- 35% live in the North-South suburban region; 20% in Wayne County; 10% in Detroit
- Nearly half of moderate income African Americans are in this segment

Attitudes, Wants and Needs

- Express slightly below average satisfaction with DE; average satisfaction with MichCon
- Think that conserving energy is important and that they know a lot about it
- DIY oriented
- Tend to be late adopters
- Budget shoppers; may be willing to sacrifice comfort to save money
- They say they are **about average in likelihood to participate** in EO programs and slightly above average in likelihood to use Smart Meters to save energy



Key Characteristics

- About 357,000 customers, or 16%.
- Moderate income, lower than average education
- Oldest segment; almost four in ten are retired
- Distributed across all life stages, but few are married with children in the HH
- Relatively few have adopted energy efficiency measures already
- Proportionally distributed across DTE geography

Attitudes, Wants and Needs

- Slightly above average in satisfaction with DE and MichCon
- Feel that being comfortable in their home is a top priority, more than saving energy
- Tend to be late adopters and like their lives to stay the same week to week
- Do not feel knowledgeable about conserving energy, and find it difficult to understand the payback of energy efficiency
- Say they are **the least likely segment to participate** in DTE EO programs or to use Smart Meters to conserve energy

Greens Segment Summary / DTE Opportunities



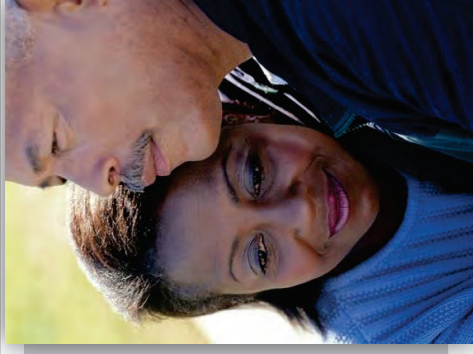
Key Characteristics

- About 424,000 customers, or 18%
- Lower-moderate income, relatively high education segment
- Distributed across all life stages, although an unusually high 13% are not married/no kids
- Slightly more likely than most to have adopted some energy efficiency measures already or say they intend to do so
- Youngest segment, nearly half under 45
- Proportionally distributed across DTE geography

Attitudes, Wants and Needs

- Express average satisfaction with DE and MichCon
- Greens are the segment most likely to self-identify as environmentalists
- Feel they know a lot about conserving energy
- Tend to be early adopters; enjoy learning about and trying new things
- Like to keep up with trends and be fashionable
- Brand loyal Internet shoppers, they do careful research before making a purchase
- Willing to spend more for energy efficient products and the Energy Star label
- Greens say they are **likely to participate** in DTE EO programs and use Smart Meters to save energy

Cash Flow Segment Summary / DTE Opportunities



Key Characteristics

- About 218,000 customers, or 10%.
- Lower income, lower than average education, high unemployment
- Distributed across all family oriented and older life stages; high proportion are “not married, have kids” (17%)
- High percentage of females, 62%
- Lower than average likelihood to have adopted some energy efficiency measures already
- Second largest segment in the City of Detroit

Attitudes, Wants and Needs

- The lowest segment in customer satisfaction - well below average for both DE and MichCon
- Feel that being comfortable in their home is a priority, more than saving energy
- Do not feel knowledgeable about conserving energy, and find it difficult to understand the payback of energy efficiency
- Like rebates and extended warranties
- They say they are **about average in likelihood to participate** in EO programs and slightly below average in likelihood to use Smart Meters to save energy

Budget DIY Segment Summary / DTE Opportunities



Key Characteristics

- About 360,000 customers, or 16%.
- Lower income segment, low education, high unemployment
- Distributed across all family oriented and older life stages; high proportion are “not married, have kids” (17%)
- Highest percentage of females for any segment , 64%
- Average proportion have adopted some energy efficiency measures already
- 35% live in the North-South suburban region; 24% in Wayne County; 10% in Detroit

Attitudes, Wants and Needs

- Slightly below average in satisfaction with DE and MichCon
- Tend to be late adopters; budget shoppers
- Believe it is important to save energy in the home
- May be willing to sacrifice comfort to save money
- DIY oriented
- Not willing to spend more for environmentally friendly products or the Energy Star label
- They say they are **slightly below average in likelihood to participate** in EO programs and in likelihood to use Smart Meters to save energy

DTE Electric Company
One Energy Plaza, 1650 WCB
Detroit, MI 48226-1279



Carlton D. Watson
(313) 235-6648
carlton.watson@dteenergy.com

January 7, 2022

Joel B. King
Assistant Attorney General
Special Litigation Division
6th Floor Williams Bldg.
525 W. Ottawa Street
Lansing, MI 48909

Re: In the matter of the Application of DTE ELECTRIC COMPANY for approval of a partial waiver of the Consumers Standards and Billing Practices for Electric Residential Service and approval of a Voluntary Prepay Billing Program
MPSC Case No. U-21087

Dear Mr. King:

Attached for electronic filing in the above-captioned matter is DTE Electric Company's Response to Michigan Attorney General and Citizen's Utility Board of Michigan's Third Discovery Request. Also is attached is a Proof of Service.

Very truly yours,

Carlton D.
Watson

Digitally signed by Carlton
D. Watson
Date: 2022.01.07 12:20:47
-05'00'

Carlton D. Watson

CDW/cdm
Attachments

cc: Service List

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-3.25
Respondent: M. Hatsios / Legal
Page: 1 of 1

Question: Please provide an itemization of all investments and O&M costs required to implement the proposed Prepay program, by year, through the fifth year.

Answer: DTE Electric objects for the reason that the request is unclear and unduly vague since the Company is unclear regarding the meaning of the phrase, "itemization of all investments." Subject to this objection, and without waiving this objection, the capital dollars to implement both phases of PrePay, and the associated request for capital recovery, are as shown in Exhibit A-12, Schedule B5.7.3 of witness Pizzuti's testimony in DTE Electric's Rate Case U-20836, which includes actual capital spent in 2021 and the forecasted project capital spend for 2022 and 2023.

Project implementation O&M spend began in 2020 and continues through 2023 as follows:

2020 - \$95,349
2021 - \$341,475
2022 - \$100,000
2023 - \$250,000

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-3.26
Respondent: M. Hatsios
Page: 1 of 1

Question: Will new customers be eligible to enroll in Prepay, provided they meet other eligibility requirements? If not, please explain why not.

Answer: Yes.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-3.26a
Respondent: M. Hatsios
Page: 1 of 1

Question: Will new customers be eligible to enroll in Prepay, provided they meet other eligibility requirements? If not, please explain why not.

a. If yes, how will the Company assess effectiveness of Prepay for these customers against the four program goals described by witness Hatsios (MJH-9: 11-17)?

Answer: For certain attributes (e.g. arrears impacts, energy reductions) this may not be possible given new customers have no prior history with DTE or at the site. However, where applicable, the Company would assess the effectiveness of the program in the same manner as it would for existing customers.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-3.26b
Respondent: M. Hatsios
Page: 1 of 1

Question: Will new customers be eligible to enroll in Prepay, provided they meet other eligibility requirements? If not, please explain why not.

b. If yes, how will the Company project usage and estimate prepayments for new customers who have no usage history?

Answer: The Company would use site history and continuously update the data on a rolling basis as the new customer creates their own history at the site.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-3.27
Respondent: M. Hatsios
Page: 1 of 1

Question: Please describe protections, if any, that Prepay affords tenants who reside with their landlord, when the landlord is the electric account holder and pays the electric bill.

Answer: Landlords are not eligible to enroll in PrePay and are restricted as such due to the requirement that the customer have only one premise/account.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-3.28a
Respondent: M. Hatsios
Page: 1 of 1

Question: Reference Table 1 (MJH 12:4), row titled “Enrolled in Non-Payment Programs (e.g., MIGP, HPP).”

a. In what sense are Michigan Green Power and Home Protection Program classified as “Non-Payment Programs”?

Answer: The Company is using the term “non-payment programs” to describe those voluntary programs for which customers agree to pay an incremental fee to participate in and receive the benefits of the program. Michigan Green Power and the Home Protection Program are two examples of these types of voluntary non-payment programs.

In contrast, in describing a “payment program,” the Company is referring to those programs in which a customer can enroll that allows them an alternative means to pay for their monthly usage – examples of a payment program would include payment plans, the winter protection plan, and budget wise billing.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-3.28b
Respondent: M. Hatsios
Page: 1 of 1

Question: Reference Table 1 (MJH 12:4), row titled “Enrolled in Non-Payment Programs (e.g., MIGP,HPP).”

b. Why should customers of these programs not be eligible to participate in Phase 1 of Prepay?

Answer: The Company assessed the complexity of allowing customers enrolled in these programs to also enroll in Prepay, and consistent with the other utility PrePay providers with which the Company consulted, it was decided that to simplify the solution and the customer experience it would be best to defer PrePay enrollment for customers participating in other non-payment programs to a subsequent phase of the implementation.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-3.29a
Respondent: M. Hatsios
Page: 1 of 1

Question: Please provide projected total change in total working capital per Prepay customer.

a. How much of that change per customer is attributable to the timing difference between receipt of Prepay and post-pay payments?

Answer: While PrePay is expected to positively impact working capital, the Company has not projected the expected change, which will depend on the number of enrollments and the mix of the segment of customers who choose to enroll. Any reductions in working capital realized as a result of customer participation in PrePay would be reflected in future rate case filings.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-3.29b
Respondent: M. Hatsios
Page: 1 of 1

Question: Please provide projected total change in total working capital per Prepay customer.

b. How much of that change per customer is attributable to reduced arrearages of Prepay customers compared to post-pay?

Answer: Please see my response to AGCUBDE-3.29a.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-3.29c
Respondent: M. Hatsios
Page: 1 of 1

Question: Please provide projected total change in total working capital per Prepay customer.

c. Please describe and quantify any changes in working capital per Prepay customer, compared to postpay customers, other than the two described above.

Answer: Please see my response to AGCUBDE-3.29a.

Attachments: None.

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of **DTE Electric**)
Company for the approval of a partial waiver of)
the Consumer Standards and Billing Practices for)
Electric Residential Service and approval of a)
Voluntary Prepay Billing Program.)

Case No. U-21087

PROOF OF SERVICE

CAITLIN MYERS states that on January 7, 2022, she served a copy of the DTE Electric Company's Response to Michigan Attorney General and Citizen's Utility Board of Michigan's Third Discovery Request in the abovecaptioned matter, via electronic mail upon the persons listed on the attached service list.

Caitlin D. Myers  Digitally signed by Caitlin D. Myers
Date: 2022.01.07 12:20:28 -05'00'

CAITLIN D. MYERS

MPSC Case No. U-21087

SERVICE LIST

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January 7, 2022

Joel B. King
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Special Litigation Division
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Re: In the matter of the Application of DTE ELECTRIC COMPANY for approval of a partial waiver of the Consumers Standards and Billing Practices for Electric Residential Service and approval of a Voluntary Prepay Billing Program
MPSC Case No. U-21087

Dear Mr. King:

Attached for electronic filing in the above-captioned matter is DTE Electric Company's Response to Michigan Attorney General and Citizen's Utility Board of Michigan's Second Discovery Request. Also is attached is a Proof of Service.

Very truly yours,

Carlton D.
Watson

Digitally signed by
Carlton D. Watson
Date: 2022.01.07 12:21:16
-05'00'

Carlton D. Watson

CDW/cdm
Attachments

cc: Service List

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.15a
Respondent: M. Hatsios
Page: 1 of 1

Question: In testimony, witness Hatsios states, “The protections provided by the billing rules for which the Company is requesting waivers, are necessary in the post-pay model to ensure customers are provided adequate opportunity to access funding, and if necessary enroll in a payment plan to avoid shutoff.” (MJH 29:2-6)

a. Is it the Company’s belief that it is not necessary or desirable to provide Prepay customers with similar opportunities to access funding? Why?

Answer: No, it is not the Company’s belief that PrePay customers should not have access to funding, and as stated in the Company’s testimony in the instant case, customers will have the opportunity to receive assistance dollars and have those dollars applied to their PrePay accounts.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.15b
Respondent: M. Hatsios
Page: 1 of 1

Question: In testimony, witness Hatsios states, “The protections provided by the billing rules for which the Company is requesting waivers, are necessary in the post-pay model to ensure customers are provided adequate opportunity to access funding, and if necessary enroll in a payment plan to avoid shutoff.” (MJH 29:2-6)

b. If so, how are Prepay customers differently situated from post-pay customers such that they do not need the same amount of time to access funding?

Answer: As described in the Company’s testimony in the instant case, PrePay customers are able to apply nominal amounts of dollars to the account to maintain a positive balance. For customers who might be seeking energy assistance, the ability to pay in amounts and at a frequency that works for them, could provide them time to apply for such assistance.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.15c
Respondent: M. Hatsios
Page: 1 of 1

Question: In testimony, witness Hatsios states, “The protections provided by the billing rules for which the Company is requesting waivers, are necessary in the post-pay model to ensure customers are provided adequate opportunity to access funding, and if necessary enroll in a payment plan to avoid shutoff.” (MJH 29:2-6)

c. Does the Company believe that providing Prepay customers with low-balance notifications at five, three, and one day(s) before shutoff ensures customers are provided adequate opportunity to enroll in a payment plan to avoid shutoff? Why?

Answer: Customers who voluntarily enroll in PrePay can unenroll at any time, and if they wish to revert to post-pay would be able to do so and at the same time enroll in a traditional payment plan if they meet the eligibility requirements.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.16a
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.120 (3) Billing Frequency; method of delivery. (MJH 24:16-19)

- a. Is the Company proposing that Prepay customers should not be entitled to receive a bill at any time before their account balance reaches zero and their power is shut off?

Answer: As stated in the Company's testimony in the instant case, PrePay Customers will be provided a monthly summary statement of their account activity. Additionally, customers can check their account balance daily and view their account history by logging into their PrePay account.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.16b
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.120 (3) Billing Frequency; method of delivery. (MJH 24:16-19)

- b. If that is not the Company's proposal, would the Company support new Rules language specifying what information a Prepay customer should receive and how far in advance of shutoff that information should be mailed, transmitted, or delivered? If so, what language would the Company propose?

Answer: Please see my response to AGCUBDE-2.16a.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.16c
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.120 (3) Billing Frequency; method of delivery. (MJH 24:16-19)

c. Does the Company believe it could comply with this Rule by sending all Prepay customers a bill at least 21 days in advance of their projected zero-balance date? If not, why? If so, why is it necessary, desirable and fair to waive this rule?

Answer: No. The concept of a monthly bill with a due date does not exist for prepaid utility services. In lieu of a monthly bill, Customers who voluntarily enroll in PrePay are agreeing to receive low-balance alerts and daily access to their account balance as a method of monitoring the number of days of credit remaining, allowing them to make informed decisions about how much they choose to add to the account based on their needs.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.17a
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.129 (4): “When a customer receives a past-due notice from the utility, the utility shall provide the customer access to information about energy assistance programs....” (MJH 24-25:21-2)

a. Under what circumstances could a Prepay customer have a past-due balance?

Answer: The concept of a past-due balance does not exist for prepaid utility services as there is no monthly bill or associated payment due date. As described in the Company’s testimony in the instant case, customers can fall into a negative balance due to the delays between when they exhaust their credits and when they are actually disconnected for non-payment. This is referred to as “unpaid usage”, and per the program Terms and Conditions, must be paid as part of the process of reconnecting their service.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.17b
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.129 (4): “When a customer receives a past-due notice from the utility, the utility shall provide the customer access to information about energy assistance programs....” (MJH 24-25:21-2)

b. If a Prepay customer can have a past-due balance, why should the Company not provide the prescribed information about energy assistance programs?

Answer: Please see my response to AGCUBDE-2.17c regarding the concept of a past-due balance, which does not exist for prepaid utility services.

Additionally, as described in the Company’s testimony in the instant case, PrePay customers will receive information about receiving payment assistance as part of the information provided on their low-balance alerts.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.17c
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.129 (4): “When a customer receives a past-due notice from the utility, the utility shall provide the customer access to information about energy assistance programs....” (MJH 24-25:21-2)

c. If Prepay customers cannot have past-due balances, why is the Company requesting that this Rule be waived?

Answer: Please reference my response to AGCUBDE-2.17a and AGCUBDE-2.17b. PrePay customers will not receive past due notices, they receive low balance alerts.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.18
Respondent: M. Hatsios
Page: 1 of 1

Question: Question about requested waiver of Rule 460.139(1). Why does the Company believe it should not have to send a Prepay customer notice not less than ten days before the proposed shutoff of service? (MJH 25:4-7)

Answer: As described in the Company's testimony in the instant case, in lieu of a 10-day written notification of pending shutoff, customers who voluntarily enroll in PrePay can choose to receive daily balance alerts and will be able to check their balance daily to know how many days of usage they have left.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.19
Respondent: M. Hatsios
Page: 1 of 1

Question: How does the Company propose to respond if a Prepay customer's payment is dishonored by their financial institution, for example a bounced check or declined credit-card payment? If the customer's balance reaches zero because of declined form of payment, will the Company immediately shut off the customer's power?

Answer: Please reference Section 3 (*Account Monitoring and Management*) of Exhibit A-2 (*DTE PrePay Draft Terms and Conditions*) in the Company's testimony in the instant case for how the Company will treat returned payments for customers on PrePay.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.20a
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.139(6). (MJH 25:9-22)

- a. This rule pertains to involuntary shutoffs. Does the Company agree that a Prepay customer whose electricity has been shut off because their balance has reached zero has experienced an involuntary shutoff?

Answer: Yes, the Company would agree that, as is the case for a post-pay disconnection of service, the shutoff is involuntary in that the customer is not requesting that the Company disconnect their service.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.20b
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.139(6). (MJH 25:9-22)

b. Does the Company believe the communication actions it proposes to take at five, three, and one day(s) before shutoff are superior to the communication requirements adopted by the Commission in this Rule? Why?

Answer: The Company maintains that PrePay and post-pay models are completely different and therefore have different communication requirements, with PrePay putting customers in control and providing them those communications that will keep them informed of how much they are using and when they can expect to run out of credits.

For customers who voluntarily enroll in PrePay, the Company maintains that five, three, and one day notifications before shutoff provides customers adequate time to replenish their account in an amount that works for them to maintain a positive balance. Additionally, as stated in the Company's testimony in the instant case, customers can choose to receive daily notifications and will have access to their daily account balance through a CR, in the IVR, and on the Web.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.20c
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.139(6). (MJH 25:9-22)

c. In addition to the communication actions the Company proposes to take with Prepay customers at five, three, and one day(s) before shutoff, why should the Company not simply also follow this Rule?

Answer: Please see my response to AGCUBDE-2.20b.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.21a
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.140(1). (MJH 25-27:24-3)

- a. Witness Hatsios describes how the Company proposes to communicate with Prepay customers at five, three, and one day(s) before shutoff. What specific elements of 460.140(1) would not be included in those communications?

Answer: These notifications will not include the information included in sections d through j of Rule 460.140(1).

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.21b
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.140(1). (MJH 25-27:24-3)

b. For each element required under Rule 460.140(1) that would not be communicated to Prepay customers, please state why the Company believes it should not be required to include that information.

Answer: The Company maintains that the excluded items are not necessary for PrePay customers as they are in control of how much and how frequently they pay and can see daily how many days of usage they have left. There would be no past due amount to dispute.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.22a
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.140(2). (MJH 27-28:5-12)

a. Why does the Company believe this Rule should be waived for Prepay customers?

Answer: As previously stated, in both the Company's testimony in the instant case and in several of its discovery responses, PrePay is a completely different model than post-pay, and as such has different communication requirements to provide customers who voluntarily enroll the information they need to maintain a positive balance.

Specifically in regard to Rule 460.140(2), many elements of the rule do not apply to PrePay. Customers are not eligible to enroll in payment plans while on PrePay, combination customers will not be eligible to enroll in PrePay in the first phase of the program, and customers with certified medical emergencies will not be able to enroll in PrePay during any phase of the program.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.22b
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.140(2). (MJH 27-28:5-12)

b. Does the Company believe there is no need to notify Prepay customer facing shutoff that they may be eligible for energy assistance programs? Why?

Answer: No. As stated in the Company's testimony in the instant case, PrePay customers who are nearing a zero-balance will be provided, in their low balance alerts, Company contact information for assistance and a link to the energy assistance pages of the Company web site.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.22c
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.140(2). (MJH 27-28:5-12)

c. Does the Company believe that it should not be required to notify Prepay customers that they may be eligible for postponement of shutoff if they enroll in a low-income winter protection payment plan? Why?

Answer: No, the Company maintains that through the acknowledgement of the program Terms and Conditions, customers who voluntarily enroll in PrePay understand that they cannot be enrolled in another payment plan, but that they can unenroll from PrePay at any time without penalty if they wish to enroll in a payment plan, including winter protection.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.22d
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.140(2). (MJH 27-28:5-12)

d. Does the Company believe it should not be required to provide Prepay customers with telephone number of the department of human services or a 2-1-1 system number? Why?

Answer: Please reference my response to AGCUBDE-2.17b and 2.22b, in which I indicate that PrePay customers will be provided Company contact information and a link to the Company's energy assistance page on the DTE Web should they need to inquire about financial assistance. The Web has a complete list of all the agencies that could provide assistance, including the 2-1-1 contact information.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.22e
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.140(2). (MJH 27-28:5-12)

e. Does the Company not believe it should notify Prepay customers that it will postpone shutoff if a medical emergency exists at the customer's residence? Why?

Answer: The Company clearly states in the PrePay Terms and Conditions that customers with medical emergencies at the site will not be eligible for PrePay. Should a PrePay customer inform the Company that they now have a medical emergency at the site, they will be removed from PrePay and reverted back to post-pay service and the account noted as such.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.23a
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.143(1). (MJH 28:14-20)

- a. Why is this waiver necessary for the Prepay program? Specifically, why should the Company not have to inform Prepay customers that shutoff will occur remotely and a utility representative will not visit the premises before disconnection?

Answer: Customers must have an active AMI meter to enroll in PrePay, and customers who enroll in PrePay will be informed that disconnects and reconnects will be remote, with no site visits by a utility representative. Additionally, the Company will add this language to the program Terms and Conditions.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.23b
Respondent: M. Hatsios
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.143(1). (MJH 28:14-20)

b. What is the difference between post-pay and Prepay customers that makes this notification unnecessary for the latter?

Answer: Please reference my response to AGCUBDE-2.23a.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.23c
Respondent: M. Hatsios / Legal
Page: 1 of 1

Question: Questions about requested waiver of Rule 460.143(1). (MJH 28:14-20)

c. How can the Company be sure that shutoff will not endanger the health or safety of household members if no utility representative visits the premises before shutoff?

Answer: DTE Electric objects for the reason that the request is unclear and unduly vague since the Company is unclear regarding the meaning of the phrase, "how can the Company be sure." Subject to this objection, and without waiving this objection, PrePay remote disconnects will be no different than post-pay remote disconnects, for which no utility representative visits the premise before shutoff.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.24
Respondent: M. Hatsios
Page: 1 of 1

Question: If a Prepay customer's electricity is shut off after reaching zero balance, will the Company allow that customer to switch back to post-pay status and restore power as soon as that switch is made?

Answer: Customers can unenroll from the program at any time, including after their account reaches a zero balance. Customers who switch to post-pay would have power remotely restored usually within 30 minutes and nearly always within 4 hours unless factors outside of the Company's control prevent reconnection.

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.24a
Respondent: M. Hatsios
Page: 1 of 1

Question: If a Prepay customer's electricity is shut off after reaching zero balance, will the Company allow that customer to switch back to post-pay status and restore power as soon as that switch is made?

a. If that same customer has a past-due balance, will the Company still allow the customer to convert back to post-pay status?

Answer: Yes, any PrePay customer can revert back to post-pay at any time. Customers who choose to convert and would be subject to the same deposit and balance transfer rules as any other post-pay customer as part of the transition to post-pay and the reconnection of service

Attachments: None.

MPSC Case No.: U-21087
Requestor: AGCUB
Question No.: AGCUBDE-2.24b
Respondent: M. Hatsios / Legal
Page: 1 of 1

Question: If a Prepay customer's electricity is shut off after reaching zero balance, will the Company allow that customer to switch back to post-pay status and restore power as soon as that switch is made?

b. If a Prepay customer approaches or reaches zero balance, and the Company becomes aware that a member of the customer's household is senior, low-income, very young, medically vulnerable, or otherwise endangered by loss of power, what will the Company do?

Answer: DTE Electric objects for the reason that the request is unclear and unduly vague since the Company is unclear regarding the meaning of the phrases, "very young" and "otherwise endangered." Subject to this objection, and without waiving this objection, the Company would take no action for customers who are seniors or low-income, as they are eligible to voluntarily enroll in PrePay and can unenroll at any time and enroll in a payment plan if they so choose. In the case of a medically vulnerable customer, please reference my response to AGCUBDE-2.22e.

Attachments: None.

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application of **DTE Electric**)
Company for the approval of a partial waiver of)
the Consumer Standards and Billing Practices for)
Electric Residential Service and approval of a)
Voluntary Prepay Billing Program.)

Case No. U-21087

PROOF OF SERVICE

CAITLIN MYERS states that on January 7, 2022, she served a copy of the DTE Electric Company's Response to Michigan Attorney General and Citizen's Utility Board of Michigan's Second Discovery Request in the abovementioned matter, via electronic mail upon the persons listed on the attached service list.

Digitally signed by Caitlin D.
Myers
Date: 2022.01.07 12:21:39
-05'00'

CAITLIN D. MYERS

MPSC Case No. U-21087

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Citizens Utility Board of Michigan - Comments on Service Quality and Reliability Standards for Electric Distribution Systems (U-20629)

NOW COMES the Citizens Utility Board of Michigan (“CUB”) to file these comments pursuant to the Michigan Public Service Commission staff’s request for comments following the January 8, 2020 meeting of the Service Quality & Reliability Workgroup. The Citizens Utility Board (CUB) of Michigan is an independent, nonpartisan organization that represents the interests of residential utility customers across the state.

CUB once again appreciates an opportunity to comment on needed updates to the Service Quality and Reliability Standards. We thank the MPSC staff for the attention paid to our comments submitted for the first Workgroup meeting. The Staff’s presentation showed a detailed reading of CUB’s ideas. In particular, the staff looked favorably upon CUB’s suggestions to 1. add another category beyond “normal” conditions and “catastrophic” conditions, and 2. Increasing the compensation based on the duration of outage.

1. Size and Structure of Bill Credits

In that Jan. 8 meeting, the MPSC staff asked CUB to clarify our proposal on how to structure the bill credit, and how it would be tied to the reliability metric SAIDI. We apologize for the lack of clarity in our previous comments – we were attempting to sketch broad ideas in order to start discussion.

We will use these comments as an opportunity to lay out a more detailed picture of how to implement our proposed bill credit, as well as the equally important question of what amount to allow for utility rate recovery.

To clarify, CUB’s proposal regarding the bill credit is very simple: the credit should be \$2 per hour of outage. The value of \$2 is not chosen arbitrarily, although we are certainly open to suggestions for a more precise number. First, \$2 is based on a model created by the Interruption Calculator, developed by the U.S. Department of Energy and the Lawrence Berkeley National Laboratory.¹ CUB used this calculator to estimate the cost to one residential customer in Michigan based on average SAIDI² and CAIDI³ values for the state’s utilities.

Second, \$2 is a rough match to the current credit of \$25 per event, but like the Staff’s proposal of \$50 per event, CUB’s proposal would substantially increase the potential credit due to a customer.

In addition, the fact that CUB’s proposed credit would be administered on an hourly basis makes it more flexible compared to a one-size-fits-all approach. Michigan SAIDI was 779 minutes in 2017, according to CUB’s Electric Utility Performance Report 2019⁴, or about 13 hours. The five-year average SAIDI for Michigan was 546.6 minutes, or about 9 hours.

The five-year average SAIFI⁵ was 1.77 interruptions per customer. So at nearly 2 power outage events per year for a customer, if those events meet the current threshold for triggering bill credits, then the staff’s proposal means that the average customer would receive \$100 per year (\$50 for two outages.) However,

¹ <https://icecalculator.com/build-model?model=interruption>

² Annual System Average Interruption Duration Index.

³ Customer Average Interruption Duration Index.

⁴

https://d3n8a8pro7vhmx.cloudfront.net/cubofmichigan/pages/15/attachments/original/1563405525/CUB_of_MI_Electric_UTILITY_Performance_Report_2019_Edition_Final_for_Website.pdf?1563405525

⁵ Annual System Average Interruption Frequency Index.

because so few outages go on long enough to meet the current thresholds of 16 hours for normal grid conditions and 120 hours for catastrophic grid conditions, the average customer would receive dramatically less than \$100.

Under CUB's proposal, however, a customer on average would receive only \$18 in a year (\$2 credit for 9 hours). In addition the number of customers receiving credits would increase significantly relative to the staff's proposal because credit eligibility would no longer be limited by the current thresholds.

An hourly credit properly recognizes that even relatively short outages have an economic cost to customers, and that the cost compounds over time if the power stays out. As mentioned in CUB's previous comments, this commonsense position is backed up by Lawrence Berkeley National Laboratory research.⁶

Under our proposal, the SAIDI metric would again come into play when determining the amount of bill credits that a utility can recover from customers through rates. CUB proposes an adjustment that will incentivize utilities to improve reliability, while still allowing them to recover fairly incurred costs.

We propose that rates be set based on an assumption that the utility recovers bill credits with a value of \$2 multiplied by the national average SAIDI. To be clear, the actual payout for bill credits would still be \$2 per hour. But if, for example, the national average SAIDI is 150 minutes, or 2.5 hours, then rates would include the assumption that the utility is recovering bill credits of \$5 per customer per year. The utility would fully recover their costs if its average SAIDI was 150 minutes. If the utility's SAIDI is less than the average, then the utility is essentially able to earn an extra return. For example, if the utility's SAIDI was less than 120 minutes, it would be charging ratepayers as if the credit was \$5, but only paying out an average of \$4 per customer, giving a rate of return from an extra \$1 per customer. If the utility's SAIDI was worse than the national average, the payment of bill credits would function as a penalty.

The result is that the utility has a financial incentive to improve the average number of minutes of outage per customer.

We do not think that \$2 per hour is necessarily the right bill credit to use in the long run, but we are using it here for illustrative purposes. CUB recommends that the Commission include in the administrative rules an obligation for utilities to collect necessary data from affected customers using methods like those used by the Lawrence Berkeley National Laboratory and that those data be made available to the Commission and stakeholders for the purpose of finding the correct value over time.

2. Question from Jan. 8 meeting: "Residential Consumers: How do momentary outages affect you?"

The Lawrence Berkeley National Laboratory paper cited above estimated the costs of momentary outages. For residential customers, the paper found that the cost of a momentary outage varies depending on the time of day, from \$1.5 for non-summer evening outages to \$6.8 for summer morning/night outages. The paper's weighted average of these costs is \$3.9.

This finding supports the contention that utilities should be tracking momentary outages. Momentary outages have real economic costs that are not trivial compared to longer-duration outages. The \$3.9

⁶ <https://emp.lbl.gov/sites/all/files/lbnl-6941e.pdf>

weighted average for momentary outages is only 6 cents less than the \$4.5 weighted average cost for a 30-minute outage and \$1.2 less than the \$5.1 cost for a 1-hour outage, according to the paper.

The finding also suggests that, as the staff asked, the benefits of reliability would be significantly decreased if sustained interruptions decreased, but momentary outages increase.

3. Additional categories

An hourly bill credit, as outlined above, would solve the challenge the MPSC staff is facing regarding the current thresholds for determining credit eligibility. The staff appears open to adding another category, recognizing that the thresholds of a) 16 hours under normal conditions and b) 120 hours under catastrophic conditions severely limits the number of customers who can receive bill credits, even as outages are becoming a bigger problem.

But how can a third category be added without using another arbitrary threshold like 16 hours or 120 hours? The hourly approach, CUB suggests, avoids that problem. With a \$2 hourly credit, for longer outages customers would receive a substantive credit similar to the \$25 credit, and for shorter outages, customers would receive a smaller credit.

As for grid-catastrophic conditions, an hourly approach could lead to dramatically higher credits, as in the case of a 120-hour outage. But, as discussed above, the utility could recover the costs of these credits, under CUB's proposal.

We look forward to the next Workgroup meeting to further discuss our proposals.