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September 30, 2025

Ms. Lisa Felice
Executive Secretary
Michigan Public Service Commission
7109 W. Saginaw Highway
P.O. Box 30221
Lansing, MI 48909

Re: MPSC Case No. U-21870

Dear Ms. Felice:

Attached for electronic filing in the above-captioned matter, please find the Direct Testimonies & Exhibits of Sophia Schuster, Brett Sproul and John D. Albers on Behalf of the Michigan Energy Innovation Business Council, the Institute for Energy Innovation, and Advance Energy United

Thank you for your assistance in this matter.

Sincerely yours,

VARNUM

Justin K. Ooms

JKO/lml
Enclosures

c: All parties of record.

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

****

In the matter of the application of **Consumers Energy Company** for authority to increase its rates for the generation and distribution of electricity and for other relief.	)))))	**Case No. U-21870**

DIRECT TESTIMONY OF SOPHIA SCHUSTER

ON BEHALF OF

THE MICHIGAN ENERGY INNOVATION BUSINESS COUNCIL,

INSTITUTE FOR ENERGY INNOVATION,

AND

ADVANCED ENERGY UNITED

Table of Contents

I. INTRODUCTION AND QUALIFICATIONS

Q. State your name, business name and address.

A. My name is Sophia Schuster, and I am a Policy Principal with the Michigan Energy Innovation Business Council ("Michigan EIBC") and the Institute for Energy Innovation ("IEI"), located at 115 West Allegan Street, Suite 710, Lansing, Michigan 48933.

Q. On whose behalf are you appearing in this case?

A. I am appearing here as an expert witness on behalf of Michigan EIBC, IEI, and Advanced Energy United ("United"), collectively referred to as "MEIU."

Q. Summarize your educational background.

A. I have a Master's in Supply Chain Management and a Master's in Business Administration from the Pennsylvania State University, conferred in May 2023 and in May 2019, respectively. I also have a Bachelor of Arts degree from Albright College, conferred in May 2012.

Q. Summarize your experience in the field of electric utility regulation.

A. Since October 2023, I have served as a Policy Principal at Michigan EIBC and IEI. In this capacity, I have assisted in drafting comments in many non-adjudicated dockets before the Michigan Public Service Commission ("Commission" or "MPSC"). Also in this capacity, I have provided policy expertise, conducted research, and analyzed regulations related to advanced transportation and mobility. My work experience is set forth in detail in my resume, attached as Exhibit MEIU-1.1.

Q. Summarize your professional development coursework in the field of electric utility regulation.

A. I have completed the following coursework related to electric utility regulation:

- March 2024 - Electric vehicle ("EV") Charging Infrastructure (Electric Utility Consultants, Inc. ("EUCI"))
- March 2024 - Time of Use ("TOU") Rate Design: Advantages, Issues, and Challenges (EUCI)
- March 2025 - Accounting and Ratemaking (Michigan State University, Institute of Public Utilities)
- May 2025 - Basics of Electricity and Utility Systems Part 2 (EUCI)

Q. Have you written or supported the writing of testimony or comments in any other utility regulatory proceeding before this Commission?

A. Yes, I have previously written or supported the writing of testimony and comments in the following cases and utility regulatory proceedings:

- U-21860 (DTE Electric Company general electric rate case);
- U-21534 (DTE Electric Company general electric rate case);
- U-21585 (Consumers Energy Company ["Consumers Energy," "Consumers," or the "Company"] general electric rate case); and
- U-21492 (Transportation Electrification Plan ["TEP"] filing requirements).

In addition to this work, I have been involved on behalf of Michigan EIBC in multiple workgroup proceedings at the Commission, including those focused on electric vehicle

("EV") deployment, benefit-cost analyses, Integrated Resource Plan ("IRP") requirements, and distribution system planning.

Q. Please summarize your experiences working with advanced energy companies and other key stakeholders on issues related to electric utility regulation.

A. I have served as a Policy Principal at Michigan EIBC and IEI since October 2023. In this role, I have led the organizations' transportation electrification work. I have led the development and publication of several pieces of transportation electrification research, including a roadmap highlighting key policy opportunities to enable the state's transportation electrification goals[1] and a report discussing the critical role of the automotive industry to the Michigan economy.[2] As described above, I have also participated in several workgroups at the Commission and supported the drafting of written comments in a number of non-adjudicated dockets. I also communicate formally and informally with Michigan EIBC member companies about each of these regulatory proceedings to understand how the advanced energy industry is affected. In addition, I participate in several coalitions focused on enabling the state's advanced mobility goals and facilitating a safe and equitable transition to EVs for Michigan's drivers and communities, including the Council on Future Mobility and Electrification's EV Action Team. In this capacity, I communicate formally and informally with coalition members about current regulatory proceedings and how each impacts any shared objectives.

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[1] Michigan Energy Innovation Business Council and Clean Fuels Michigan, *Transportation Electrification in Michigan: A Roadmap to State Policy Actions*, October 2024, available at https://www.mieibc.org/wp-content/uploads/2024/10/Transportation-Electrification-in-Michigan.pdf.

[2] Michigan Energy Innovation Business Council, *Legacy, Innovation, and the Race Against China: The Automotive Industry and the Michigan Economy*, May 2025, available at https://www.mieibc.org/wp-content/uploads/2025/05/Auto-Leadership-and-the-Michigan-Economy_MIEIBC.pdf.

Q. What is the purpose of your testimony?

A. The purpose of my direct testimony is to express support for certain aspects of the Company's EV proposals as well as describe proposed modifications thereto based on my experiences in the transportation electrification policy space.

Q. Are you sponsoring any exhibits?

A. Yes, I am sponsoring the following exhibits:

- Exhibit MEIU-1.1: Résumé of Sophia Schuster, MBA, MSCM
- Exhibit MEIU-1.2: Discovery Response MEIU-CE-0039
- Exhibit MEIU-1.3: Discovery Response MEIU-CE-0043
- Exhibit MEIU-1.4: Discovery Response MEIU-CE-0042

II. TRANSPORTATION ELECTRIFICATION

A. OVERVIEW OF CONSUMERS ENERGY'S TRANSPORTATION ELECTRIFICATION PLAN ("TEP")

Q. Please summarize Consumers Energy's transportation electrification proposals in this case.

A. The Company's proposals regarding transportation electrification are presented primarily in the direct testimony of Jeffrey A. Myrom,[3] and in the Company's Transportation

[3] Direct Testimony of Jeffrey A. Myrom on behalf of Consumers Energy ("Myrom Direct"), Case No. 21870.

Electrification Plan 2025 Annual Progress Report ("TEP 2025 annual update").[4] The Company describes the load optimization benefits to all customers resulting from increased EV adoption and then details the status of its existing TEP program elements, approved in Case No. U-21585 (the Company's most recent general electric rate case). The major elements included in the TEP are:

- *Residential programming*. This includes "educational outreach, time-of-use ("TOU") rate, and rebate and incentive programs for off-peak charging at Level 2 ("L2") circuit levels of 50 amps or less" for single-family homes ("SFH").[5] Participants accessing a SFH rebate are eligible for up to $500 (or $1,000 for low-income ("LI") customers). To reinforce the desired off-peak charging behavior, participants can also enroll in the company's TOU rate for which they are eligible to receive a bill credit of $10 per month for one year.[6] Additionally, the Company is implementing a referral incentive program and a dual-cord L2 and splitter incentive.[7]

  Residential programming also includes strategic opportunities for multifamily housing ("MFH") properties that need to add a second service.[8] Properties where L2 charging cannot be tied to a resident's meter or parking space are eligible for a rebate of up to

[4] Consumers Energy, "Transportation Electrification Plan Annual Progress Report 2025," Case No. U-21538, Filing No. U-21538-007 (June 27, 2025).

[5] Myrom Direct, p. 6.

[6] *Ibid*.

[7] *Id*., pp. 6-7.

[8] *Id*., pp. 7-8.

$7,500 "to add a separate service with at least two plugs powered by 100 amps."[9] Property owners receive signage and informational materials and can access a TOU bill credit of $20 per month for one year if at least 80% of charging takes place off-peak;[10]

- *Public programming*. Like its residential programming, the Company's public L2 and Level 1 ("L1") efforts include educational outreach, TOU rates, and rebates.[11] Examples of public programming applications include community chargers, and chargers at hotels and tourism destinations; and
- *Fleet programming*. The fleet and workplace charging programming focuses on "outreach, TOU rate, and rebate programs for small and medium businesses, local governments, non-profits, and educational institutions to incentivize off-peak charging."[12] Like MFH properties, fleet and workplace participants are eligible for rebates of up to $7,500 per two plugs powered by 100 amps.[13] For L2 chargers in a workplace setting that can also serve the local community outside business hours, participants are eligible for an enhanced rebate of up to $10,000.[14] A rebate of up to $15,000 for direct current fast charging ("DCFC") of up to 50kW per plug is also available to fleet operators with medium- and heavy-duty ("MHD") vehicles.[15]

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[9] *Id*., p. 7.

[10] *Id*., p. 8.

[11] *Id*., pp. 8-9.

[12] *Id*., p. 9.

[13] *Ibid*.

[14] *Ibid*.

[15] *Id*., pp. 9-10.

The Company is not proposing any cost increases relative to the Company's most recent general electric rate case (Case No. U-21585), nor is it shifting its focus from its core strategy to optimize off-peak charging.[16] However, the Company does propose several so-called "enhancements" to the TEP programs. These include:

- A request to allow L2 and L1 rebates across all categories to be used for the installation of an appropriate weatherized and EV-rated National Electric Manufacturers Association ("NEMA") outlet; and
- A request to modify its public DCFC rebate pilot.

B. EV ADOPTION FORECASTS

Q. How does Consumers predict that EV sales will grow in the Company's service territory?

A. In his direct testimony, witness Myrom presents a base case and a high case, and reports that

> EV load growth has been at or above the "500K EV[s]" by 2030 EV scenario utilized in the 2021 Integrated Resource Plan (Case No. U-21090), annual TEP related reports, and prior electric rate cases…The latest data from the Michigan Secretary of State also indicates that a range [of] 470,000 to 600,000 EVs by 2030 [is] likely in the Company's territory.[17]

In a discovery response (Exhibit MEIU-1.2), witness Myrom notes that

> [t]he base case model tracks historic adoption of EVs in Consumers Energy's electric territory utilizing actual Michigan Secretary of State (SOS) quarterly data. The model utilizes historic sales trends to predict EV adoption in the near term, and once adoption levels achieve 7% or greater,

[16] *Id*., p. 12.

[17] *Id*., p. 11.

> the projection then approximates the percentage of sales experienced by Norway.

Witness Myrom goes on to state (Exhibit MEIU-1.2) that

> [t]he high case incrementally magnifies the base case projection over time to +25%, representing the continuation of cost and range improvements via technology advances, public charging infrastructure improvements, and economies of scale via factory and battery chemistry developments, all contributing to higher levels of EV adoption than the historic Norway pathway.

Witness Myrom also notes that EV adoption within the Company's service territory does not capture the load growth attributable to EVs driving through its electric territory to reach and stay in popular Michigan tourist destinations.[18] As such, EV load growth is driven not only by EVs adopted within the Company's service territory, but also by drivers traveling through its service territory. Consequently, witness Myrom asserts that total EV load growth is a more appropriate metric than EV adoption for assessing the impact of the Company's TEP programs.[19]

Q. What is the current state of automotive EV sales in the U.S. and in Michigan?

A. In 2019, nearly 315,000 new light-duty EVs were sold throughout the United States, making up just 1.8% of total vehicle sales at the time.[20] Only five years later, new light-duty ("LD") EV sales reached 1.48 million nationwide, marking a 369.8% sales increase between 2019 and 2024 and bringing the number of total new EVs on the road to 6.4

[18] *Id*., p. 12.

[19] *Ibid*.

[20] Atlas Public Policy, *EV Hub - EV Market Dashboard,* July 2025, available at https://www.atlasevhub.com/market-data/ev-market-dashboard/.

million.[21] Today, there are nearly 7 million EVs on the road, with EV sales now accounting for almost 10% of automotive sales.[22] In Michigan, the market share for EV sales increased year-over-year from 4.4% in the second quarter of 2023 to 11.3% in 2025.[23] Equally remarkable is the growth of the MHD market segment, which grew from about 1,400 new MHD EV purchases in 2021 to 124,000 in 2024 - an astounding 8,800% sales increase.[24] These trends across the country and in Michigan clearly indicate a steady and accelerating EV adoption growth rate.

Q. What impact could the current political and economic climate have on automotive sales and EV sales specifically?

A. Since the start of 2025, several federal actions have resulted in increased uncertainty across the automotive industry. These include:

[21] *Ibid.*

[22] *Ibid.*

[23] *Ibid.*

[24] *Ibid.*

- The introduction of a 25% tariff on some imported vehicles,[25] as well as tariffs on several components critical to vehicle manufacturing, such as steel, aluminum, copper, energy, and imported minerals;[26, 27, 28]
- The repeal of several tax credits which were part of the Inflation Reduction Act, including the 30C Alternative Fuel Vehicle Refueling Property Credit and the 30D Clean Vehicle Credit;[29, 30]
- The nullification under the Congressional Review Act of EPA Clean Air Act preemption waivers for California's Advanced Clean Cars II;[31, 32] and

[25] Cox Automotive, "Auto Industry Braces for Impact: 25% Tariffs on Imported Vehicles Set to Disrupt Market," March 2025, available at https://www.coxautoinc.com/market-insights/auto-industry-braces-for-impact-25-tariffs-on-imported-vehicles-set-to-disrupt-market/.

[26] Brinley, S., S&P Global, "How Tariffs are Affecting the Automotive Industry," April 2025, available at https://www.spglobal.com/automotive-insights/en/rapid-impact-analysis/us-auto-tariffs-impact-on-auto-industry.

[27] *MotorTrend*, "How Are Trump's Tariffs Impacting Cars, Costs, and Customers? Japan Gets a Huge Break," July 2025, available at https://www.motortrend.com/news/trump-tariffs-trade-war-automotive-industry-impact-developments.

[28] Carpenter, J., "Carpenter: Return of Trump tariffs could impact state's innovative industries," *The Detroit News.*, February 2025, available at https://www.detroitnews.com/story/opinion/2025/02/12/carpenter-return-of-trump-tariffscould-impact-states-innovative-industries/78422652007/.

[29] Evergreen Action, "Republican Megabill Is a Disaster for Energy Costs, Jobs, and Clean Energy," June 2025, available at https://www.evergreenaction.com/blog/senate-gops-updated-megabill-is-still-a-disaster-for-affordability-jobs-and-clean-energy.

[30] *The Business Times*, "Tesla braces for rough quarters ahead as US ends EV incentives," July 2025, available at https://www.businesstimes.com.sg/companies-markets/transport-logistics/tesla-braces-rough-quarters-ahead-us-ends-ev-incentives.

[31] Brinley, St., S&P Global, "California's Advanced Clean Cars II ZEV rules under fire," May 2025, available at https://www.spglobal.com/automotive-insights/en/blogs/2025/05/california-advanced-clean-cars-zev-rules.

[32] Manescu, L., Sierra Club, "Donald Trump Signs Reversal of State Clean Car Standards, Selling Out Americans to Polluters and Unraveling Clean Air Act Protections," June 2025, available at https://www.sierraclub.org/press-releases/2025/06/donald-trump-signs-reversal-state-clean-car-standards-selling-out-americans.

- The elimination of civil penalties for automakers failing to meet Corporate Average Fuel Economy ("CAFE") standards.[33]

Q. Do you agree with the EV deployment rate predicted by the Company and its response to current political and economic conditions?

A. Yes. While there may be a slowdown in EV adoption and automotive manufacturing in the short term, experts agree that EVs represent the future of the industry – both in the United

[33] Sidley, "Congress Eliminates Corporate Average Fuel Economy (CAFE) Penalties for Passenger Cars and Light Trucks," July 2025, available at https://environmentalenergybrief.sidley.com/2025/07/08/congress-eliminates-corporate-average-fuel-economy-cafe-penalties-for-passenger-cars-and-light-trucks/.

States and globally.[34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45] Global trends clearly indicate stable EV adoption growth, particularly in European, Southeast Asian, and South American

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[34] Hertzke, P. et al., McKinsey & Company, "New twists in the electric-vehicle transition: A consumer perspective," April 2025, available at https://www.mckinsey.com/features/mckinsey-center-for-future-mobility/our-insights/new-twists-in-the-electric-vehicle-transition-a-consumer-perspective.

[35] Andreoni, M., "The Electric Vehicle Future Is Coming. Just a Little More Slowly," *The New York Times*, September 2024, available at https://www.nytimes.com/2024/09/05/climate/electric-vehicle-sales-projections.html.

[36] Ewing, J., "Trump Will Slow, but May Not Stop, the Rise of Electric Vehicles," *The New York Times*, August 2025, available at https://www.nytimes.com/2025/08/03/business/trump-electric-vehicles.html.

[37] International Energy Agency, *Global EV Outlook 2024: Trends in electric cars*, March 2025, available at https://www.iea.org/reports/global-ev-outlook-2024/trends-in-electric-cars.

[38] Domonoske, C., "Trump's pulling a U-turn on EVs, but not much has changed — yet," *NPR*, January 2025, available at https://www.npr.org/2025/01/30/nx-s1-5272749/donald-trump-ev-electric-vehicles-subsidies-auto-industry.

[39] Gross, P., "EV Industry will Persist, Experts Say, Despite Trump Cuts," *Missoula Current*, March 2025, available at https://missoulacurrent.com/ev-industry-trump/.

[40] Rivers, S., "Jim Farley: 'If We Lose This, We Do Not Have A Future Ford'," *CarScoops*, July 2025, available at https://www.carscoops.com/2025/07/jim-farley-if-we-lose-this-we-do-not-have-a-future-ford/.

[41] Marshall, A., "Ford Is Sticking With an EV Future—With a Boost From Tesla," *Wired*, March 2025, available at https://www.wired.com/story/ford-ev-charging-adapters-for-tesla-superchargers/.

[42] Jain, S., "Tesla Is Still Selling Glossy Future - GM Just Shipped 111% More EVs," *Yahoo! Finance*, July 2025, available at https://finance.yahoo.com/news/tesla-still-selling-glossy-future-150621575.html.

[43] Bassett, A., "Why GM's CEO is still betting on electric vehicles (and racing)," *The Verge*, July 2025, available at https://www.theverge.com/gm-general-motors/705320/gm-ceo-mary-barra-interview-ev-cadillac-dei-trump.

[44] Chang, J., "Are EVs the Future of GM?," *Wall Street Journal Podcasts, Tech News Briefing*, June 2025, available at https://www.wsj.com/podcasts/tech-news-briefing/are-evs-the-future-of-gm/4cbe61e3-9159-4d49-9c18-bfe2ba9de618?gaa_at=eafs&gaa_n=ASWzDAjvEtVc0hn7qrtdnskv85q_nER8swRg2lVr4MCIaX4jYVWUfzbPRbGHsS4x8Kk%3D&gaa_ts=6887614a&gaa_sig=jSxbs5i7GCMo2lLLHosoQ3ToE4ze447F7ZR5f04QUnNGkSz2tMtm86lOAfPzoOlusdsI24KrW8d3OIkvW-Tw-w%3D%3D.

[45] Reuss, M., "From Tennessee to Michigan, GM is building a battery-powered future," *GM News*, July 2025, available at https://news.gm.com/home.detail.html/Pages/topic/us/en/2025/jul/0714-Tennessee-Michigan-battery-powered-future.html.

markets.[46, 47] To compete with a burgeoning Chinese EV industry, American automakers will need to continue producing EVs to remain globally competitive.[48] In addition to automakers' motivation to invest in EV development and production, improved EV

[46] International Energy Agency, *Global EV Outlook 2024: Trends in electric cars*, March 2025, available at https://www.iea.org/reports/global-ev-outlook-2024/trends-in-electric-cars.

[47] Chang, A. and Bradsher, K., "How China Became the World's Largest Car Exporter," *The New York Times*, November 2024, available at https://www.nytimes.com/interactive/2024/11/29/business/china-cars-sales-exports.html.

[48] Reuters, "China's electric vehicles are around 3-5 years ahead, BYD CEO says," February 2025, available at https://www.reuters.com/business/autos-transportation/chinas-electric-vehicles-are-around-3-5-years-ahead-byd-ceo-says-2025-02-18/.

range[49, 50, 51, 52] and price competitiveness,[53, 54, 55, 56, 57, 58, 59] the growth of the used EV market,[60] and supportive state actions[61, 62, 63] will enable continued EV adoption growth through this period of political and economic uncertainty at the federal level.

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[49] Elliott, D., World Economic Forum, "5 developments that could make owning an EV more convenient," October 2024, available at https://www.weforum.org/stories/2024/10/electric-vehicles-batteries-charging/.

[50] Shakir, U., "Heat pumps in EVs are making a big difference in cold-weather driving," *The Verge*, January 2025, available at https://www.theverge.com/2025/1/23/24350602/electric-vehicle-heat-pump-better-range-tesla-etron-mustang-mach-e.

[51] Kothari, S., "Even Affordable EVs Are Getting Solid-State Batteries Now," *Inside EVs*, July 2025, available at https://insideevs.com/news/766509/affordable-ev-solid-state-battery-mg4-china/.

[52] Ghoshal, A., "BMW promises 30% longer range in upcoming EVs with custom batteries," *New Atlas*, March 2025, available at https://newatlas.com/automotive/bmw-longer-range-neue-klasse-ev-batteries/.

[53] Foote, B., "Ford CEO Jim Farley Says Next Gen EVs Will Be Cheaper Than Current Lineup," *Ford Authority*, June 2025, available at https://fordauthority.com/2025/06/ford-ceo-jim-farley-says-next-gen-evs-will-be-cheaper-than-current-lineup/.

[54] Slowik, P. et al., International Council on Clean Transportation, *Assessment of light-duty electric vehicle costs and consumer benefits in the United States in the 2022–2035 time frame*, October 2022, available at https://theicct.org/publication/ev-cost-benefits-2035-oct22/.

[55] Stoklosa, A., "The Super-Affordable 2027 Chevrolet Bolt EV Is Coming Soon—Very Soon," *Motortrend*, June 2025, available at https://www.motortrend.com/news/2027-chevrolet-bolt-everything-you-need-to-know.

[56] Banner, J., "The Cheap Tesla Is Almost Here—and We Finally Know What It'll Look Like," *Motortrend*, July 2025, available at https://www.motortrend.com/news/cheap-tesla-model-y-coming-2025.

[57] Kothari, S., "General Motors Says New LMR Battery Will Deliver Major Cost Savings," *Inside EVs*, July 2025, available at https://insideevs.com/news/766646/gm-lmr-battery-cost-savings-lfp/.

[58] GM News, "GM and LG Energy Solution to pioneer LMR battery cell technology," May 2025, available at https://news.gm.com/home.detail.html/Pages/news/us/en/2025/may/0513-GM-LG-Energy-Solution-pioneer-LMR-battery-cell-technology.html.

[59] Mile, N., "Ford's Michigan EV battery plant backed by tax credits after political reboot," *Fox: WFXR*, July 2025, available at https://www.wfxrtv.com/automotive/fords-michigan-ev-battery-plant-backed-by-tax-credits-after-political-reboot/?nxsparam=9.

[60] Toussaint, K., "The first big batch of used EVs will hit the market in 2026. No one knows what's going to happen," *Fast Company*, January 2024, available at https://www.fastcompany.com/91018102/the-first-big-batch-of-used-evs-will-hit-the-market-in-2026-no-one-knows-whats-going-to-happen.

[61] Department of Environment, Great Lakes, and Energy, "Clean Fuel and Charging Infrastructure Program," accessed July 2025, available at https://www.michigan.gov/egle/about/organization/materials-management/energy/rfps-loans/clean-fuel-and-charging-infrastructure-program.

Q. Do you expect that the global automotive industry will continue to encourage EV adoption in the short- and long-term?

A. Despite the retraction of federal support in the United States, experts and industry leaders in the global automotive sector still firmly believe that EVs are the future of transportation.[64, 65] In fact, the 2025 EV Outlook report by Bloomberg New Energy Finance ("BloombergNEF") finds that EVs will reach 56% of new vehicle sales globally by 2035 and 70% by 2040, which is only a 3% decrease from the previous outlook conducted in 2020.[66] Furthermore, the same BloombergNEF report indicates that the United States will have just over 35 million EVs on the road by 2035,[67] only marking a 5-year slowdown in EV adoption from forecasts developed in 2024.[68] Consequently, while EV adoption

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[62] Executive Office of the Governor, "Executive Directive 2023-5: Conversion of State Fleet," December 2023, available at https://www.michigan.gov/whitmer/news/state-orders-anddirectives/2023/12/05/executive-directive-2023-5-conversion-of-state-fleet.

[63] Michigan Department of Transportation, "MDOT NEVI Design-Build-Operate-Maintain (DBOM) Project - Notification of Selection," June 2025, available at https://www.michigan.gov/mdot/-/media/Project/Websites/MDOT/Business/Contractors/Innovative-Contracting/NEVI---2/Notification-of-Selection.pdf?rev=6451b2352ab14cd2a84a075496f62c6f&hash=12DC631641D6A886192976DBDA00C8D8.

[64] Andreoni, M., "The Electric Vehicle Future Is Coming. Just a Little More Slowly," *The New York Times*, September 2024, available at https://www.nytimes.com/2024/09/05/climate/electric-vehicle-sales-projections.html.

[65] Bloomberg, "Despite Hurdles, Vehicle Electrification in the US Is Likely Here to Stay, Finds Bloomberg Intelligence," April 2024, available at https://www.bloomberg.com/company/press/despite-hurdles-vehicle-electrification-in-the-us-is-likely-here-to-stay-finds-bloomberg-intelligence/.

[66] BloombergNEF, *Electric Vehicle Outlook 2025*, 2025, available at https://assets.bbhub.io/professional/sites/24/202506-EVO2025-Executive-Summary.pdf.

[67] *Ibid.*

[68] BloombergNEF, "Electric Vehicle Outlook 2025 Overview," accessed August 2025, available at https://about.bnef.com/insights/clean-transport/electric-vehicle-outlook/#overview.

forecasts in the United States have changed, EVs will continue to make up a growing portion of new vehicle sales over the next decade.

American automakers recognize that to stay competitive in the race for global automotive sales, they will have no choice but to continue producing and investing in EVs. In 2023, global EV sales neared $14 million, largely driven by a rapidly growing Chinese automotive manufacturing industry that specializes in EV production.[69] With over 100 EV brands at various price points,[70] nearly 6 million EVs were sold domestically in China in 2022, and in 2023 that number increased even further by 35% to 8.1 million.[71, 72] In 2023, China overcame Japan as the world's leading vehicle exporter with 5.7 million vehicles exported,[73] 25% of which were EVs.[74, 75] Currently, 60% of the world's EVs and over 75% of the batteries that go into them are produced in China,[76] and new markets for Chinese

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[69] International Energy Agency, *Global EV Outlook 2024: Trends in electric cars*, March 2025, available at https://www.iea.org/reports/global-ev-outlook-2024/trends-in-electric-cars.

[70] Reuters, "China's electric vehicles are around 3-5 years ahead, BYD CEO says," February 2025, available at https://www.reuters.com/business/autos-transportation/chinas-electric-vehicles-are-around-3-5-years-ahead-byd-ceo-says-2025-02-18/.

[71] *Ibid.*

[72] International Energy Agency, *Global EV Outlook 2024: Trends in electric cars*, March 2025, available at https://www.iea.org/reports/global-ev-outlook-2024/trends-in-electric-cars.

[73] Kennedy, S. Center for Strategic and International Studies, "The Chinese EV Dilemma: Subsidized Yet Striking," June 2024, available at https://www.csis.org/blogs/trustee-china-hand/chinese-ev-dilemma-subsidized-yet-striking.

[74] *Ibid.*

[75] Chang, A. and Bradsher, K., "How China Became the World's Largest Car Exporter," *The New York Times*, November 2024, available at https://www.nytimes.com/interactive/2024/11/29/business/china-cars-sales-exports.html.

[76] Zimmerman, M., Federal Reserve Bank of Boston, "A View of Recessions, from the Automotive Industry," *What Causes Business Cycles*, June 1998, available at https://www.bostonfed.org/-/media/Documents/conference/42/con42_20.pdf.

vehicles and parts are rapidly emerging, particularly in Europe and Southeast Asia.[77, 78, 79, 80, 81] Although American automotive manufacturers may make slight adjustments to their short-term priorities, it is clear that the longevity of these businesses is dependent upon investments in EVs. As such, it is clear that, despite recent policy-driven setbacks from the U.S. federal government, the shift to electrified transportation will continue and Michigan's utilities will need to be prepared to meet the continued demand from EV adoption growth.

Q. How will changes to EV technology, prices, and availability impact EV adoption?

A. The continued movement towards range and price parity will address the two most prevalent concerns that drivers have voiced about EVs - namely range anxiety and high upfront costs.[82] Today, the median range for internal combustion engine ("ICE") passenger

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[77] Kennedy, S., Center for Strategic and International Studies, "The Chinese EV Dilemma: Subsidized Yet Striking," June 2024, available at https://www.csis.org/blogs/trustee-china-hand/chinese-ev-dilemma-subsidized-yet-striking.

[78] Reuters, "China's electric vehicles are around 3-5 years ahead, BYD CEO says," February 2025, available at https://www.reuters.com/business/autos-transportation/chinas-electric-vehicles-are-around-3-5-years-ahead-byd-ceosays-2025-02-18/.

[79] Chang, A. and Bradsher, K., "How China Became the World's Largest Car Exporter," *The New York Times*, November 2024, available at https://www.nytimes.com/interactive/2024/11/29/business/china-cars-sales-exports.html.

[80] International Energy Agency, *Global EV Outlook 2024: Trends in electric cars*, March 2025, available at https://www.iea.org/reports/global-ev-outlook-2024/trends-in-electric-cars.

[81] Buchholz, K., "Chinese Car Exports Continue to Soar as EV Share Grows," *Forbes*, March 2024, available at https://www.forbes.com/sites/katharinabuchholz/2024/03/28/chinese-car-exports-continue-to-soar-as-ev-share-grows-infographic/.

[82] EV Charging Summit, "10 Biggest Challenges Facing the EV Industry Today," January 2023, available at https://evchargingsummit.com/blog/challenges-facing-the-ev-industry-today/.

vehicles is approximately 400 miles.[83] It is estimated that new EVs with a 400-mile range will reach price parity with their ICE counterparts between 2029 and 2033.[84] ICE vehicles and EVs with a lower range will reach price parity even sooner.[85]

Since 2024, several global automakers, including General Motors, Tesla, and Volkswagen, have announced that new, low-cost EV models can be expected to reach the market as early as late 2025.[86, 87, 88, 89] In June 2025, General Motors saw its monthly 2025 Chevy Equinox EV registrations surge by 722%.[90] Lauded as America's most affordable EV – starting at under $35,000 with a range of 315 miles – the success of the Equinox EV indicates that EVs will continue to grow in popularity as they become more affordable and as their ranges

[83] U.S. Department of Energy, "FOTW #1221, January 17, 2022: Model Year 2021 All-Electric Vehicles Had a Median Driving Range about 60% That of Gasoline Powered Vehicles," January 2022, available at https://www.energy.gov/eere/vehicles/articles/fotw-1221-january-17-2022-model-year-2021-all-electric-vehicles-had-median.

[84] Slowik, P. et al., International Council on Clean Transportation, *Assessment of light-duty electric vehicle costs and consumer benefits in the United States in the 2022–2035 time frame*, October 2022, available at https://theicct.org/publication/ev-cost-benefits-2035-oct22/.

[85] Andreoni, M., "The Electric Vehicle Future Is Coming. Just a Little More Slowly," *The New York Times*, September 2024, available at https://www.nytimes.com/2024/09/05/climate/electric-vehicle-sales-projections.html.

[86] Stoklosa, A., "The Super-Affordable 2027 Chevrolet Bolt EV Is Coming Soon—Very Soon," *Motortrend*, June 2025, available at https://www.motortrend.com/news/2027-chevrolet-bolt-everything-you-need-to-know.

[87] Banner, J., "The Cheap Tesla Is Almost Here—and We Finally Know What It'll Look Like," *Motortrend*, July 2025, available at https://www.motortrend.com/news/cheap-tesla-model-y-coming-2025.

[88] Jolly, J., "Can flood of cheap EVs coming to Europe save its carmakers?," *The Guardian*, December 2024, available at https://www.theguardian.com/business/2024/dec/31/can-flood-of-cheap-new-evs-coming-to-europe-save-european-carmakers.

[89] While the price of these new models will likely be impacted by the implementation of tariffs on essential components, like steel, aluminum, and lithium, these impacts will apply to all vehicles, not just EVs. *See for example* Egan, M., "Every car is about to get more expensive. 'It's just the math,' former Ford CEO says," *CNN Business*, April 2025, available at https://www.cnn.com/2025/04/03/business/car-prices-tariffs-trump#.

[90] Johnson, P., "The Chevy Equinox EV is flying off the lot after registrations surged 722% in June," *Electrek*, August 2025, available at https://electrek.co/2025/08/14/chevy-equinox-ev-flying-off-the-lot-registrations-surge/.

increase, in spite of political headwinds. Furthermore, in August 2025, Ford announced its new Universal EV Production System,[91] which will make the EV manufacturing process 40% faster than current methods and will use a new battery composition that is 30% cheaper than industry standard lithium-ion batteries.[92] In the same announcement, Ford revealed its plans to launch a mid-size pick-up truck with a starting price of $30,000 by 2027, which will be on par with current comparable ICE models.[93] This announcement clearly indicates that, federal obstacles notwithstanding, American automotive manufacturers are still committed to developing new offerings and streamlining their production processes, which will make EVs more affordable for drivers across the country.

In addition to the new car market, EV affordability will also improve due to growth of the used EV market, which is expected to grow in 2026 due to the number of leased EVs coming to the end of their lease terms.[94, 95] Lease-end vehicles are often sold at auctions, where used vehicle dealers purchase their inventory.[96] Reports show that EV leases rose

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[91] Ford Motor Company, "Ford's $5B Bet on America: Innovation Meets Efficiency in New EV Platform, Assembly Process and Midsize Truck," August 2025, available at https://www.fromtheroad.ford.com/us/en/articles/2025/ford-affordable-electric-vehicle-platform-midsize-electric-truck.

[92] White, J., "Ford's Answer to China: A Completely New Way of Making Cars," *Wired*, August 2025, available at https://www.wired.com/story/fords-answer-to-china-a-completely-new-way-of-making-cars/.

[93] *Ibid*.

[94] Toussaint, K., "The first big batch of used EVs will hit the market in 2026. No one knows what's going to happen," *Fast Company*, January 2024, available at https://www.fastcompany.com/91018102/the-first-big-batch-of-used-evs-will-hit-the-market-in-2026-no-one-knows-whats-going-to-happen.

[95] St. John, A., "Don't buy an EV — lease one instead. Here's why.," *Business Insider*, March 2023, available at https://www.businessinsider.com/ev-electric-car-lease-vs-purchase-buying-tips-cost-2023-2.

[96] Auto4Export, "Why Do Cars Go to Auction? Understanding the Reasons Behind Auto Auctions," December 2024, available at https://www.auto4export.com/blog/why-do-cars-go-to-auction-understanding-the-reasons-behind-auto-auctions.

from 8.6% of all EV sales at the beginning of 2023 to 23.9% at the end of the year.[97] In fact, according to a report from Experian, EVs accounted for over 20% of all new leases from 2024 to 2025.[98] Consequently, as two of the most significant barriers to EV adoption come down, new drivers that make up the early majority phase of adoption[99] will start to buy into the EV market.[100]

Q. What is the State of Michigan doing to enable EV adoption?

A. In December 2023, Governor Whitmer issued Executive Directive 2023-5 to transition the state's fleet to zero emission vehicles ("ZEVs"), stating that the state's LD vehicles must be converted to zero-emission alternatives by 2033 and MHD vehicles must be converted to ZEVs by 2040.[101] Executive Directive 2023-5 also directs the state to coordinate with higher education institutions and local units of government to assist these entities to

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[97] Toussaint, K., "The first big batch of used EVs will hit the market in 2026. No one knows what's going to happen," *Fast Company*, January 2024, available at https://www.fastcompany.com/91018102/the-first-big-batch-of-used-evs-will-hit-the-market-in-2026-no-one-knows-whats-going-to-happen.

[98] Experian Automotive, "State of the Automotive Finance Market Q2 2025," August 2025, available at https://www.experian.com/content/dam/noindex/na/us/automotive/finance-trends/experian-safm-q2-2025.pdf.

[99] Everett Rogers' diffusion of innovations theory explains the adoption of new concepts and technologies by creating consumer classifications based on what motivates them to accept the new idea or item and when they will adopt it for themselves. The main classifications identified in order of time to adoption are "innovators," "early adopters," "early majority," "late majority," and "laggards." Innovators make up 2.5% of the adopters, early adopters - 13.5%, early majority - 34%, late majority - 34%, and laggards - 16%. It is assumed that a product or idea has moved from niche to mainstream penetration once it is in the early majority adoption phase. *See* Halton, C., "Diffusion of Innovations Theory: Definitions and Examples," *Investopedia*, May 2025, available at https://www.investopedia.com/terms/d/diffusion-of-innovations-theory.asp; and On Digital Marketing, "The 5 Customer Segments of Technology Adoption," accessed July 2025, available at https://ondigitalmarketing.com/learn/odm/foundations/5-customer-segments-technology-adoption/.

[100] Thornton, T. and Teasdale, R., Baringa, "From early adopters to early majority: Driving the next phase of EV growth," March 2025, available at https://www.baringa.com/en/insights/low-carbon-futures/driving-next-phase-of-ev-growth/.

[101] Executive Office of the Governor, "Executive Directive 2023-5: Conversion of State Fleet," December 2023, available at https://www.michigan.gov/whitmer/news/state-orders-anddirectives/2023/12/05/executive-directive-2023-5-conversion-of-state-fleet.

transition to zero-emission fleets.[102] As of November 2023, there were 137,073 publicly owned vehicles across the state, including vehicles owned or leased by the state, counties, municipalities, or other local units of government.[103] Of those vehicles, 37,415 are classified as automobiles, 866 as buses, 97,987 as trucks, and 805 as motorcycles.[104]As of December 2024, there were 14,761 owned and leased vehicles in the State of Michigan's vehicle fleet alone, and nearly 95% were classified as LD while the remaining 5% were MHD vehicles.[105] In July 2024, the State of Michigan announced a partnership between Geotab Inc., a transportation solutions provider, and Wheels, a fleet management company, to provide telematics solutions that would help to prioritize the vehicles appropriate for electrification and identify operational efficiency opportunities.[106] The transition of the state fleet from ICE vehicles to EVs will represent considerable EV adoption growth in Michigan for which the state's utilities will need to plan for over the next decade.

[102] *Ibid.*

[103] U.S. Department of Transportation, Federal Highway Administration, "Highway Statistics 2022," February 2025, available at https://www.fhwa.dot.gov/policyinformation/statistics/2022/mv1.cfm.

[104] *Ibid.*

[105] Michigan Department of Technology, Management, and Budget, *2025 State of Michigan Fleet Plan*, December 2024, available at https://www.michigan.gov/dtmb/-/media/Project/Websites/dtmb/Law-and-Policies/Legislative-Reports/FY2025/2025-Fleet-Plan.pdf?rev=92dfd053e5514de3b3b081d2c357ce49&hash=66D77ECA9DDB57031EC46E63964CA4A1.

[106] Geotab Inc., "Michigan Selects Geotab and Wheels for Zero-Emission Fleet Initiative, Aligning with Executive Directive," July 2024, available at https://www.geotab.com/press-release/michigan-contract/.

Increasing access to and awareness of public charging infrastructure has also been shown to directly enable customers to purchase EVs.[107, 108, 109, 110] In addition to utility rebate programs, several state and federal funding programs are increasing access to charging infrastructure across Michigan. For example, in January 2025, the Michigan Department of Environment, Great Lakes, and Energy ("EGLE") launched the Clean Fuel and Charging Infrastructure ("CFCI") grant program to enable charging infrastructure deployment to multi-family housing, public, and fleet applications.[111] Separately, in June 2025, the Michigan Department of Transportation announced the awardees for its second round of National Electric Vehicle Infrastructure ("NEVI") program funds.[112] Increased flexibility in the NEVI program announced by the U.S. Department of Transportation in August 2025[113] could mean a more efficient deployment of program funds and supported charging

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[107] Osaka, S., The Washington Post, "For each public charger, here's how many EVs are looking to plug in," May 2024, available at https://www.washingtonpost.com/climate-solutions/2024/05/20/charging-stations-lag-ev-sales/.

[108] Center for Sustainable Energy, "The State of Electric Vehicle Adoption in the U.S. and the Role of Incentives in Market Transformation," September 2023, available at https://energycenter.org/thought-leadership/blog/stateelectric-vehicle-adoption-us-and-role-incentivesmarket#:~:text=Publicly%20available%20EV%20charging%20inspires,apartments%2C%20to%20charge%20an%2 0EV.

[109] U.S. Department of Energy, Alternative Fuels Data Center, "Charging Electric Vehicles in Public," June 2024, available at https://afdc.energy.gov/fuels/electricity-charging-public.

[110] International Energy Agency, "Global EV Outlook 2024: Moving towards increased affordability," 2024, available at https://iea.blob.core.windows.net/assets/a9e3544b-0b12-4e15-b407-65f5c8ce1b5f/GlobalEVOutlook2024.pdf.

[111] Department of Environment, Great Lakes, and Energy, "Clean Fuel and Charging Infrastructure Program," July 2024, available at https://www.michigan.gov/egle/about/organization/materials-management/energy/rfps-loans/clean-fuel-and-charging-infrastructure-program.

[112] Michigan Department of Transportation, "NEVI Round 2 Selections," June 2025, available at https://www.michigan.gov/mdot/-/media/Project/Websites/MDOT/Business/Contractors/Innovative-Contracting/NEVI---2/Notification-of-Selection.pdf?rev=6451b2352ab14cd2a84a075496f62c6f&hash=12DC631641D6A886192976DBDA00C8D8.

[113] Schwab, G., "Trump administration pledges to keep, streamline much-maligned EV charger program," *The Detroit News*, August 2025, available at https://www.detroitnews.com/story/business/autos/2025/08/11/trump-administration-pledges-to-keep-streamline-ev-charger-program/85611736007/.

stations. The operationalization of the state's NEVI-supported stations, coupled with the continued deployment of CFCI funding and utility rebates, will improve consumer visibility of new and existing charging opportunities throughout the state, instilling greater confidence that customers will be adequately supported if they purchase an EV.

C. EV IMPACTS ON LOAD

Q. How did the residential and commercial charging categories contribute to EV load across the Company's territory from April 2024 to March 2025?

A. The Company's 2025 TEP annual update notes that the residential and commercial charging categories accounted for approximately 55% and 45% of EV load respectively between April 2024 and March 2025.[114] Of the commercial charging load, over 30% came from charging at DCFC stations.[115] Notably, EV load from commercial charging saw a 50% increase between 2024 and 2025, which the Company attributes to the increased utilization of public DCFC across its service territory.[116] The Company assumes that approximately 67% of LD EVs will charge at a single designated L2 charger (nearly a 1-to-1 ratio) at a private residence or fleet location, while 33% will be dependent on public charging.[117] Nationally, 83% of charging occurs at home.[118] The difference between public charging in the Company's service territory and the national average (about 17%) suggests

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[114] Consumers Energy, "Transportation Electrification Plan Annual Progress Report 2025," Case No. U-21538, June 2025, p. 9.

[115] *Ibid*.

[116] *Ibid*.

[117] *Id*., p. 10.

[118] International Energy Agency, "Global EV Outlook 2024: Moving towards increased affordability," 2024, available at https://iea.blob.core.windows.net/assets/a9e3544b-0b12-4e15-b407-65f5c8ce1b5f/GlobalEVOutlook2024.pdf.

that a significant portion of the EV load in its territory is tied to EVs coming from outside its service territory to reach popular tourist destinations.[119]

Q. How will tourism impact EV load growth in the Company's electric service territory?

A. As previously noted, improvements to EV range and charging access will allow EV drivers to feel more comfortable taking their EVs on longer road trips. Witness Myrom notes that many popular Michigan tourist destinations, and the routes to get to them, reside in the Company's electric territory.[120] A report from the Michigan Economic Development Corporation found that over 131 million tourists visited Michigan in 2024,[121] an increase of nearly 3 million visitors from the previous year.[122] From 2021-2023, 36% of tourists visiting the west coast of the state came from the Chicago area.[123] Notably, EV registrations in Illinois rose by over 9,800 in the first quarter of 2025, which is a 50% increase, more than quadruple the national growth rate of 12% over the same period.[124] EV drivers coming to Michigan's most popular tourist destinations from outside the Company's electric

[119] Myrom Direct, p. 12.

[120] *Ibid*.

[121] Michigan Economic Development Corporation, *2024 Economic Impact of Visitors to Michigan*, June 2025, available at https://medc.app.box.com/s/3yta0ya66a7rt4s76fkjii5ax6day2i0.

[122] Moore, L., "Michigan welcomed a record-breaking number of visitors last year. See how they spent $29B," *MLive*, October 2024, available at https://www.mlive.com/life/2024/10/michigan-welcomed-a-record-breaking-number-of-visitors-last-year-see-how-they-spent-29b.html.

[123] Moore, L. and Levin, S., "Where are Michigan tourists coming from? See beachside rental data," *MLive*, July 2024, available at https://www.mlive.com/news/2024/07/where-are-michigan-tourists-coming-from-see-beachside-rental-data.html.

[124] Borras, J., "What EV sales slump? Illinois' EV sales outpace the nation by 4:1," *Elektrek*, April 2025, available at https://electrek.co/2025/04/06/what-ev-sales-slump-illinois-ev-sales-outpace-the-nation-by-41/.

territory will likely depend on DCFC to reach their destinations.[125] Consequently, increases to EV load are not only going to be driven by local EV adoption, but also, by tourists coming from outside the Company's service territory.

To meet this demand, a significant number of DCFC stations are expected to be energized between 2026 and 2030. As previously mentioned, the Michigan Department of Transportation announced its Round 1 selections for sites supported by the NEVI program in June 2024[126] and Round 2 selections were announced in June 2025. [127] Of the 84 total NEVI sites, two are complete, four are currently under construction (three of which are in the Company's service territory), 23 are in the design phase (13 of which are in the Company's service territory), and 53 have sites selected and are awaiting contracts (33 of which are in the Company's service territory).[128] The two currently operational sites are both in the Company's electric service territory – the first having come online in December

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[125] Blink Charging, "When should you use a DC Fast Charger," April 2025, available at https://blinkcharging.com/blog/when-should-you-use-a-dc-fast-charger.

[126] Michigan Department of Transportation, "NEVI Round 1 selection results," June 2024, available at https://www.michigan.gov/mdot/-/media/Project/Websites/MDOT/Business/Contractors/Innovative-Contracting/NEVI/Round-1-Notification-of-Selection.pdf?rev=179bc81b311441d490d04950775e6fe9&hash=302C7A01C202CF290C3FF8FD15AD82C8.

[127] Michigan Department of Transportation, "NEVI Round 2 selection results," June 2025, available at https://www.michigan.gov/mdot/-/media/Project/Websites/MDOT/Business/Contractors/Innovative-Contracting/NEVI---2/Notification-of-Selection.pdf?rev=6451b2352ab14cd2a84a075496f62c6f&hash=12DC631641D6A886192976DBDA00C8D8.

[128] Michigan Department of Transportation, "Michigan NEVI Project Status," accessed September 2025, available at https://experience.arcgis.com/experience/0f0eafe4cefe43a0adb8104d600d3cd3/page/Home/?views=Layers.

2024 in Lansing[129] and the second in 2025 in Grand Rapids. [130] Given the time between NEVI award selections and energization, it is reasonable to assume that many of these NEVI-supported DCFC stations will come online between the present day and 2030.

In addition to DCFC sites supported by the NEVI program, privately supported installations are also expected to contribute significantly to DCFC deployment growth across the state. For example, in November 2024, EVgo, a national charging provider, announced that it planned to expand its partnership with the grocery store company, Meijer, by deploying 480 new public fast chargers at Meijer properties across several states, including Michigan. [131] EVgo expects to open 30 new stations at Meijer stores by the end of 2026, and another 30 by the end of 2027. [132] This DCFC deployment growth aligns with the Company's expected DCFC service requests between 2025 and 2030. Assuming a utilization ratio of 85 EVs per one 250 kW DCFC, the company projects that it could receive "1,400-1,700 EV service requests of 1 MW or greater by 2030."[133]

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[129] Michigan Department of Transportation, "MDOT announces first fast charging station under NEVI program live in Lansing," December 2024, available at https://www.michigan.gov/mdot/news-outreach/pressreleases/2024/12/11/mdot-announces-first-fast-charging-station-under-nevi-program-live-in-lansing.

[130] Michigan Department of Transportation, "Michigan NEVI Project Status," accessed September 2025, available at https://experience.arcgis.com/experience/0f0eafe4cefe43a0adb8104d600d3cd3/page/Home/?views=Layers.

[131] EVgo Fast Charging, "EVgo and Meijer Expand Partnership to Install up to 480 New Fast Charging Stalls at Meijer Locations Across Midwest," November 2024, available at https://www.evgo.com/press-release/evgo-and-meijer-expand-partnership-to-install-up-to-480-new-fast-charging-stalls-at-meijer-locations-across-midwest/.

[132] *Ibid*.

[133] *Id*., p. 10.

Q. Are there additional considerations for load growth attributable to fleet MHD EV deployment in the Company's service territory?

LD EVs are reaching price parity and range parity with ICE vehicles faster than the MHD EV segment.[134, 135] As such, I expect that Michigan will continue to see more rapid growth in LD EV adoption.[136] However, because demand for charging is often more concentrated for fleet MHD EVs, that load may also be significant in the future.

In addition, the magnitude of EV adoption for both LD and MHD EV segments is expected to be far higher in existing population centers where electricity demand is already high.[137] For passenger vehicle drivers, this can be partly attributed to the more robust EV charging infrastructure in place within urban areas, as well as shorter driving distances to common places of interest, such as workplaces, doctor's offices, and grocery stores.[138, 139] In addition, the population density, coupled with the proximity to innovative industry leaders

[134] U.S. Department of Energy Vehicle Technologies Office, "FOTW #1354, August 5, 2024: Electric Vehicle Battery Pack Costs for a Light-Duty Vehicle in 2023 Are 90% Lower than in 2008, according to DOE Estimates," August 2024, available at https://www.energy.gov/eere/vehicles/articles/fotw-1354-august-5-2024-electric-vehicle-battery-pack-costs-light-duty.

[135] National Renewable Energy Lab (NREL), "Study Examines Cost Competitiveness of Zero-Emission Trucks," April 2024, available at https://www.nrel.gov/news/program/2024/study-examines-cost-competitivenessof-zero-emission-trucks.html.

[136] Energy Power Research Institute, Inc., "GridREADY: Preparing for EV Loads at Scale through Improved Planning, Prioritization, and Proactiveness," February 2025, available at https://epri.app.box.com/folder/311418861347.

[137] Energy Power Research Institute, Inc., "GridREADY: Preparing for EV Loads at Scale through Improved Planning, Prioritization, and Proactiveness," February 2025, available at https://epri.app.box.com/folder/311418861347.

[138] Sala, L. et al., "Generating demand responsive bus routes from social network data analysis," Transportation Research Part C: Emerging Technologies, 128 (2021), pp. 1-15, available at https://www.sciencedirect.com/science/article/abs/pii/S0968090X21002102.

[139] Higueras-Castillo, E. et al., "Voltage variations: Unraveling electric vehicle appeal in urban vs. rural areas," *Cities*, Vol. 159, April 2025, available at https://www.sciencedirect.com/science/article/pii/S0264275125001155#bb0305.

and start-ups, enables faster information sharing and diffusion of new innovations.[140] For MHD drivers, fleet depots and manufacturing sites are often collocated with local communities, transportation infrastructure, and a larger labor pool, and therefore are more often found near population centers.[141] Consequently, while LD EVs will be more widely dispersed across the state, their concentration, coupled with the concentration of MHD EV, will result in higher EV load where electricity demand is already high, emphasizing the need for strategic grid planning.

This is reflected in the Electric Power Research Institute's ("EPRI") eRoadmap GridReady tool, which indicates that a majority of electric load growth attributable to EVs is going to be concentrated in dense population centers and along freight corridors, such as around the Detroit, Lansing, and Grand Rapids areas.[142] And, of the top 10 counties projected to see the largest increases in EV electricity load, three – Kent, Ottawa, and Kalamazoo – are concentrated in the Company's service territory.[143, 144] EPRI reports that this will result in

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[140] Colvile, R., "Welcome to the 'Great Acceleration': how a faster world is helping to make us all richer," *Wired*, August 2016, available at https://www.wired.com/story/cities-lead-to-growth-speed-creativity/.

[141] Steele, C.W. et al., "Background Research Material for Freight Facility Selection: A Guide for Public Officials (NCFRP Report 13)," Chapter 5: The Location Selection Process, May 2011, available at https://nap.nationalacademies.org/read/22862/chapter/9.

[142] Electric Power Research Institute (EPRI), "eRoadmap GridReady," accessed July 2025, available at https://eroadmap.epri.com/.

[143] Energy Power Research Institute, Inc., "GridREADY: Preparing for EV Loads at Scale through Improved Planning, Prioritization, and Proactiveness," February 2025, available at https://epri.app.box.com/folder/311418861347.

[144] Energy Power Research Institute, Inc., "eRoadMAP," accessed July 2025, available at https://eroadmap.epri.com/.

12,000 MWh in daily load growth attributable to EVs across the state, less than 2,000 MWh of which will come from MHD EVs.[145]

However, while MHD EV adoption and attributed load is relatively low today, the upgrade requirements to support this scale of concentrated adoption will require time and careful planning on the part of the state's utilities.[146] This is because, depending on the vehicle type, battery size, and type of charging, a single MHD EV can require 0.4-1.0 MWh to get to a full state of charge.[147, 148] A fleet operator with between 10 and 100 MHD EVs in its fleet could require anywhere from 10 to 100 MWh of energy to support its daily operations,[149] and depending on when that charging occurs, this could require significant distribution system and substation upgrades. A 2021 study from the National Renewable Energy Lab found that when short-haul heavy-duty fleets actively participated in smart or managed charging programs, 90% of the 36 substations were able to fully supply those fleets without distribution system upgrades.[150] Consequently, preparing for increased MHD vehicle electrification will require strategic planning and implementation of managed charging programs.

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[145] Energy Power Research Institute, Inc., "GridREADY: Preparing for EV Loads at Scale through Improved Planning, Prioritization, and Proactiveness," February 2025, available at https://epri.app.box.com/folder/311418861347.

[146] *Ibid.*

[147] Freightliner, "You Asked, We Answered: Electric Truck FAQs," accessed July 2025, available at https://www.freightliner.com/blog-and-newsletters/electric-truck-faqs/.

[148] Kane, M., "Tesla Launches 1,000-Volt Powertrain: Semi Is First But Not The Last," December 2022, available at https://insideevs.com/news/624822/tesla-1000volt-powertrain-semi-first/.

[149] National Renewable Energy Laboratory, "Researchers Identify Near-Term Opportunity for Heavy-Duty Electric Trucks," June 2021, available at https://www.nrel.gov/news/detail/program/2021/researchers-identify-near-term-opportunities-for-heavy-duty-trucks.

[150] *Ibid.*

D. IMPLICATIONS OF EV ADOPTION FOR THE COMPANY AND ITS CUSTOMERS

Q. What is the value of enabling EV adoption in the Company's service territory?

A. As previously stated, experts assert that the existence of public charging infrastructure directly enables customers to purchase EVs,[151, 152, 153, 154] leading to significant at-home charging and revenue from electricity sales.[155, 156, 157, 158, 159] In its 2025 TEP, the Company

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[151] Osaka, S., The Washington Post, "For each public charger, here's how many EVs are looking to plug in," May 2024, available at https://www.washingtonpost.com/climate-solutions/2024/05/20/charging-stations-lag-ev-sales/.

[152] Center for Sustainable Energy, "The State of Electric Vehicle Adoption in the U.S. and the Role of Incentives in Market Transformation," September 2023, available at https://energycenter.org/thought-leadership/blog/stateelectric-vehicle-adoption-us-and-role-incentivesmarket#:~:text=Publicly%20available%20EV%20charging%20inspires,apartments%2C%20to%20charge%20an%2 0EV.

[153] U.S. Department of Energy, Alternative Fuels Data Center, "Charging Electric Vehicles in Public," June 2024, available at https://afdc.energy.gov/fuels/electricity-charging-public.

[154] International Energy Agency, "Global EV Outlook 2024: Moving towards increased affordability," 2024, available at https://iea.blob.core.windows.net/assets/a9e3544b-0b12-4e15-b407-65f5c8ce1b5f/GlobalEVOutlook2024.pdf.

[155] Nadel, S., American Council for an Energy-Efficient Economy (ACEEE), "Charging Ahead: How EVs Could Drive Down Electricity Rates," January 2024, available at https://www.aceee.org/blog-post/2024/01/charging-ahead-how-evs-could-drive-down-electricity-rates.

[156] Metz, L. et al., Synapse Energy Economics, Inc., "Distribution System Investments to Enable Medium- and HeavyDuty Vehicle Electrification: A Case Study of New York," April 2023, available at https://acrobat.adobe.com/id/urn:aaid:sc:US:3ef62d18-a652-4848-a2a5-15eb2771d8cc.

[157] Synapse Energy Economics, Inc., "Are Driving Rates Down for All Customers: State-by-State Cumulative EV Net Rate Impact Summary," June 2024, available at https://www.synapse-energy.com/sites/default/files/EV%20All%20State%20List%20PDF_0.pdf.

[158] Satchwell, A. et al., Prepared for the U.S. Department of Energy, "Quantifying the Financial Impacts of Electric Vehicles on Utility Ratepayers and Shareholders," February 2023, available at https://etapublications.lbl.gov/sites/default/files/ev_financial_impacts_final_report_final_draft_02092023.pdf.

[159] California Public Utilities Commission, "Utility Cost and Affordability of the Grid of the Future: An Evaluation of Electric Costs, Rates, and Equity Issues Pursuant to P.U. Code Section 913.1. 2021," available at https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/office-of-governmental-affairs-division/reports/2021/senate-bill-695-report-2021-and-en-bancwhitepaper_final_04302021.pdf.

indicates that TEP customer load management programming costs will amount to approximately $113 million between 2025 and 2031. While this does not include costs to upgrade the distribution system to meet increased EV load, the cost of the TEP program investments is drastically offset by the over $755 million in rate relief, netting approximately $642 million for all customers in the Consumers service territory between 2025 and 2031.[160]

Similar impacts have been observed in other states. For example, in a Synapse Energy Economics study, from 2012 - 2019, California utilities Pacific Gas and Electric ("PG&E") and Southern California Edison ("SCE") managed EV programs of about $220 million and $150 million, respectively.[161, 162] This encouraged EV adoption, leading to increased revenue from charging amounting to nearly $700 million in PG&E's territory and $500 million in SCE's territory.[163, 164] Synapse Energy Economics conducted a follow-up study of other utilities in 2024, examining the revenues attributable to EV charging and the marginal generation, transmission, and distribution costs of providing electricity to EVs

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[160] Foley, N., CONSUMERS Electric Company, "CONSUMERS Electric Transportation Electrification Plan - Filed," Exhibit A29, Schedule S1, April 2025, available at https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068cs00000lnYS8AAM.

[161] Alliance for Transportation Electrification and Plug In America, *The Missing Piece on Meeting Transportation Electrification Goals: Utility Education and Outreach Programs*, December 2020, available at https://evtransportationalliance.org/wp-content/uploads/2021/11/2020-Education-Outreach-White-Paper.pdf.

[162] Frost, J. et al., Synapse Energy Economic, Inc. "Electric Vehicles Are Driving Electric Rates Down," June 2020, available at https://www.synapse-energy.com/sites/default/files/EV_Impacts_June_2020_18-122.pdf.

[163] Alliance for Transportation Electrification and Plug In America, *The Missing Piece on Meeting Transportation Electrification Goals: Utility Education and Outreach Programs*, December 2020, available at https://evtransportationalliance.org/wp-content/uploads/2021/11/2020-Education-Outreach-White-Paper.pdf.

[164] Frost, J. et al., Synapse Energy Economic, Inc. "Electric Vehicles Are Driving Electric Rates Down," June 2020, available at https://www.synapse-energy.com/sites/default/files/EV_Impacts_June_2020_18-122.pdf.

between 2011 and 2021. It found that EV drivers have contributed about $18 million more than their associated system costs in each of Illinois[165] and Virginia,[166] $26.7 million more in Colorado,[167] and $85.3 million more in New Jersey.[168] Consequently, as utilities continue to invest in EV programs, the resultant increased EV adoption actually leads to downward rate pressure for all ratepayers.[169]

In addition, EV deployment represents an opportunity to maximize the benefits of EVs in service to the local distribution system. For the grid-operator, the deployment and use of bidirectional-capable EVs and EV chargers creates an available resource to balance grid conditions and allows utilities to defer investment in other more intensive grid-scale operations.[170] According to a study by EPRI, California's current frequency regulation market could be fully served by only around 100,000 vehicle-to-grid ("V2G")-enabled

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[165] Shenstone-Harris, S. et al., Synapse Energy Economics, Inc., "Electric Vehicles are Driving Rates Down for All Customers, State Factsheet: Illinois," April 2024, available at https://www.synapse-energy.com/sites/default/files/Electric%20Vehicles%20Are%20Driving%20Rates%20Down%20for%20All%20Customer%20Illinois%20May%202024.pdf.

[166] Shenstone-Harris, S. et al., Synapse Energy Economics, Inc., "Electric Vehicles are Driving Rates Down for All Customers, State Factsheet: Virginia," April 2024, available at https://www.synapse-energy.com/sites/default/files/Electric%20Vehicles%20Are%20Driving%20Rates%20Down%20for%20All%20Customer%20Virginia%20May%202024%2024-023.pdf.

[167] Shenstone-Harris, S. et al., Synapse Energy Economics, Inc., "Electric Vehicles are Driving Rates Down for All Customers, State Factsheet: Colorado," April 2024, available at https://www.synapseenergy.com/sites/default/files/Electric%20Vehicles%20Are%20Driving%20Rates%20Down%20for%20All%20Cus tomer%20Colorado%20May%202024.pdf.

[168] Shenstone-Harris, S. et al., Synapse Energy Economics, Inc., "Electric Vehicles are Driving Rates Down for All Customers, State Factsheet: New Jersey," April 2024, available at https://www.synapseenergy.com/sites/default/files/Electric%20Vehicles%20Are%20Driving%20Rates%20Down%20for%20All%20Cus tomer%20New%20Jersey%20April%202024.pdf.

[169] Frost, J. et al., Synapse Energy Economic, Inc. "Electric Vehicles Are Driving Electric Rates Down," June 2020, available at https://www.synapse-energy.com/sites/default/files/EV_Impacts_June_2020_18-122.pdf.

[170] Michigan Energy Innovation Business Council and Clean Fuels Michigan, *Transportation Electrification in Michigan: A Roadmap to State Policy Actions*, October 2024, available at https://www.mieibc.org/wp-content/uploads/2024/10/Transportation-Electrification-in-Michigan.pdf.

EVs, which is a fraction of the state's goal of 5 million EVs by 2030.[171] The same study found an annual relative savings of between $407 and $1,018 per customer for ratepayers with V2G-enabled EVs.[172] Customers in California's San Diego County school district saw these benefits during a 10-day 2022 heat wave, during which the school district was able to send energy back to the grid and power 452 homes every day.[173, 174] Given the grid reliability challenges faced in Michigan that are identified in the Commission's audit of DTE Electric and Consumers Energy,[175, 176, 177, 178, 179] EVs represent a largely untapped grid resource that would benefit ratepayers and energy providers alike.

[171] Chhaya, S. Electric Power Research Institute, "Open Standards-Based Vehicle-to-Grid: Value Assessment," June 2019, available at https://www.epri.com/research/products/000000003002014771.

[172] *Ibid.*

[173] CalMatters, "Here's how California's electric cars can feed the grid and help avoid outages," September 2023, available at https://calmatters.org/environment/2023/07/california-electric-cars-bidirectional-charging/.

[174] Sheja, C., Center for Sustainable Energy, "Grid Integration of EV Batteries Can Benefit Drivers and Energy Providers," February 2024, available at https://energycenter.org/thought-leadership/blog/grid-integration-ev-batteries-can-benefit-drivers-and-energy-providers.

[175] Michigan Public Service Commission, "MPSC releases utility audit results of state's two largest electric utilities, data that will help improve reliability in Michigan," September 2024, available at https://www.michigan.gov/mpsc/commission/news-releases/2024/09/23/mpsc-releases-utility-audit-results-of-states-two-largest-electric-utilities.

[176] Citizens Utility Board, "The Grid Audit of CONSUMERS and Consumers Energy: Some Early Takeaways," October 2024, available at https://cubofmichigan.org/blog/the-grid-audit-of-Consumers-and-Consumers-energy-some-early-takeaways/.

[177] Walton, R., "Michigan regulators order reliability improvements for Consumers Energy, CONSUMERS," *Utility Dive*, June 2025, available at https://www.utilitydive.com/news/michigan-regulators-order-reliability-improvements-Consumers-Consumers/750769/.

[178] White, E., "Northern Michigan — no stranger to wild weather — tries to cope with days of no power," *AP News*, April 2025, available at https://apnews.com/article/michigan-ice-storm-power-outages-4807b995fd4f9acbe1cdc7715e2bbaef.

[179] Rappleye, L., "Up North residents hit by ice storm endure cold, power outages: 'How are we gonna manage?'," *Detroit Free Press*, April 2025, available at https://www.freep.com/story/news/local/michigan/2025/04/14/northern-michigan-ice-storm-power-outage-up-north/83070910007/.

Q. Why is proactive planning important for utilities when it comes to preparing for increased EV load growth?

A. Proactive planning for EV adoption can save utilities and ratepayers in the long run.[180,181] A 2024 study found that proactive grid maintenance and upgrades in response to increased EV load growth resulted in about $20 million in savings compared to reactive upgrades in Con Edison's territory (New York City and Westchester County, NY), and $10-13 million in savings in CenterPoint's service territory (Houston, TX).[182] Additionally, models from the same study showed that even in the lowest EV adoption scenario, an "all proactive" upgrade approach still yielded higher savings than a mixed proactive and reactive approach.[183] This suggests that overestimating, and subsequently upgrading to meet EV load growth carries limited risk.[184]

Utility TEPs and distribution system plans are critical, informative tools to ensure that the Company is effectively able to predict, plan, and execute necessary distribution system

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[180] Black & Veatch, "Pro-Active Grid Investment Assessment: Medium- and Heavy-Duty Vehicle Transportation Electrification," November 2024, available at https://library.edf.org/AssetLink/1sf1n64na1m7b636rs127w4wqvs11d4e.pdf?_gl=1*14rezcp*_gcl_au*MjczNzI5MDQ0LjE3NTM3MTg4MDQ.*_ga*NzAxMjcwMzkzLjE3NTM3MTg4MDQ.*_ga_2B3856Y9QW*czE3NTM3MTg4MDMkbzEkZzEkdDE3NTM3MTg5OTUkajQ4JGwwJGgw.

[181] Sahoo, A. et al., BCG, "The Costs of Revving Up the Grid for Electric Vehicles," December 2019, available at https://web-assets.bcg.com/img-src/costs-revving-up-the-grid-for-electric-vehicles_tcm9-236324-64_tcm9-237341.pdf.

[182] Black & Veatch, "Pro-Active Grid Investment Assessment: Medium- and Heavy-Duty Vehicle Transportation Electrification," November 2024, available at https://library.edf.org/AssetLink/1sf1n64na1m7b636rs127w4wqvs11d4e.pdf?_gl=1*14rezcp*_gcl_au*MjczNzI5MDQ0LjE3NTM3MTg4MDQ.*_ga*NzAxMjcwMzkzLjE3NTM3MTg4MDQ.*_ga_2B3856Y9QW*czE3NTM3MTg4MDMkbzEkZzEkdDE3NTM3MTg5OTUkajQ4JGwwJGgw.

[183] *Ibid.*

[184] *Ibid.*

upgrades to meet future load growth attributable to EVs.[185, 186, 187] More specifically, customer engagement driven by education and outreach programs, as well as customer enrollment in rebate and TOU rates, can inform utilities of EV penetration trends in their service territories and where load growth is expected. Delaying upgrades or artificially reducing projected load growth risks impairing utilities' visibility into future EV-related load growth, potentially resulting in suboptimal upgrade decisions, longer energization timelines for new load, and grid constraints. In other words, while postponing upgrades required to meet EV adoption growth may yield short-term savings, the long-term financial and operational liabilities, as well as customer service impacts, could be far greater.

E. GRID UPGRADES TO MEET DCFC LOAD

Q. What does witness Myrom say about TOU rates and their effectiveness in managing future load?

A. Witness Myrom highlights the success that the Company has had in optimizing its EV load growth through TEP engagement, achieving nearly 95% off-peak charging among customers enrolled in its residential TOU program.[188] However, witness Myrom notes that

> in late 2023 the Company's AMI data analysis showed just 493 of the 30,380 EVs enrolled in Rate 1050 (Nighttime Savers) without TEP rebate or incentive engagement, which equates to a mere 1.6% of EV

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[185] Morash, S., Lawrence Berkeley National Laboratory, "Charging Ahead: Grid Planning for Vehicle Electrification," January 2024, available at https://www.esig.energy/wp-content/uploads/2024/01/ESIG-Grid-Planning-Vehicle-Electrification-report-2024.pdf.

[186] Shapiro, B. and Pesta, N., RMI, "Six Building Blocks to Prepare the Grid for EVs," October 2024, available at https://rmi.org/six-building-blocks-to-prepare-the-grid-for-evs/.

[187] Taylor, P., American Public Power Association, "Proactive Grid Build for Transportation Electrification," January 2025, available at https://www.publicpower.org/resource/proactive-grid-build-transportation-electrification.

[188] Myrom Direct, p. 5.

> customers. Again, in late 2024, advanced metering infrastructure ("AMI") data analysis indicated just 526 of 39,950 EVs enrolled in Rate 1050 without TEP program engagement, which is 1.3% of EV customers.[189]

This indicates a strong positive correlation between customers participating in the TEP rebate programs and shifting their charging behavior to align with utility TOU rates. As such, TEP rebate programs are critical to ensuring EV customers are charging during off-peak hours. However, given the low enrollment in Rate 1050, it is also clear that, under the current education and outreach efforts, relying on TOU rates alone to optimize grid load is not an effective long-term strategy to manage EV load, especially as adoption continues to increase.[190]

Q. What impact will DCFC deployment have on EV load growth?

A. While continued development and promotion of the TEP L2 and L1 programs will help to optimize grid load for residential program participants, as previously noted, the Company anticipates a significant number of DCFC installations for public and fleet applications to be deployed in its electric service territory in the next five years. According to witness Myrom, assuming a utilization ratio of 85 EVs per one 250 kW DCFC, the company projects that it could receive "1,400-1,700 EV service requests of 1 MW or greater by 2030."[191] Company witness Jennifer Partlan also discusses the impact of new business load, including from DCFC deployment, on the low-voltage distribution system, which she

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[189] *Id.*, p. 10.

[190] *Ibid*.

[191] *Id.*, p. 10.

indicates will require significant proactive planning to ensure demand can be met without sacrificing system reliability.

Q. Are there innovative ways for the Company to meet EV load growth while deferring distribution system upgrade costs?

A. Yes, as noted by witness Partlan, upgrading the distribution system to meet new business load, such as from DCFC installations, will be costly. To avoid or defer some of these costs while still meeting EV load growth, the Company could look, for example, to enable flexible energization. Broadly, flexible energization refers to the ability of a large-load consumer to adapt its energy consumption in response to shifts in energy supply, demand, or pricing.[192] In a flexible energization agreement, customers connecting a large load agree to energy consumption terms with the utility that would limit energy use based either on currently available grid capacity or on predetermined times to mitigate grid strain.[193] Customers could also agree to stagger load energization and unlock full service for the required load over time.[194] If, for example, a fleet operator requires 10 MW of additional daily load but the current grid capacity will only support 1 MW of new load, the customer and the utility could agree to a timeline whereby 1 MW of the customer's demand could be fulfilled immediately and the rest would be made available over time as the utility makes necessary upgrades. Flexible energization methods

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[192] GridX, "Energy Flexibility," September 2025, available at https://www.gridx.ai/knowledge/what-is-energy-flexibility.

[193] United States Department of Energy, "Flexible DER & EV Connections," July 2024, available at https://www.energy.gov/sites/default/files/2024-08/Flexible%20DER%20%20EV%20Connections%20July%202024.pdf.

[194] *Ibid*.

> improve distribution system utilization allowing more distributed energy resource ("DER") interconnections and service connections for EV charging while lowering the cost of integration…The potential benefits of flexible connections include …facilitat[ing] higher DER and EV adoption, lowering connection costs, and/or deferring infrastructure upgrades. Flexible [energization] methods can be applied in various scenarios, serving as a temporary or a more permanent solution. In a temporary context, flexible [energization methods] enable distributed generation, battery projects, and large EV charging centers (e.g., fleet charging and public charging locations) to connect more quickly, bridging the gap until scheduled distribution reinforcements are completed. Alternatively, it can be a longer-term solution until other proposed DER/EV charging loads create the need for an upgrade.[195]

According to the U.S. Department of Energy, detailed hosting capacity analyses and dynamic operating assessments are critical to standing up successful flexible energization programs.[196, 197] Examples of existing flexible energization programs include:

- *California Pacific Gas & Electric ("PG&E") Flex Connect* – Customers wishing to connect large loads to the distribution system agree to limit energy usage during peak periods to be connected to the grid more quickly.[198]
- *Southern California Edison ("SCE") Load Control Management System ("LCMS") Pilot* – The LCMS pilot program allows customers to use energy based on currently

[195] *Ibid*.

[196] *Ibid*.

[197] Hosting capacity analyses typically offer a general overview of peak load scenarios and assume a steady state when considering DER integration. Dynamic operating assessments establish load capacity limits based on specific times to determine how much energy is available to import (or export) based on forecasts and real-time grid conditions. *See* United States Department of Energy, "Flexible DER & EV Connections," July 2024, available at https://www.energy.gov/sites/default/files/2024-08/Flexible%20DER%20%20EV%20Connections%20July%202024.pdf.

[198] Lohse, J., Ampcontrol, "Flex Connect: PG&E's Game-Changer for EV Charging and Grid Connections," December 2024, available at https://www.ampcontrol.io/post/pg-es-flex-connect-program-a-game-changer-for-ev-charging-and-grid-connections.

available grid capacity.[199] The LCMS can automatically reduce or stop power to EV chargers, or other devices, to avoid overloading the local grid.[200]

By implementing a flexible energization pilot program similar to PG&E's Flex Connect or SCE's LCMS, the Company could energize new load to support DCFC installation or fleet depot charging without overloading the distribution system and spread out costs to upgrade the local grid over time.

F. TEP PROGRAM ENHANCEMENTS

Q. Please describe the Company's existing public DCFC rebate.

A. The Company's DCFC rebate is a continuation of the Company's customer projects from the PowerMIDrive pilot phase of the EV initiatives. In its 2024 TEP, the Company reported that 61 of the 137 DCFC sites supported by PowerMIDrive were operational.[201] Between 2024 and 2025, an additional 27 sites were energized in the Company's service territory.[202] In Case No. U-21585, the Commission approved the Company's request to set its public DCFC rebate to $50,000 per port,[203] a decrease from the previously approved rebates of

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[199] United States Department of Energy, "Flexible DER & EV Connections," July 2024, available at https://www.energy.gov/sites/default/files/2024-08/Flexible%20DER%20%20EV%20Connections%20July%202024.pdf.

[200] *Ibid*.

[201] Consumers Energy, "Transportation Electrification Plan 2024," Case No. U-21538, June 2024, available at https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y00000EFQgtAAH.

[202] Consumers Energy, "Transportation Electrification Plan Annual Progress Report 2025," Case No. U-21538, June 2025, p. 24.

[203] Michigan Public Service Commission, Case No. U-21585 Order, March 2025, p. 204.

$70,000.[204] In the current case, witness Myrom notes that "the median and average costs of a 150 kW DCFC construction project range between approximately $200,000 and $237,000."[205] In its 2024 TEP annual update, the Company indicates that make-ready costs range from $30,608 to $45,509 (about 13-23% of total project costs) while construction costs[206] typically range from $191,239 to $199,262.[207] Additionally, site hosts can get support from other incentives, such as the federal 30C Vehicle Refueling Property Tax Credit ("30C tax credit"),[208] which can reduce project costs by 30%, bringing project costs down to $140,000-$166,000.[209] If a site host claims the 30C tax credit, the Company's $50,000 DCFC rebate would cover about one-third of the total project costs, or the entirety of the make-ready costs, for a two-port DCFC installation.[210] With the repeal of the Inflation Reduction Act, however, the 30C tax credit will sunset on June 30, 2026.[211, 212,]

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204 *Id*., p. 196.

205 Myrom Direct, p. 13.

206 In its 2024 TEP annual update, the Company indicates that construction costs include installation, network and maintenance plan fees, and charging station equipment. *See* Consumers Energy, "Transportation Electrification Plan 2024," Case No. U-21538, June 2024, available at https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y00000EFQgtAAH.

207 *Ibid*.

208 United States Department of Energy, "Alternative Fuels Data Center: Alternative Fuel Infrastructure Tax Credit," Accessed September 2025, available at https://afdc.energy.gov/laws/10513.

209 Myrom Direct, p. 13.

210 *Ibid*.

211 Evergreen Action, "Republican Megabill Is a Disaster for Energy Costs, Jobs, and Clean Energy," June 2025, available at https://www.evergreenaction.com/blog/senate-gops-updated-megabill-is-still-a-disaster-for-affordability-jobs-and-clean-energy.

212 *The Business Times*, "Tesla braces for rough quarters ahead as US ends EV incentives," July 2025, available at https://www.businesstimes.com.sg/companies-markets/transport-logistics/tesla-braces-rough-quarters-ahead-us-ends-ev-incentives.

[213] Consequently, prospective site hosts now have less than a year to plan a site and apply for the 30C tax credit.

Without the 30C tax credit, while the proposed rebate of $50,000 per 150 kW port will likely still cover a majority of the make-ready costs, the applicant will need to pay approximately $75,000 to $93,500 per port in construction costs. Even with the Company's $50,000 rebate, this cost increase could make it more difficult to establish a workable business case for DCFC investments, especially in rural and seasonal travel communities where charging is most needed.

In a discovery response (Exhibit MEIU-1.3), witness Myrom indicates that "the goal of the temporary DCFC rebate program is to spur the growth of quality fast charging infrastructure and to do so as quickly as possible." Reaching rural and seasonal travel communities, however, remains a challenge. In its TEP 2025 annual update, the Company indicates that "rural and seasonal travel communities still need incentive support to ensure the skeleton network of fast chargers is sufficient to support rapidly growing EV adoption."[214]

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[213] United State Internal Revenue Service, "FAQs for modification of sections 25C, 25D, 25E, 30C, 30D, 45L, 45W, AND 179D under Public Law 119-21, 139 Stat. 72 (July 4, 2025), commonly known as the One, Big, Beautiful Bill Act (OBBB)," August 2025, Accessed September 2025, available at https://www.irs.gov/newsroom/faqs-for-modification-of-sections-25c-25d-25e-30c-30d-45l-45w-and-179d-under-public-law-119-21-139-stat-72-july-4-2025-commonly-known-as-the-one-big-beautiful-bill-act-obbb.

[214] Consumers Energy, "Transportation Electrification Plan Annual Progress Report 2025," Case No. U-21538, June 2025, p. 24.

Q. What are the Company's proposed "enhancements" to its TEP programs?

A. In the instant case, the Company proposes its L2 and L1 rebates be approved to apply to NEMA 14-50 and NEMA 5-20 outlets, respectively.[215] The Company proposes the following related to its DCFC rebate:[216]

- *Rebate amount* – The Company proposes a DCFC rebate of up to $50,000 per 150 kW port, with a limit of up to four ports;
- *Geographical limitation* – The Company suggests that the DCFC rebate only be available to communities that have no more than four 150 kW DCFC ports in two or more locations;
- *Time limitation* – Assuming the Commission approves the Company's proposal in the order for the current case, Consumers recommends that the DCFC rebate only be available for two years after approval; and
- *Selection criteria* – The Company proposes several criteria by which it could evaluate DCFC rebate applications on a rolling basis. The Company notes that sites meeting these criteria would be given preference over those that do not. These criteria include:[217]
    - *Access to charging and amenities* (e.g. restrooms and food options) – Applications for sites with 24/7 access to charging and amenities would be given preference over those that do not;

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[215] Myrom Direct, pp. 12-13.

[216] *Id.*, pp.13-15.

[217] *Id.*, pp. 14-15.

- *Visibility* – Applications for sites that are clearly visible from the road and that have signage to direct drivers would be given preference over those that do not;
- *Payment options* – Applications for DCFC that accept credit card or phone tap options, as opposed to being limited by requiring use of a specific phone application, would be given preference over those that do not;
- *Open design concept* – Applications for sites that can serve multiple vehicle types and sizes would be given preference over those that do not; and
- *Overhead coverage* – Applications for sites with a canopy would be given preference over those that do not.[218]

The Company also proposes two requirements for DCFC rebate applicants:[219]

- *Safety* – DCFC sites must include security lighting for an application to be considered; and
- *Number of ports* – Applications for DCFC sites must include at least two 150 kW DCFC ports. Sites offering more than two ports would also be given preference, with a maximum of four rebates available per site host.

[218] In his outline of proposed TEP enhancements in direct testimony, witness Myrom discusses canopy coverage in conjunction with security lighting, stating that "the host site must have adequate security lighting and preferably a canopy." *See* Myrom Direct, pp. 14-15. In a discovery response (Exhibit MEIU-1.3), witness Myrom clarifies that while discussed with a proposed requirement, a canopy is not required.

[219] *Ibid*.

Q. What reasons does the Company provide for the proposed modifications to its L2 and L1 rebate programs?

A. The Company indicates that allowing L2 and L1 rebates to apply to NEMA 14-50 and 5-20 outlet installation costs will allow more flexibility to address customers' specific needs.[220] Witness Myrom notes that because

> many new EVs come with, and existing EV drivers utilize, a portable charger, focusing a project on the outlet can simplify installations and reduce costs for host sites… Presently only community charging host sites can utilize outlets as a [Bring Your Own Charger] option, and the Company believes that it is a useful option across the board to reduce infrastructure costs.[221]

The Company also suggests that this option would be particularly attractive for MFH properties due to the higher infrastructure costs required to make them EV-ready.[222]

Q. Do you agree with the Company's proposed modifications to its L2 and L1 rebate programs?

A. Not entirely. While this recommendation would allow flexibility in the program to suit the customer's specific needs and reduce the customer's make-ready costs, it is unclear how the Company plans to ensure that a customer with a NEMA 14-50 or 5-20 outlet will actually purchase the charger and participate in the TOU rate or any future managed charging program. As detailed in MEIU witness Dr. Laura Sherman's testimony in Case No. U-21297 (DTE Electric Company's 2023 general electric rate case),

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[220] *Id.*, pp. 12-13.

[221] *Ibid.*

[222] *Ibid.*

> if a customer chooses to install a NEMA 14-50 outlet (instead of directly installing an EV charger), there should be a procedural assurance that the customer actually acquires an EV charger to participate in the program (e.g., by the provision of a receipt or invoice to the Company). Without verification, a customer could be participating in the program and receive a NEMA 14-50 outlet installation but not utilize the outlet for EV charging.[223]

As such, the Commission should require the Company to ensure that if a customer chooses to install a NEMA 14-50 outlet, that they also purchase or obtain an EV charger or charging cord and provide proof of EV purchase or lease.

Q. What reasons does the Company provide for the proposed modifications to its DCFC rebate program?

A. The Company suggests that modifying the DCFC rebate program, as discussed above, will ensure that awarded rebates maximize the benefits of the DCFC installation to EV drivers, site hosts, and the local community (Exhibit MEIU-1.3). Witness Myrom points to the availability of other incentives, such as the 30C Vehicle Refueling Property Tax Credit,[224] that site hosts would be able to apply for to further reduce costs to justify the proposed modification to the DCFC rebate amount.[225] However, as previously stated, the 30C tax credit will sunset on June 30, 2026. Consequently, this should not be factored into consideration when evaluating the impact of the DCFC rebate on DCFC installation costs for public site hosts.

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[223] Direct Testimony of Dr. Laura Sherman on behalf of the Michigan Energy Innovation Business Council, Institute for Energy Innovation, and Advanced Energy United, Case No. U-21297, p. 16.

[224] United States Department of Energy, "Alternative Fuels Data Center: Alternative Fuel Infrastructure Tax Credit," Accessed September 2025, available at https://afdc.energy.gov/laws/10513.

[225] Myrom Direct, p. 13.

In addition, the Company suggests that limiting the geographical eligibility will drive rebate applications in communities that do not yet have DCFC infrastructure, as opposed to supporting build-out in areas that already have infrastructure in place.[226] Finally, the Company indicates, given the competitive nature of applications for EV charging funding in the limited TEP budget, the proposed criteria to evaluate applications will ensure that the best sites and projects are selected to receive rebates.[227]

Q. Does the Company explain how it proposes to evaluate DCFC rebate applications?

A. In a discovery response (Exhibit MEIU-1.3), witness Myrom indicates that the Company would review applications and award rebates on a monthly basis and that the Company would make a "yes/no" determination for each criterion to determine whether to award funding to an applicant. An applicant would have to meet the minimum criteria (i.e., the site must have security lighting and at least two 150 kW DCFC ports) to be eligible for any program funding (Exhibit MEIU-1.3). The Company did not explain how it would determine the rebate amount an applicant would be eligible to receive based on whether the site design meets the other optional criteria.

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[226] *Ibid*.

[227] *Id*., pp. 14-15.

Q. Do you agree with the Company's proposed modifications to its DCFC rebate program?

A. Not entirely. I agree with the Company that safety and access to amenities has become a top area of focus for EV charging manufacturers, site hosts, and installers.[228] The Company's proposed required criteria (i.e., security lighting and minimum number of ports) are reasonable, and the Commission should approve these modifications to the DCFC rebate program. However, while I appreciate that the limited TEP budget requires more careful evaluation of rebate application, I have concerns with some of the Company's proposed optional criteria for its DCFC rebate program as described below.

- *Rebate amount* – As previously stated, the Company notes that "the median and average costs of a 150 kW DCFC construction project range between approximately $200,000 and $237,000." [229] Under current conditions where the applicant can access the 30C tax credit, the Company's $50,000 DCFC rebate would cover about one-third of the total project costs, or the entirety of the make-ready costs, for a two-port DCFC installation.[230] However, as previously noted, based on the Company's cost assumptions, the make-ready cost per DCFC port will increase to between $75,000 and $93,500 without the tax credit. This cost increase could make it more difficult to establish a workable business case for DCFC investments, especially in rural and seasonal travel communities where charging is most needed. If the goal is to deploy funds efficiently and prioritize communities currently lacking DCFC, it may be

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[228] United States Joint Office of Energy and Transportation, "Physical Safety and Security at Electric Vehicle Charging Sites," June 2024, available at https://driveelectric.gov/files/physical-site-security.pdf.

[229] Myrom Direct, p. 13.

[230] *Ibid*.

necessary to increase the rebate amount. To prepare for the loss of the 30C tax credit at the end of 2026 and to ensure that the DCFC program is as effective and impactful as possible, the Commission should direct the Company to increase the DCFC rebate amount to up to $70,000 per port.[231]

- *Time limitation* – Given the new 30C tax credit sunset of June 30, 2026 and the amount of time needed to plan DCFC sites, the proposed two-year limit on the Company's DCFC rebate program is simply too short. At the very least, assuming the rebate amount remains the same, the program should be allowed to extend until depletion of program funding or for six years, whichever comes first. Artificially truncating a program when previously allocated funding remains unspent is not reasonable. Therefore, the Commission should reject the Company's proposed DCFC program two-year time limitation.
- *Geographical limitation* – The rationale to prioritize DCFC rebates to communities that do not yet have adequate DCFC infrastructure (i.e., no more than four 150 kW DCFC ports per community) is sound. In a discovery response (Exhibit MEIU-1.4), witness Myrom defines a community as a "traditional governmental boundary." This could mean any number of official boundaries (*e.g.* village, municipal, school district, county, political district, zip code etc.) and is too vague. Rebate applicants need a clear description of what the Company means by "community" or "traditional government boundary" in order to determine whether a site could be considered eligible for the

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[231] The Company estimates that the cost of a two-port DCFC installation is roughly between $140,000 and $166,000, after factoring in the 30C tax credit. As such, the cost per port with the 30C tax credit is $70,000-83,000. Without the tax credit, however, the cost of a two-port DCFC installation remains the same as the Company's pre-tax credit estimate of $200,000-$237,000. As such the cost per port increases to between $75,000 and $93,500, a difference of between $5,000 and 10,500. Assuming the maximum cost per port, increasing the Company's public DCFC rebate by $20,000 would then roughly cover the cost increase of two port.

rebate program. As such, the Commission should require the Company to clearly define "community" in its DCFC rebate program application guidelines.

Q. Do you have any other concerns with the Company's proposed modifications to its DCFC rebate program?

A. Yes. Conceptually, I support the Company's efforts to ensure that its rebates are used to support DCFC installations that meet – or exceed – the customer's needs. However, the optional criteria, and the manner in which the Company proposes to evaluate and compare applications, lack clarity.

As stated above, it is imperative that site hosts have a clear understanding of the rebate amount they are eligible to receive to effectively plan for the associated project costs. To address this concern, the Company could establish designated amounts or weighted amounts associated with each project criterion and develop a publicly available rubric by which it would score DCFC project applications. If this were done, an applicant proposing a project that meets all the optional criteria would be eligible to receive the maximum rebate amount. Subsequently, applicants proposing to meet some, but not all of the optional criteria, would be eligible for a lesser—but knowable and known—rebate amount. This could be based on evenly distributed weights or dollar amounts, or the Company could designate certain criteria as more important and therefore worthy of greater weight or a higher dollar amount.

In a discovery response (Exhibit MEIU-1.3), witness Myrom indicates that the Company intends to review and award DCFC rebate applications on a monthly basis. This leaves the evaluation process vulnerable to subjectivity in the review process from one month to the next, which could make the review process more contentious as the Company continues to issue rebates and spend program funds. Creating a rubric, as described above, would make it easier for the Company to objectively review each application, ensuring that the process remains consistent throughout the duration of the program.

III. CONCLUSIONS AND RECOMMENDATIONS

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

A. I recommend that the Commission:

- If it approves the Company's proposed modifications to its L2 and L1 rebates (i.e., allowing rebates to apply to NEMA 14-50 and 5-20 outlet installations), require the Company to ensure that a customer who receives a rebate for a NEMA 14-50 or 5-20 outlet actually purchases or otherwise obtains an EV charger or charging cord, and provides proof of EV purchase or lease;
- Approve the Company's proposed DCFC application requirements (i.e., security lighting and number of ports);
- Direct the Company to increase the rebate per 150 kW DCFC port to $70,000;
- Reject the Company's proposed DCFC program two-year time limitation and allow the program to extend until depletion of program funding or for six years;
- Require the Company to provide an explicit definition of a "community" for DCFC rebate eligibility; and

- Require the Company to propose a clear rubric and methodology by which it will evaluate each DCFC rebate application.

Q. Does that complete your testimony?

A. Yes.

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

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In the matter of the application of **Consumers Energy Company** for authority to increase its rates for the generation and distribution of electricity and for other relief.	)))))	**Case No. U-21870**

EXHIBITS OF

SOPHIA SCHUSTER

ON BEHALF OF

THE MICHIGAN ENERGY INNOVATION BUSINESS COUNCIL,

INSTITUTE FOR ENERGY INNOVATION,

AND

ADVANCED ENERGY UNITED

Sophia Schuster, MBA & MSCM

(814) 380-6535 | sophia@mieibc.org

SELECTED EXPERIENCE

Michigan Energy Innovation Business Council (EIBC) and the Institute for Energy Innovation (IEI) Lansing, MI
Policy Principal October 2023 – Present

- Develop regulatory and legislative policy positions to enable transportation electrification, and to support advanced energy and mobility industry sector growth in Michigan.
- Represent Michigan EIBC in the media, at the legislature, with regulators, and with the state administration in collaboration with a broad coalition.
- Engage with the Michigan Public Service Commission and Michigan legislature on behalf of member companies.
- Lead policy initiatives focused on transportation electrification and advanced mobility in Michigan, collaborating with a diverse coalition of state department, trade organization, special interest, and community figureheads.
- Advocate for member advanced mobility and workforce budget priorities with the Executive Office of the Governor, the Legislature, and state department leaders.
- Advise state departments on the development of advanced mobility program RFPs and program implementation.
- Managed the development, publication, and launch of report highlighting the importance of the automotive industry to the Michigan economy and the role that electric vehicles play in the industry's future.
- Coordinated with 20 member companies to identify and research key state policy opportunities and challenges to enable Michigan's electrification goals, resulting in the publication of the Transportation Electrification Roadmap.

The Pennsylvania State University—Office of Central Procurement University Park, PA
Strategic Procurement Intern January 2023 – May 2023

- Led financial analysis and evaluated University assets for high-profile RFP that resulted in a $58M, 10Y contract
- Developed a process map for all IT Software/Courseware purchasing across the University and its 22 branch campuses to launch LEAN analysis and enable process improvement recommendations
- Initiated the strategic process for reviewing IT Software blanket delegations to improve departmental efficiency and the end-user experience

The Pennsylvania State University—Smeal College of Business University Park, PA
SCM406 Strategic Procurement Instructor August 2022 – December 2022

- Implemented marketplace and supply base research, supply segmentation, and portfolio analysis tools, leading to successful, in-depth presentations on seven unique industries
- Cultivated communication and negotiation skills among 24 students, enabling effective leadership, team relationship management, and problem-solving
- Introduced firm financial performance metrics, spend analysis, and total cost of ownership models, empowering students to assess the health and reliability of prospective vendors

The Pennsylvania State University—Smeal College of Business University Park, PA
Sustainability Market Research Consultant May 2018 – May 2019

- Evaluated top 100 MBA programs' curricula for sustainability topics, resulting in a presentation to University leadership on the current and future state of the MBA program
- Consulted with 20 faculty to integrate sustainability issues as a key factor of modern risk analysis into 15 core courses
- Developed customer network of 80 local businesses to serve as pipeline for future student projects

EDUCATION

The Pennsylvania State University, *Smeal College of Business* University Park, PA
Master of Supply Chain Management, GPA: 3.69 May 2023

The Pennsylvania State University, *Smeal College of Business* University Park, PA
Master of Business Administration, GPA: 3.61 May 2019

Albright College Reading, PA
Bachelor of Arts—Environmental Studies & Political Science, GPA: 3.59 May 2012

Question:

6. Refer to the Direct Testimony of witness Jeffrey A. Myrom at p. 11.

a. Please provide, in an excel file with any formulae and links intact, the data referenced as from the Michigan Secretary of State that indicate that “a range closer to 470,000 to 600,000 EVs by 2030 may be more likely in the Company’s territory.”

b. If the Company conducted any modeling to arrive at that range, please provide all of the assumptions and calculations involved.

Response:

a. The Excel file model is attached. In this file the base case tab projects 479,009 EVs by the end of 2030. The high case tab projects 593,971 EVs by the end of 2030. Given these projections the Company presently believes that an estimate ranging between 470,000 and 600,000 EVs in 2030 is reasonable for planning purposes.

b. Please see the spreadsheet model attached per “a” above. The base case model tracks historic adoption of EVs in Consumers Energy’s electric territory utilizing actual Michigan Secretary of State (SOS) quarterly data. The model utilizes historic sales trends to predict EV adoption in the near term, and once adoption levels achieve 7% or greater, the projection then approximates the percentage of sales experienced by Norway. Norway is presently the only country to achieve greater than 90% of sales being EV and thus was approximated as the adoption template. The high case incrementally magnifies the base case projection over time to +25%, representing the continuation of cost and range improvements via technology advances, public charging infrastructure improvements, and economies of scale via factory and battery chemistry developments, all contributing to higher levels of EV adoption than the historic Norway pathway.

Witness: Jeffrey A. Myrom
Date: July 18, 2025

Question:

10. Refer to the Direct Testimony of Witness Jeffrey A. Myrom at pp. 14–15. The Company proposes to have the right to reject applications on a rolling basis that do not offer “quality customer experience” and cites several criteria to be used in evaluating future public DCFC site proposals.

a. Please detail the evaluation process that the company will use to assess each criterion and to compare applications to each other.

b. Please detail the methodology or rubric by which the Company will collectively assess the proposed criteria, including how the company will weight each metric for public DCFC projects to determine prioritization.

c. For each proposed criterion, will the Company use a sliding scale or a simple yes/no determinant?

d. Please indicate the minimum criteria that an application would need to meet to warrant the Company to reject an applicant’s proposal.

e. Specifically, does a host site have to have security lighting?

f. Specifically, does a host site have to have a canopy?

g. Regarding the application closing dates:

    i. Will the Company have established application closing dates?

    ii. If there will not be an established application closing date, will applications simply have to meet the minimum criteria to be funded on a first-come, first-served basis?

    iii. If there will not be an established application closing date, how will applications be compared on a rolling basis?

Response:

a. The evaluation process will utilize the criteria detailed in my Direct Testimony on pages 14-15, paragraph “d”, subparagraphs 1-6.

b. The evaluation criteria referenced in “a” above will be utilized on a “yes/no” basis per “c” below.

c. A yes/no determination will be made.

d. The minimum criteria are found on pages 14-15 of my Direct Testimony as follows:

    i. Per paragraph “d” subparagraph 1, lines 21-23: “In no case shall sites be allowed that do not offer 24-7 charging or that have no public amenities.”.

    ii. Per paragraph “d”, subparagraph 4, line 39: “The host site must have adequate security lighting”.

iii. Per paragraph "d", subparagraph 6, line 12: "all host sites must offer at least two 150 kW DCFC ports".

e. Yes. Lighting is required.

f. No. A canopy is not required but could be a differentiating criterion regarding rebate selection.

g. The Company plans to review applications and designate rebates monthly. If an application does not meet the minimum criteria as noted in "d" above, then the applicant may re-apply with a revised site design. The goal of the temporary DCFC rebate program is to spur the growth of quality fast charging infrastructure and to do so as quickly as possible.

Witness: Jeffrey A. Myrom
Date: July 18, 2025

Question:

9. Refer to the Direct Testimony of witness Jeffrey A. Myrom at p. 13. Witness Myrom states that "DCFC rebates will only be available for communities that do not have at least four 150 kW DCFC ports across two or more different host sites."

a. Please define "community."

b. Is "community" limited in physical space or defined by other traditional governmental boundaries?

Response:

a. A community is a governmental boundary.

b. Per "a" above, it is a traditional governmental boundary.

Witness: Jeffrey A. Myrom
Date: July 18, 2025

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

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In the matter of the application of **Consumers Energy Company** for authority to increase its rates for the generation and distribution of electricity and for other relief.	)))))	**Case No. U-21870**

DIRECT TESTIMONY OF BRETT SPROUL

ON BEHALF OF

THE MICHIGAN ENERGY INNOVATION BUSINESS COUNCIL,

INSTITUTE FOR ENERGY INNOVATION,

AND

ADVANCED ENERGY UNITED

Table of Contents

I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is Brett Sproul. My business address is 1801 Pennsylvania Avenue NW, Suite 410, Washington, DC 20006.

Q. What is your current occupation?

A. I am employed by Advanced Energy United, Inc. ("United") as a Regulatory Policy Principal for the central region states where United is active. This includes Illinois, Indiana, Michigan, and Wisconsin.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of the Michigan Energy Innovation Business Council ("Michigan EIBC"), the Institute for Energy Innovation ("IEI"), and United, collectively referred to as "MEIU."

Q. Please describe your educational and professional background.

A. I hold a Bachelor of Science degree in Environmental Science and Policy with a concentration in Environmental Economics from the University of Maryland – College Park. I have previously worked at the Maryland Public Service Commission serving both as a Regulatory Economist within the Maryland Commission's Technical Staff and as a Technical Advisor to the commissioners at the Maryland Public Service Commission. I have also worked as a Policy Intern at the U.S. Department of Energy, Office of Small and Disadvantaged Business Utilization and as a Research Intern at the U.S. Department of

Agriculture, Sustainable Agricultural Systems Laboratory. The full extent of my educational and professional background can be found in my résumé, attached as Exhibit MEIU-2.1.

Q. Have you provided testimony to a state public service commission in the past?

A. Yes. I have provided testimony to the Maryland Public Service Commission in Delmarva Power and Light Company's application for a multi-year rate plan in Case No. 9681.

Q. Are you offering any exhibits with your testimony?

A. Yes. I am offering the following exhibits:

- Exhibit MEIU-2.1: Résumé of Brett Sproul
- Exhibit MEIU-2.2: Discovery Response GLREA-CE-0284
- Exhibit MEIU-2.3: 2022 Cadmus Study in Case No. 21410, Exhibit No. A-9 (JRB-3)
- Exhibit MEIU-2.4: Discovery Response MEIU-CE-0389
- Exhibit MEIU-2.5: Discovery Response MEIU-CE-0378
- Exhibit MEIU-2.6: Discovery Response MEIU-CE-0379
- Exhibit MEIU-2.7: Discovery Response MEIU-CE-0388
- Exhibit MEIU-2.8: Discovery Response MEIU-CE-0259
- Exhibit MEIU-2.9: Discovery Response MEIU-CE-0377_ATT_3
- Exhibit MEIU-2.10: Discovery Response MEIU-CE-0380
- Exhibit MEIU-2.11: Discovery Response MEIU-CE-0381_ATT_1
- Exhibit MEIU-2.12: Discovery Response MEIU-CE-0381

- Exhibit MEIU-2.13: Discovery Response MEIU-CE-0377

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to offer my analysis and recommendations on Consumers Energy Company's (the "Company" or "Consumers") proposals related to its Demand Response ("DR") programs. I present my concerns with the proposals provided by the Company regarding its Residential Dynamic Peak Pricing ("DPP") program, specifically related to customer demand savings values and bill credit values.

II. DR PROGRAMS OVERVIEW

Q. How does Consumers define DR?

A. Consumers' witness Alex Gast states in his direct testimony that:

> "DR programs help manage capacity need for peak demand, in lieu of additional supply-side electric generation or capacity contracts. Ultimately, the Company's DR programs help balance Michigan's electricity needs to help protect the grid, react to emergencies and severe weather, and avoid the cost of additional generation infrastructure to serve peaks."[1]

Furthermore, witness Gast states that:

> "Demand-side resources such as DR are essential to meeting climate goals and achieving the MWs approved in the IRP. The DR program remains essential to the Company's long-term ability to achieve greater flexibility and improved sustainability over the long term."[2]

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[1] Direct Testimony of Alex Gast on behalf of Consumers Electric Company ("Gast Direct"), Case No. U-21870, pp. 6–7.

[2] *Id.*, p. 7.

Q. Does the definition of DR provided by the Company align with industry definitions?

A. Yes, Consumers' definition of DR and DR programs is generally aligned with industry definitions, especially regarding the importance of DR to meeting clean energy goals and achieving flexibility and sustainability over the long-term. It may also help to consider a description offered by Lawrence Berkeley National Laboratory: "Demand response happens when a utility, aggregator or grid operator enables electricity customers to change their power consumption through financial or other incentives."[3]

Q. What is the value of DR programs?

A. As stated above, the ultimate goal of DR is to help balance electricity needs to help protect the grid, react to emergencies and severe weather, and avoid the cost of additional generation infrastructure to serve peaks. DR programs are also important for both electric utility customers and the electric utility itself. For instance, on the customer-side, DR programs utilizing time-of-use rates can allow a customer to realize significant utility bill savings due to the reduction in electricity usage during times of peak electricity demand when electricity prices are highest. Additionally, some DR programs can also benefit customers via utility-provided bill credits for actively participating in a DR program. On the utility-side, as mentioned, DR programs can assist a utility's efforts in balancing electricity capacity during peak demand hours and reduce the need for distribution or supply-side investments, thus reducing the cost to supply electric service to customers.

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[3] Lawrence Berkeley National Laboratory, *Demand Response Research Center*, available at https://buildings.lbl.gov/demand-response.

Q. What DR programs does Consumers currently operate?

A. As discussed in Company witness Gast's direct testimony, Consumers currently operates three residential customer DR programs and two commercial & industrial ("C&I") customer DR programs, for a total of five DR programs across the entirety of Consumers' operations.[4]

The Company's residential customer DR programs consist of 1) the Device Cycling program, 2) the DPP program, and 3) the Smart Thermostat program. Through the Device Cycling program, the Company installs direct load control switches on a customers' high energy use appliances (such as air conditioning units) in order to control appliances' energy usage during periods of high demand. The DPP program consists of two pricing options – the Critical Peak Pricing ("CPP") program and the Peak Time Rewards ("PTR") program – which are designed to encourage reduced energy use during periods of high demand. The Smart Thermostat program allows the Company to utilize select wi-fi enabled Smart Thermostats in customers' homes to optimize the use of air conditioning units during periods of high demand.

The C&I DR programs consist of 1) the Business DR Contractual Payment program and 2) the Business DR Rate Options. Through the Business DR Contractual Payment program, the Company provides a payment, based on a contractual agreement, to a business to reduce electricity load by a specific amount during Midcontinent Independent System Operator ("MISO") emergencies. The Business DR Rate Options consists of four different types of

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[4] Gast Direct, p. 4.

specific rate options that provide discounts with the intended purpose of incentivizing a business' reduction of electricity load during MISO emergencies.[5]

Q. What is the current status of Consumers' DR programs?

A. Table 1 below provides the number of participants and the megawatt ("MW") amount of enrolled capacity within each specific DR program offered by the Company.

Table 1: Demand Response Program Status[6]

Demand Response Program Status (2024 Data)		
Program	**Program Participants**	**Enrolled Capacity (MW)**
Residential Device Cycling	95,000	57.3
Residential Dynamic Peak Pricing Program	176,000	37.9
Residential Smart Thermostat	59,000	54.2
Business DR Contractual	1,402	249
Business DR Rate Options	39	259.5

Furthermore, Company witness Megan Metz estimates the impacts of DR programs within her direct testimony. When representing the impacts of different DR programs, witness Metz organizes DR programs into two categories: 1) programs that Consumers has direct control over, and 2) programs that are dependent upon customer behavioral choices.

[5] The four different types of specific rate options include: 1) General Interruptible Service, 2) General Interruptible Service, 3) Rate Energy Intensive Primary Service, and 4) Long-Term Industrial Load Retention Rate Service. *See* Gast Direct, p. 4

[6] Gast Direct, p. 4.

Programs that Consumers has direct control over are eligible to receive Zonal Resource Credits ("ZRC") from MISO as a capacity resource and include the following programs: Residential Air Conditioning Peak Cycling, Residential Smart Thermostat, Business DR Contractual Payments, and Business DR Rate Options.[7] The estimated impact for these programs are 651.4 ZRCs (valued at $62 million) for planning year 2025/2026 and 684.3 ZRCs (valued at $65 million) for planning year 2026/2027.[8]

Demand-side management programs (which includes DR programs) that are dependent upon customer behavioral choices include: DPP, Energy Waste Reduction ("EWR"), Conservation Voltage Reduction, and Residential Summer on-peak rates. The estimated impact for these programs is 1,023 MW for planning year 2025/2026 and 1,114 MW for planning year 2026/2027.[9]

Q. How does Consumers currently recover the costs associated with operating its DR programs?

A. Costs associated with Consumers' DR programs are allocated in the Company's cost of service study using the production capacity allocator 220 (4CP 75/0/25) which recognizes that DR programs are a capacity resource that should be allocated in the same manner as other capacity costs. This methodology is in-line with common best practices and is consistent with the methodology that was previously approved by the Michigan Public

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[7] A Zonal Resource Credit is a capacity credit increment equal to 1 MW of generation resource that is awarded by MISO for a utility's DR programs that are directed by the utility. *See* Direct Testimony of Megan Metz on behalf of Consumer Energy Company ("Metz Direct"), Case No. U-21870, pp. 19, 23.
[8] Metz Direct, p. 24.
[9] *Ibid.*

Service Commission ("Commission") in Case No. U-21389. The Company is proposing to continue the use of this methodology in the instant rate case.[10]

Q. What is the revenue requirement that Consumers is requesting in the instant rate case associated with its DR programs?

A. The projected revenue requirement associated with DR programs for the test year ending April 30, 2027 is calculated within the Company's Exhibit A-83 (PDD-59).[11] As calculated in Exhibit A-83 (PDD-59), the residential DR programs revenue requirement is $21,321,000, the C&I DR programs revenue requirement is $22,251,000, and the total DR programs revenue requirement is $43,572,000.[12]

Q. Is Consumers proposing any changes to its cost recovery methodology associated with its DR programs?

A. Yes, the Company is proposing to remove the total revenue requirement associated with DR programs from base rates and instead collect the total DR programs revenue requirement via a DR surcharge on customer bills.[13] The revenue requirement would be allocated among the following rate classes: residential, commercial secondary, lighting and unmetered, primary, and rate General Self-Generation.[14] The Company proposes to adjust the surcharge through its annual DR reconciliation proceedings to account for changing

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[10] Direct Testimony of Emily Davis on behalf of Consumers Energy Company ("Davis Direct"), Case No. U-21870, p. 22

[11] Direct Testimony of Patrick Daly on behalf of Consumers Energy Company ("Daly Direct"), Case No. U-21870, p. 39.

[12] Consumers Energy Company Exhibit A-83 (PDD-59), Case No. U-21870, p. 1.

[13] *See* Direct Testimony of Laura Connolly on behalf of Consumers Energy Company ("Connolly Direct"), Case No. U-21870, p. 14.

[14] Consumers Energy Company's Exhibit A-89 (EAD-5), Case No. U-21870, p. 1.

costs, over/under-recoveries, and recovery of the performance incentive rather than making these adjustments through a rate case.[15] The Company asserts that this proposal is consistent with the Commission's Order in Case No. U-21585 that approved the DR surcharge methodology.[16]

Q. What are the proposed DR surcharge amounts that are being proposed for different individual customer classes?

A. The proposed DR surcharge rate is calculated in Company witness Laura Connolly's Exhibit A-66 (LMC-5) at page 1. Of particular note, the DR surcharge rate for all residential customer classes is proposed to be $0.002009 per kilowatt-hour ("kWh").

Q. What is your position on the changes that Consumers is proposing to its cost recovery methodology for its DR programs?

A. Without more information about possible impacts from this change, I do not have a specific position at this time. I do, however, recommend that the Commission's decision in this case on the DR surcharge methodology and process be appropriately aligned and consistent with any Commission decisions made in the ongoing open docket to examine issues related to rate case procedures in Case No. U-21637.[17]

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[15] Gast Direct, p. 8.
[16] *Ibid.*
[17] Michigan Public Service Commission Order, Case No. U-21637, July 10, 2025, p. 39. The Commission states that "The Staff proposes addressing DR in rate cases; and Consumers proposes retaining a combined annual DR plan and reconciliation proceeding that is separate from the rate case. The Commission seeks comment on both proposals."

III. DPP DR PROGRAM

Q. Please describe Consumers' DPP DR program.

A. As noted above, the residential DPP program consists of two pricing options: the CPP program and the PTR program. While the CPP and the PTR programs utilize different approaches, both are focused on achieving the same goal: encouraging reduced energy use during periods of high electricity demand. Consumers refers to periods of high electricity demand, when it uses DR resources, as "DR Events."

The CPP program disincentivizes customer electricity use during DR Events by charging a significantly higher rate (currently $1.00 per kWh) for electricity use during the DR Event time period (typically between 2 and 6 P.M.). In exchange for being subject to the high $1.00 per kWh rate, customers enrolled in the CPP program are offered a discounted rate (typically a 10 to 20% reduced rate) during weekends, holidays, and all weekday hours except for 2 p.m. to 7 p.m. As of August 18, 2025, there are 24,860 residential customers enrolled in the CPP program (Exhibit MEIU-2.2).

The PTR program incentivizes reduced customer electricity usage during DR Events by providing a bill credit to customers for reduced electricity use during the DR Event. Specifically, the PTR program currently provides a bill credit of $1 per kWh of electricity that is reduced (compared to a customer's baseline usage on similar weather day conditions) during the DR Event. As of August 18, 2025, there are 173,559 residential customers enrolled in the PTR program (Exhibit MEIU-2.2).

Q. How does the Company determine when to initiate a DR Event?

A. DR Events are initiated by Consumers when forecasted 4-hour load capacity requirements exceed 27,000 Megawatt-hours ("MWh") in order to reduce the Planning Reserve Margin Requirement (Exhibit MEIU-2.3). Customers enrolled in the DPP program are typically given a day-ahead notice for each DR Event and each DR Event typically occurs between 2 p.m. and 6 p.m. (Exhibit MEIU-2.3). DR Events are initiated by Consumers rather than in response to a MISO emergency, and Consumers can initiate a maximum of 14 DR Events in a single year (Exhibit MEIU-2.3). For residential DR programs, Consumers typically coordinates the dispatch of programs during declared DR Events but can dispatch individual programs in the case of an economic event and not an emergency event (*i.e.* during an economic crisis where constraint on the grid may be of less concern) (Exhibit MEIU-2.4). According to Consumers, no DR Events have been called since 2022 (Exhibit MEIU-2.5). In 2022, five DR Events were called on the following dates: June 15, June 21, June 22, July 19, and July 21 (Exhibit MEIU-2.3).

Q. How does Consumers communicate the likelihood of an upcoming DR Event to participating customers?

A. When Consumers forecasts for a DR Event, customers participating in the DPP program will receive a notice before the DR Event occurs (typically one day ahead). Customers may choose to receive the notice via text, voice alerts, and/or e-mail (Exhibit MEIU-2.3). In 2022, Consumers engaged in outreach efforts to phase-out phone call notifications for DR Events and encouraged customers to opt for email or text message notifications of DR Events (Exhibit MEIU-2.6). This outreach effort is aligned with the findings of the 2022

Cadmus Study which showed that DPP participants that received text or voice communications delivered the largest kilowatt ("kW") impacts (Exhibit MEIU-2.3).

Q. How do customers benefit from participation in the DPP program?

A. Customers that participate in the DPP Program realize two main benefits: 1) reduced energy costs, and 2) greater control over their energy usage.[18] Customers participating in the DPP program can reduce their electricity costs by reducing their electricity usage during DR Events and by receiving direct monetary benefits from the DPP program (either through the PTR program bill credits or through the CPP program discounted rates). DPP program participants also assert greater control over their energy usage and their electricity bill by having the ability to adjust their usage during DR Events. For example, during a DR Event, a DPP program participant can reduce their usage and realize extensive bill savings as a result, whereas a non-DPP program participant may be unable to act in the same way. In 2022, the average per customer demand savings was 0.171 kW for the CPP program (with average summer bill savings of $10.36) and 0.125 kW for the PTR program (with average summer bill savings of $9.12) (Exhibit MEIU-2.3).

Q. What common characteristics do customers share that participate in the DPP program?

A. The DPP program has the highest rate of low-income customer enrollments relative to all other DR programs that the Company offers.[19] In 2022, 13% of customers enrolled in the

[18] Gast Direct, p. 7.
[19] Gast Direct, p. 14.

CPP and PTR programs were identified as "low-income," where "low-income" was generally defined as a customer that participated in payment assistance, Consumers Affordable Resource for Energy program, or Income-Qualified EWR participation.[20] According to a discovery response (Exhibit MEIU-2.7), as of September 9, 2025, there are 2,255 low-income customers enrolled in the CPP program and 17,450 low-income customers enrolled in the PTR program. Consumers has also determined that the PTR program largely consists of "entry-level" DR program participants due to the program's high enrollment rate and low (comparatively to other DR programs) per customer demand savings achieved.[21]

Q. Please describe the 2022 Cadmus Study that Consumers uses to inform the DPP programs.

A. In 2022, the Company contracted with Cadmus, a third-party evaluator, to review its DPP programs and evaluate the impact results of the DPP programs during the DR events that occurred in 2022. Cadmus developed a study for the Company (herein referred to as the "2022 Cadmus Study;" Exhibit MEIU-2.3. Company witness Gast states in his direct testimony that, "The Company, working with its third-party evaluator Cadmus, predicted a lower capability than the 2022 planning value previously used."[22] In a discovery response providing more information about the 2022 Cadmus Study (Exhibit MEIU-2.8), the Company stated, "In 2025, Cadmus conducted an analysis that applied the distribution of impacts and bill credits from summer 2022 events to current program enrollment levels,"

[20] Exhibit MEIU-2.3. 2022 Cadmus Study, Case No. 21410 Exhibit No. A-9 (JRB-3), p. 42.
[21] Gast Direct, p. 14.
[22] *Ibid.*

and referred to a Cadmus-produced study on the Residential Dynamic Peak Pricing Impact Results from 2022 that was provided as Exhibit No. A-9 (JRB-3) in Case No. U-21410.

The 2022 Cadmus Study focused on the following research objectives: 1) what is the average kW reduction per participant, 2) what are the aggregate MW and MWh reductions on Summer 2022 DR Event days, 3) how do the load impacts vary, and 4) how did DPP participation affect customer bills during Summer 2022 (Exhibit MEIU-2.3). To understand the programs and make recommendations to the Company, Cadmus analyzed the average customer demand savings for the CPP and PTR programs across the five different DR Events that occurred during the summer of 2022 (Exhibit MEIU-2.3). To further analyze the data and identify trends in the programs, Cadmus segmented the CPP and PTR program participants by dwelling type, income status, enrollment year, customer type, communication channel, and receipt of an educational e-mail (Exhibit MEIU-2.3).

In the 2022 Study, Cadmus calculated average customer demand savings for each individual DR Event during 2022 for the CPP and PTR programs, as well as capability values for both the CPP and PTR programs. The "per customer demand savings" is best understood as the amount of kW that an individual customer reduces their electricity usage as a result of the incentive/disincentive associated with the CPP or PTR program. "Per customer demand savings" is calculated using a difference-in-differences model comparing usage of treatment and control groups and adjusted for potential confounding factors such as hour and day fixed effects (Exhibit MEIU-2.8). The Company can analyze historical data on the average per customer demand savings for past DR Events to develop "capability values" for the CPP and PTR programs. "Capability values" represent the estimated per customer impact of each program and, per the 2022 Cadmus Study, are calculated based on a regression analysis of 2022 evaluated impacts against average outdoor event temperature on that day (Exhibit MEIU-2.3). "Capability values" are used to estimate the impact and effectiveness of the CPP and PTR programs. For program design, Consumers currently uses "capability values" of 0.21 kW/customer for the PTR program and 0.25 kW/customer for the CPP program.[23] In the 2022 Study, however, Cadmus calculated customer demand savings capability values (with predicted capability at 90 degrees F) at 0.18 kW for the CPP program and 0.13 kW for the PTR program. In other words, the estimated per customer demand savings that Cadmus predicts will be achieved through the PTR and CPP programs is lower than what the Company utilizes for program design.

Q. Did the 2022 Cadmus Study offer any recommendations?

A. Yes. The 2022 Cadmus Study offered three of what it characterized as "recommendations" concerning the DPP Program:

1. Under planning conditions of 90 degrees F, [Cadmus] predicts an average per-participant performance of 0.18 kW for CPP and 0.13 kW for PTR. The assumed planning condition comes from average Michigan temperatures 2pm – 6pm during peak-demand days in MISO Load Resource Zone 7 from 2013 to 2021.
2. Consumers Energy should explore a mechanism to claim 50-60 MWh of EWR per DPP event.
3. Consumers Energy should encourage participants to select text message alerts at enrollment and do a campaign with legacy participants encouraging them to sign up for text alerts of Energy Savings Events (Exhibit MEIU-2.3).

[23] Gast Direct, p. 13.

Regarding the customer demand savings capability values, the 2022 Cadmus Study also recommended that Consumers:

> review expected performance under planning conditions annually to ensure that long term trends are accounted for appropriately if and when they occur – especially if Consumers Energy plans to seek Zonal Resource Credits at MISO (Exhibit MEIU-2.3).

These recommendations, as provided by Cadmus in the 2022 Study, are used by Consumers to inform its proposals for the DPP program.

Q. Please describe the 2025 Cadmus Presentation on PTR Alternative Settlement Investigation ("Presentation").

A. On April 2, 2025, Cadmus provided a presentation to Consumers on the PTR program (Exhibit MEIU-2.9). The Presentation primarily focused on analyzing the PTR program and exploring different potential opportunities to improve program cost-effectiveness. The Presentation stated that the primary benefit for the PTR program is fixed whether you call events or not and consists of the ability to reduce demand if needed and avoid construction or purchases from the grid. The Presentation applied the distribution of impacts and bill credits from summer 2022 DR Events to current program levels and tested four different alternative settlement approaches to improve the cost effectiveness of the PTR program. As shown in Exhibit MEIU-2.9, the four different alternative settlement approaches provided were:

1. Minimum Threshold – Establish a minimum threshold and only provide bill credits if savings exceed a certain threshold (1 kWh is used as an example).

2. Cap on Credits – Establish a cap on the amount of credits, where, for example, if a customer saves 22 kWh, the customer only receives credits for 5 kWh (5 kWh is used as an example).
3. Round Down – Savings are rounded down to the nearest integer, where, for example, if a customer saves 1.88 kWh, the customer only receives credit for 1 kWh.
4. Reduced Incentive Rate – Lowering the $/kWh bill credit payment rate (50% reduction in incentive rate is used as an example).

As described in more detail within the Presentation, each alternative settlement approach comes with pros and cons and it is specifically stated in the Presentation that "Reducing incentives could improve the cost-effectiveness of events, *but potentially at expense of diminished response by participants*" (emphasis added) (Exhibit MEIU-2.9).

Q. Is Consumers proposing any changes to the CPP and PTR programs in the instant rate case based on the 2022 Cadmus Study or the 2025 Cadmus Presentation?

A. Yes. Consumers is proposing to reduce the expected per customer demand savings (aka the "capability value") for the PTR program from 0.21 kW/customer to 0.13 kW/customer and for the CPP program from 0.25 kW/customer to 0.18 kW/customer based on the analysis from the 2022 Cadmus Study.[24] In other words, the Company is proposing to reduce the estimated per customer demand savings that the Company predicts will be achieved through the PTR and CPP programs. The Company is also proposing to reduce the bill

[24] Gast Direct, p. 13.

credit offered by the PTR program from $1.00/kWh of energy reduced to $0.50/kWh of energy reduced based on the analysis from the 2025 Cadmus Presentation.[25]

Consumers states that it is proposing these changes to align with the research conducted by Cadmus, which predicted a lower customer demand savings capability value for the CPP and PTR programs.[26] As detailed in Exhibit MEIU-2.8, Consumers asserts that the main reason for proposing these changes is to improve the cost-effectiveness of the CPP and PTR programs. Consumers specifically utilized the 2025 Presentation as the origin for proposing a 50% reduction in PTR program bill credits in the instant rate case; however, it is important to note that the Presentation does specifically ask a crucial question regarding reduced incentives stating, "Will customer take the same amount of action for half the money?" (Exhibit MEIU-2.9).

Q. Is Consumers proposing any changes to the PTR program's customer enrollment incentives or marketing activities?

A. For the PTR program, the Company is also proposing to discontinue customer enrollment incentives and shift to low-cost marketing channels for the PTR program, including the use of Consumers' website during the time of a customer's move-in.[27]

[25] *Ibid.*
[26] *Id.*, p. 14.
[27] Gast Direct, p. 15.

Q. What cost-effectiveness considerations does Consumers focus on for the DPP program?

A. Consumers has a central focus on improving the cost-effectiveness of the PTR program and DR programs as a whole. Regarding DR programs, within his direct testimony, Consumers' witness Gast states, "The Company has taken efforts to reduce costs and increase MWs," and, "[T]he Company seeks to expand DR opportunities in the most cost-effective ways."[28] In a discovery response (Exhibit MEIU-2.10), the Company stated that it "includes a benefit-cost analysis in each of its annual Demand Response reconciliation filings." The Company also provided the benefit-cost analysis that was conducted on the DPP program for its 2024 DR Reconciliation (Exhibit MEIU-2.11) and stated in a separate discovery response (Exhibit MEIU-2.12) that for this analysis "the Company compares the levelized cost of the program to 75% of Cost of New Entry ("CONE"), which is considered the primary benefit of the demand response program." Based on the 2024 benefit-cost analysis provided by the Company (Exhibit MEIU-2.11), the DPP program exhibits the lowest levelized cost of all of the DR programs listed in the analysis with a levelized cost of $24,491 per MW. The other programs listed in the analysis are the Device Cycling program with a levelized cost of $193,671 per MW, the Smart Thermostat program with a levelized cost of $134,565 per MW, and the C&I programs with a levelized cost of $53,147 per MW. Furthermore, when comparing the levelized cost and the 75% CONE benefits, both weighted for the amount of MISO-registered MW (of which the DPP program used a proxy of 70% enrolled MW), the results showed that the DPP program exhibited total net benefits for 2024 with a shared difference (based on 50% of savings shared) between costs

[28] Gast Direct, p. 7.

and benefits of $927,554. In contrast, the Device Cycling program showed a difference between costs and benefits of -$2,163,045 and the Smart Thermostat program showed a difference between costs and benefits of -$823,484 (negative numbers indicating that both programs exhibited net costs). Similar to the DPP program, the C&I programs also exhibited net benefits with a difference between costs and benefits of $8,871,376.

Q. Do you agree with Consumers' proposal to reduce the per customer demand savings values for the CPP and PTR programs?

A. No. I believe that these values may be inaccurate and unrepresentative of the current CPP and PTR programs. To make this proposal, Consumers utilizes customer demand savings capability values calculated in the 2022 Cadmus Study. The usage of data from three years ago to establish the customer demand savings values for the CPP and PTR programs in 2025 and the indefinite future is inappropriate and could lead to decisions that undermine the success of the DPP program. To calculate the customer demand savings capability values being proposed by Consumers, Cadmus utilized data from five DR events in 2022 with an average enrollment level of 14,117 participants for the CPP program and 77,019 participants for the PTR program (Exhibit MEIU-2.3). Relying on 2022 data to inform the DPP program in 2025 is inherently flawed. DPP program levels have nearly doubled since 2022, as there are now 24,860 participants enrolled in the CPP program and 173,559 participants enrolled in the PTR program (Exhibit MEIU-2.2). Company witness Gast even acknowledges this enrollment growth in the DPP program within his direct testimony by stating that "the Company has seen a higher enrollment rate for PTR compared to other

DR offerings with 153,147 cumulative enrollments in 2024."[29] Due to these vastly different enrollment levels between 2022 and 2025, it is reasonable to assume that the per customer demand savings values will likely differ between 2022 and 2025.

Furthermore, Cadmus specifically recommended that the Company review expected performance under planning conditions annually to ensure long-term trends are accounted for appropriately if and when they occur (Exhibit MEIU-2.3). However, in a discovery response (Exhibit MEIU-2.5), the Company stated that it "has not undertaken this review since 2022" and that "no events have been called since 2022. Therefore, performance reviews have not been an opportunity." In other words, Cadmus recommended an annual review of expected performance in order to keep the DPP program capability values updated and accurate, but the Company has not conducted this review. This supports my point that the Company's proposed changes to the customer demand savings capability values for the CPP and PTR programs lack a reasonable basis. Furthermore, the fact that the Company is proposing to make changes to the DPP program when there has not been a DR event to analyze since 2022 provides justification that the Company's proposals may be inaccurate and unsubstantiated.

Q. What recommendations do you have for the Commission regarding per customer demand savings values for the PTR and CPP programs?

A. I recommend that the Commission reject Consumers' proposal to reduce the per customer demand savings values for the PTR and CPP programs until the Company conducts an

[29] Gast Direct, p. 14.

updated analysis and review of the PTR and CPP programs' expected performance under current planning conditions.

Q. How does Consumers propose to change the PTR Program bill credits in this case?

A. The Company is proposing to reduce the bill credit offered by the PTR program from \$1.00/kWh of energy reduced to \$0.50/kWh of energy reduced. This is based on the Cadmus 2025 Presentation that suggested a 50% reduction in PTR program bill credits to achieve greater cost-effectiveness. However, the Presentation does specifically ask a crucial question regarding reduced incentives stating, "Will customer take the same amount of action for half the money?" (Exhibit MEIU-2.9), a question that Consumers does not grapple with in its own discussion of its proposal.

Q. Do you agree with Consumers' proposal to reduce the PTR program credit value?

A. No. I believe that the proposed bill credit value is unjustified. Consumers' states that "with this lower [customer demand savings capability] value being nearly half the previous value for PTR, the Company determined that the credit offered to these customers should also be halved."[30] Consumers attempts to defend this proposal using information provided by Cadmus, which states that "lowering the incentive per kWh saved can achieve up to 50% in cost savings, *assuming consumer behavior stays the same*" (emphasis added) (Exhibit MEIU-2.8). It is critical to note that in making this proposal, the Company *<u>does not</u>* take into account whether consumer behavior will stay the same or change at the reduced incentive level. It is telling that even Cadmus questions this assumption, stating on a slide

[30] Gast Direct, p. 14.

in the 2025 Presentation: "Will customers take the same amount of action for half the money?" (Exhibit MEIU-2.9). In a discovery response (Exhibit MEIU-2.13) regarding how changing the incentive may change customer behavior, Consumers specifically states that it "identified the potential risk but did not have any data to support how changing the incentive amount would affect customer behavior."

I contend that it is reasonable to assume that if the PTR bill credit (i.e. the customer incentive) is reduced by 50%, then consumer behavior will likely change because the consumer is less incentivized to adjust their behavior compared to the previous incentivization. Without getting additional data on how reducing the PTR program bill credit will impact customer behavior, it is premature to propose such a drastic change in the instant rate case.

Q. Do you agree with Consumers' considerations regarding cost-effectiveness of the DPP program?

A. No. Cost-effectiveness is always important when considering the successfulness of any program, and Consumers has stated that its proposals to the DPP program are intended to "help improve cost-effectiveness." (Exhibit MEIU-2.8). However, as described previously, Consumers has failed to prove that the DPP program under the current construct is not already cost-effective. The results of the conducted benefit-cost analysis show that the DPP program is already a cost-effective program that exhibits net benefits and has the lowest levelized cost per MW when compared to all other DR programs that Consumers oversees. Therefore, the DPP program should not be changed based on the unsubstantiated argument that the DPP program needs to improve its cost-effectiveness.[31] Doing so may in fact have the effect of undermining or even sabotaging an already cost-effective program by making the perfect the enemy of the good.

Additionally, it is important to note that this program has a relatively low cost and bill impact for residential customers, with a proposed annual surcharge of $0.002009 per kWh applied to all residential customers for all of the residential DR programs, costs which, again, are made up for elsewhere through this cost-effective program.

Q. Do you agree with Consumers' proposal to discontinue the PTR program customer enrollment incentives?

A. No. In his direct testimony, Company witness Gast states that,

> Given the change in strategy to use PTR as a gateway DR program, the Company has made significant changes to reduce expenses for the program to improve cost-effectiveness. The Company is: (1) working on the discontinuation of customer enrollment incentives, and (2) focusing primarily on low to no cost marketing channels including the Consumers Energy website during the time of move-in.[32]

I disagree with the Company's proposal to discontinue the customer enrollment incentives for the PTR program in order to improve program cost-effectiveness. There is no merit in discontinuing the use of customer enrollment incentives and shifting towards low to no cost marketing channels, especially considering that this program already appears to be cost-effective as established in the prior sections of my testimony. Furthermore, I contend

[31] I also contend that, given the DPP Program's focus on low-income and "entry-level" DR participants, cost-effectiveness may be of less importance for this program. An opportunity under this program and a non-quantifiable benefit is to introduce customers to other DR programs and make customers knowledgeable of DR.
[32] Gast Direct, p. 15.

that the existing customer enrollment incentives and marketing efforts are likely the exact actions that allowed the PTR program to evolve into a "gateway DR program" over time.

IV. RECOMMENDATIONS AND CONCLUSIONS

Q. Please summarize your recommendations for the instant rate case.

A. I recommend that the Commission:

- Reject Consumers' proposal to reduce the per customer demand savings values for the CPP and PTR programs until the Company conducts an updated analysis and review of the CPP and PTR programs expected performance under current planning conditions.
- Reject Consumers' proposal to reduce the PTR program bill credit value on the grounds that Consumers has not conducted an analysis or obtained information on how changing the incentive amount would affect customer behavior.
- Reject Consumers' proposal to discontinue PTR program customer enrollment incentives.

Q. Does this conclude your testimony?

A. Yes.

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

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In the matter of the application of **Consumers Energy Company** for authority to increase its rates for the generation and distribution of electricity and for other relief.	)))))	**Case No. U-21870**

EXHIBITS OF

BRETT SPROUL

ON BEHALF OF

THE MICHIGAN ENERGY INNOVATION BUSINESS COUNCIL,

INSTITUTE FOR ENERGY INNOVATION,

AND

ADVANCED ENERGY UNITED

Brett Sproul

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Work Experience

Advanced Energy United, Chicago, IL **Apr. 2025 - Present**
Policy Principal

- Consistently engaged with over 100 different individual member companies, collaborated with colleagues, and provided regulatory expertise on energy-related matters in Wisconsin, Illinois, Indiana, and Michigan.
- Oversaw the preparation of official comments on utility Performance-Based Ratemaking broadly covering Performance-Incentive Mechanisms, Multi-Year Rate Plans, and Earnings-Sharing Mechanisms to be filed with both the Michigan Public Service Commission and the Indiana Utility Regulatory Commission
- Thoroughly analyzed utilities' Integrated Resource Plans in Indiana focused on future generation resource additions and prospective energy load forecasting in order to provide expert commentary to regulatory bodies.
- Prepared comments on Illinois' Long-Term Renewable Resource Procurement Plan focused on the effectiveness of the State's renewable energy programs and the feasibility of achieving the Illinois' renewable energy goals

State of Maryland Public Service Commission, Baltimore, MD **Oct. 2022 – Apr. 2025**
Technical Advisor to the Commission

- Provided technical expertise and guidance directly to a group of four Commissioners and one Chairperson with the purpose of offering decisive insight on generalized matters such as: Renewable Energy Implementation, Energy Affordability, Utility Regulatory practices, and Utility Rate Case Adjustments.
- Presented detailed testimony to the Maryland State General Assembly on proposed legislature focused on Net Energy Metering (2023 SB143), Community Solar Operations (2023 HB908), Solar Renewable Energy Credits (2024 SB783), Energy Storage Implementation (2023 HB910), and Time-of-Use Rates (2024 HB1256).
- Facilitated the implementation and led the execution of state-administered, multi-stakeholder working groups on topics such as: rate design for residential time-of-use rates, data realization of arrearage and affordability metrics, and Unified Benefit-Cost Analysis' for Distributed Energy Resources.
- Prepared various reports for submission to the Maryland State General Assembly on the status of critical state energy programs including the Net Metering Report, the Renewable Energy Portfolio Standard Report, and the Electric Universal Service Program Report.
- Oversaw the implementation of a Solar Renewable Energy Credit (SREC) multiplier in-line with 2024 Senate Bill 783 and served as Contract Manager for a Request for Proposal (RFP) to establish a new SREC application portal.

State of Maryland Public Service Commission, Baltimore, MD **Aug. 2021 – Oct. 2022**
Regulatory Economist, Electricity Division

- Served as a witness for judicial proceedings on electric utility distribution rate cases providing expert testimony on utilities' electric cost of service.
- Analyzed administrative filings on a wide-range of topics through researching legal precedent, communicating with involved parties through data requests, and conducting economic analysis using Microsoft Excel in order to present technical comments and recommendations to the Commission at weekly Administrative Meetings
- Prepared and assisted the submission of reports for the Commission, such as the 2021 Maryland Net Metering Report the 2022 Supplier Diversity Report and the monthly retail electric choice reports, through the utilization of statistical and economic analysis' and relevant industry knowledge.
- Participated as an active member of the Regional Greenhouse Gas Initiative ("RGGI") Program Review Subgroup on Environmental Justice, and collaborated with officials from 11 states with a goal of recommending program changes to RGGI in order to address environmental justice and energy equity concerns

Future Harvest and University of Maryland Soil Quality Lab, College Park, MD **Mar. 2021 – Aug. 2021**
Research and Development Assistant, Transitional and Organic Grain Project

- Developed a holistic directory for regional grain buyers to purchase transitional organic grain from local farmers
- Researched, contacted, and collected data on local potential buyers and producers of organic transitional grain
- Identified processing needs, associated costs, and facilities required to make grains market-ready for buyers

University of Maryland Soil Quality Lab, College Park, MD **Aug. 2020 – Aug. 2021**
Undergraduate Research Assistant, Soil Quality Management for Sustainable Agriculture

- Assisted Dr. Raymond Weil in research projects related to the enhancement of cover crop and soil quality systems
- Collected and analyzed soil and biomass sample data to better advance the processes of sustainable agriculture
- Installed groundwater wells and lysimeters to collect and compile data on water quality and nutrient levels

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U.S. Department of Agriculture, Beltsville, MD **May 2020 – Aug. 2020**
Research Intern, Sustainable Agricultural Systems Laboratory
- Assisted cover crop breeding projects and interseeding projects to achieve more sustainable agricultural practices
- Collected and processed biomass samples from cash and cover crop fields for nutrient level and crop yield studies
- Ground and threshed biomass and seeds to analyze and compile data on crop yields and nutrient levels

U.S. Department of Energy, Washington D.C. **Jan. 2020 – Apr. 2020**
Policy Intern, Office of Small and Disadvantaged Business Utilization
- Assisted in the contracting of various small businesses which, in total, amounted to $7.5 billion in FY19
- Analyzed crucial eSRS-NG and FPDS data to present the level of financial success through each fiscal year

Education

University of Maryland, College Park, MD **Aug. 2017 – May 2021**
Bachelor of Science, Environmental Economics (cumulative GPA: 3.63)

Federal Fellows - Energy and the Environment Concentration **Aug. 2019 – May. 2020**
Selective program combining a fall seminar on the energy and environmental sector taught by expert practitioners from the EPA and DOE, and a spring internship in Washington D.C.

Capstone Research – Prince George's County Department of Parks and Recreation **Aug. 2020 – Dec. 2020**
Assisted the Division of Maintenance and Development in their assessment of annual baseline carbon emission levels in order to develop strategies to reach zero net carbon emissions from vehicles and equipment by 2030.

National Association of Regulatory Utility Commissioners (NARUC) – Rate School **May 2022**
Week-long training course taught by public utility regulatory experts with the goal of providing advanced insight into the skills and processes that are used for public utility rate setting such as analysis of capital structure, calculation of rate design, and determination of return on equity

Relevant Coursework:
Energy and Environmental Economics • Applied Econometrics • Introduction to Horticulture • Food and Agricultural Policy • Natural Resource Conservation and Public Policy • Intermediary Macroeconomic Theory and Policy • Conceptualizing and Modeling Human-Environmental Interactions • Economic Geography • Economics of Public Choice Theory • Economic Geography • Geographic Information Systems

Extracurricular Activities

University of Maryland Relay for Life, College Park, MD **Sept. 2017 – May 2021**
Executive Director
- Plan, lead, and run executive board meetings focused on organizing cancer advocacy events across campus
- Raised over $30,000 in fundraising efforts for the American Cancer Society and their support programs for cancer
- Managed and operated a budget of over $2,000 for yearly fundraising operations

Mighty Sound of Maryland Marching Band, College Park, MD **Aug. 2017 – May 2021**
Trombone
- Perform at all home football games and many university events with attendance reaching 50,000 people
- Function as a member of a team and attend 20 hours of practice weekly

University of Maryland Pep Band, College Park, MD **Nov. 2017 – May 2021**
Trombone
- Perform at all home basketball games and travels to the Big Ten and NCAA tournaments across the country

Technical Skills

Computer: Power BI, STATA, R, ArcGIS, SQL, Microsoft Excel, PowerPoint, and Word
Professional Social Media: Facebook, Twitter, Instagram
Language: Spanish (basic)

Question:

15. For each existing residential program (energy efficiency, Demand Response, DER, or VPP), please provide the following measured data:

a. The total number of enrolled customers and devices.

b. The average and maximum load reduction achieved during a peak event.

c. The value to the grid delivered, company cost savings, customer incentives.

d. The number of events dispatched in the last 3 years, and the duration of each event called.

e. The dispatch success rate (i.e., the percentage of devices that responded as expected).

f. What criteria are used to trigger a demand response event? Is it based on a pre-determined schedule, or is it in response to realtime grid conditions?

Response:

The Company has provided responses below for its demand response programs. For energy efficiency, please see the Company's annual Energy Waste Reduction Reconciliation filings, the most recent is MPSC Case No. U-21671[1].

a. DR-Enrollment numbers as of 8/18/2025:
STP: 64,117 customers, 67,827 devices
ACPC: 87,403 customers, 87,443 devices
DPP: 198,419 customers (PTR:173,559 / CPP: 24,860)

   Distributed Generation ("DG") - As of July 30, 2025, Consumers Energy has 12,279 customers enrolled in its Distributed Generation Programs (including legacy net metering customers).

b. Please see the Company's response to U21870-GLREA-CE-0283
DG-N/a

c. Customer incentives for Residential DR programs:
   - ACPC: $5 monthly bill credit during the months of June, July, and August.
   - DPP:
     - PTR – incentives are provided as bill credits, based on the energy saved during called DR events. The customer receives $1/kWh curtailed when compared to the baseline (similar weather day conditions) of previous usage.
     - CPP – on average, customers receive between a 10%-20% discount during off-peak consumption in the summer season, compared to the standard residential

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rate. During a Critical Peak Pricing event, customers will be charged a higher rate of $1/kWh for any electricity used during the event window between 2pm-6pm.

- STP: $50 up-front, $25 annual

DG-- From January 1, 2025 to July 30, 2025, Distributed Generation programs have exported 35,263 MWh of excess energy generated to the grid.

d.

Year	Program	# of Events	Time of Events
2022	ACPC	4	4pm-6pm, 2pm-6pm, 2pm-6pm, 2pm-6pm
2022	CPP	5	2pm-6pm (all five events)
2022	PTR	5	2pm-6pm (all five events)
2022	STP	4	2pm-6pm (all four events)
2023	ACPC	1	4pm-7pm
2024	ACPC	2	3pm-7pm, 3pm-5pm
2024	STP	2	3pm-7pm, 3pm-5pm
2025	ACPC	1	2pm-4pm
2025	STP	1	2pm-4pm

DG—N/a

e. DR--

- ACPC
  - i. 2022-2025: 98% dispatched successfully with ZigBee switches each year
- STP
  - ii. 2022: 99.4% dispatched successfully across the four events
  - iii. 2024: 99.4% dispatched successfully across the two events
  - iv. 2025: 99.5% dispatched successfully

DG—N/a

f. DR--

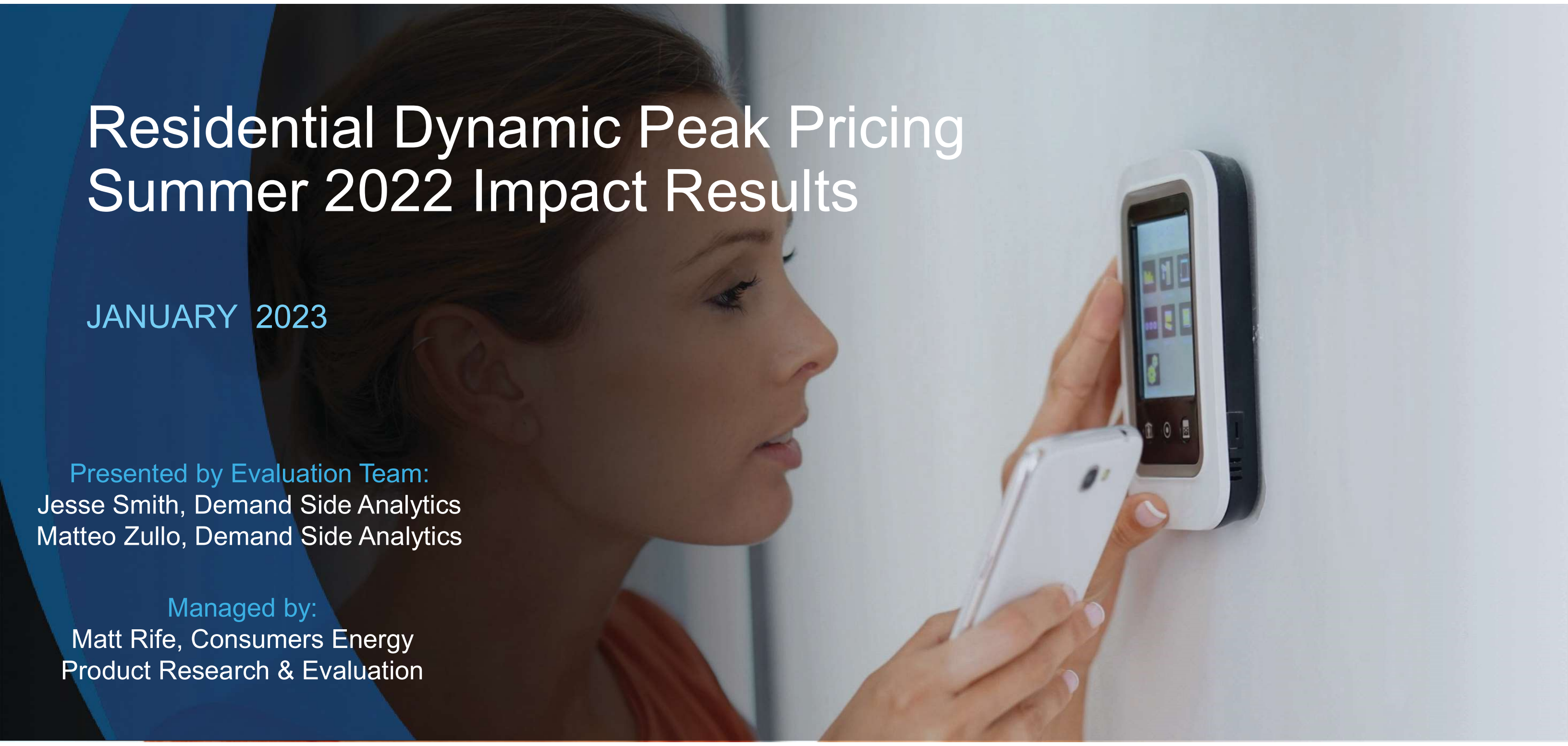
I. Real-time grid conditions and annual MISO LMR testing requirements

II. DR Event Triggers for real-time grid conditions:
  - MISO Operating margin less than 5%
  - MISO peak hour load forecast > 117,500 MW
  - Consumers load of 27,000 MW for four consecutive hours

DG—N/a

Witness: Alex M. Gast
Date: August 27, 2025

CADMUS | Consumers Energy Count on Us® | Demand Side Analytics DATA DRIVEN RESEARCH AND INSIGHTS



Residential Dynamic Peak Pricing Summer 2022 Impact Results

JANUARY 2023

Presented by Evaluation Team:
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Product Research & Evaluation

Research Overview

- **Executive Summary**
- **Load Impacts**
  - Overall
  - By Date
  - By Segment
- **Estimated Performance at Planning Conditions**
- **Participant Bill Impacts**
- **Appendix**
  - A) Segmentation Features
  - B) Detailed Methodology
  - C) Results by Segment
  - D) Bill Impact Methodology
  - E) Historic Performance 2017-2022
  - F) Table Generator

Research Objectives

- What is the average kW reduction per participant?
  - Critical Peak Pricing (CPP)
  - Peak Time Rebate (PTR)
  - Dynamic Peak Pricing (DPP) program as a whole?
- What were the aggregate MW and MWh reductions on Summer 2022 event days?
- How do the load impacts vary?
  - Across event days?
  - Across hours within events?
  - Across customer segments?
- How did DPP participation affect customer bills during Summer 2022?

Executive Summary

Residential Dynamic Peak Pricing
Summer 2022

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Executive Summary

PROGRAM OVERVIEW

The Residential Dynamic Peak Pricing Program (DPP) includes two rates:

Critical Peak Pricing (CPP): discounted off-peak pricing ($/kWh) and elevated pricing during events. Average enrollment during 2022 events was 14,117 accounts.

Peak Time Rewards (PTR): performance incentives ($/kWh) for consumption below a baseline of similar days during event hours. Average enrollment during 2022 events was 77,019 accounts.

Consumers Energy initiated five DPP events during summer 2022. The June 22nd event was called at mild conditions as a precaution and did not meet Consumers Energy's normal dispatch criteria

IMPACTS

The average per-customer impact across the five summer 2022 events was 0.136 kW (7.7%)

- CPP = 0.171 kW or 9.8%. Average summer bill savings was $10.36.
- PTR = 0.125 kW or 7.1%. Average summer bill savings was $9.12.
- Both components saw increased impact compared to summer 2021 evaluation results but fell short of planning values.

DPP achieved 265 MWh of aggregate energy reduction in 2022.

The evaluation found statistically significant differences in kW impacts by **enrollment year** and **communication channel**. Participants enrolled prior to 2021 and those who received text or voice communications delivered the largest kW impacts.

RECOMMENDATIONS

Under planning conditions of 90 °F, **we predict an average per-participant performance of 0.18 kW for CPP and 0.13 kW for PTR**. The assumed planning condition comes from average Michigan temperatures 2pm-6pm during peak-demand days in MISO Load Resource Zone 7 from 2013 to 2021.

Consumers Energy should explore a mechanism to claim 50-60 MWh of Energy Waste Reduction per DPP event.

Consumers Energy should encourage participants to select text message alerts at enrollment and do a campaign with legacy participants encouraging them to sign up for text alerts of Energy Savings Events.

Dynamic Peak Pricing Program Description

DYNAMIC PEAK PRICING (DPP)

Notice: Because events were initiated by Consumers Energy rather than responding to MISO emergencies, participants were given day-ahead notice of each DPP event

Earnings type: Program costs are considered Operation and Maintenance expenses and are therefore eligible for the earnings adjustment mechanism (EAM)

Wholesale recognition: DPP is not awarded Zonal Resource Credits (ZRCs). The events are initiated by the company when forecasted 4-hour load capacity requirements exceed 27,000 MWh in order to reduce the Planning Reserve Margin Requirement (PRMR)

Number of Events: 5 events called out of maximum 14 events in 2022

CRITICAL PEAK PRICING (CPP)

During events: Volumetric charge of $1.00 per kWh consumed during event hours

Off-peak hours: 18% discount on all kWh used outside of 2-7 PM Mon-Fri from June 1st to September 30th

On-peak hours: Standard Summer Peak Rate tariff.

PEAK TIME REWARDS (PTR)

During events: Demand-response reward of $1.00 per kWh reduced from baseline (i.e., average energy use during the same hours in the most recent three similar weather days). No penalty for exceeding the baseline

Non-event hours: Standard Summer Peak Rate tariff applies for all hours.

2022 Event Day Summary

Participant counts, kW impacts, and temperature across the 5 event days

Event Date	Dispatch Trigger	Participants (n)		Average Impacts (kW)		Average Temperature (F)	
		CPP	PTR	CPP	PTR	Daily	2-6 PM
6/15	Economic	13,807	73,682	-0.179	-0.137	83.5	91.2
6/21	Economic	13,926	74,838	-0.215	-0.148	81.7	91.5
6/22*	Precaution	13,942	75,077	-0.152	-0.080	79.8	82.9
7/19	Economic	14,436	80,527	-0.173	-0.137	79.9	87.4
7/21	Economic	14,476	80,970	-0.143	-0.124	78.1	86.3
Average Event (n=5)		**14,117**	**77,019**	**-0.171**	**-0.124**	**80.6**	**87.9**
Average Economic Event (n=4)		**14,161**	**77,504**	**-0.178**	**-0.137**	**80.8**	**89.1**

* The 6/22 event was called as a precaution in response to day-ahead MISO emergency notice. The weather and load conditions did not meet Consumers Energy's normal dispatch criteria

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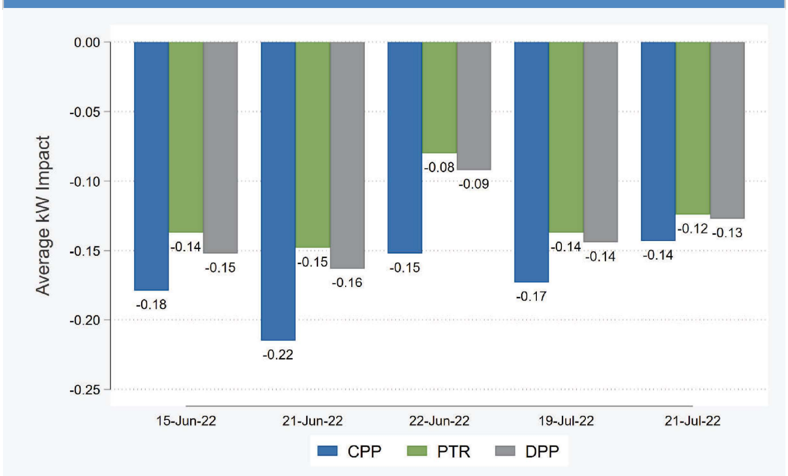
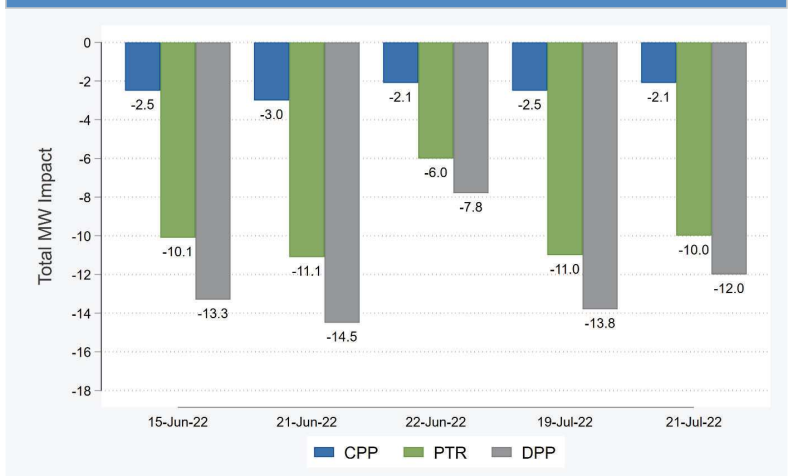
Average Participant and Total MW Impacts by Rate and Date

Per-customer impacts are bigger for CPP, but aggregate impacts are larger for PTR due to number of enrollments

Average Per-customer kW Impacts



Aggregate MW Impacts



* Impacts for the full DPP program were modeled separately from CPP and PTR and may not equal the simple sum of PTR and CPP

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Participant Segmentation

Mutually exclusive customer subcategories adding up to 100% within each segment and program

Customer Shares by Segment			
Segment	**Category**	**CPP**	**PTR**
Dwelling Type	Multi-Family	21%	26%
	Single-Family	79%	74%
Income Status	Not Low-Income	87%	87%
	Low-Income	13%	13%
Enrollment Year	Before 2021	48%	37%
	2021	29%	32%
	2022	24%	32%
Customer Type	Dual-Fuel	36%	37%
	Electric-Only	65%	63%
Communication Channel	E-Mail & Other	30%	34%
	E-Mail Only	59%	48%
	No Email	11%	18%
Educational Email	Did Not Receive	44%	41%
	Received	44%	41%
	Missing	12%	19%

- The regression analysis was conducted separately for each customer segment and weather station
  - ***Enrollment Year*** segments participants by the date of their enrollment (Before 2021, 2021, 2022) to assess potential learning effects or fatigue effects over time
  - ***Communication Channel*** segments participants based on their preferred means of communication regarding DPP events to explore the effectiveness of different communication types.
  - ***Education Email*** segments based on receipt of an education email campaign in spring 2022. Cadmus randomly assigned participants to receive or not receive the emails. The "missing" category indicates participants who enrolled in DPP after the campaign.

Impact Analysis

Overall, By Date, By Segment

Methodology Overview

See *Appendix B* for detailed methods

MATCHING

- Participants are matched with replacement
  1. Choose 5 Proxy Days
     - Hot non-event weekdays where the load shapes of customers are most comparable to event days
  2. Hard matching and soft matching
     - *Hard features*: Defining the subgroups of treatment and control customers matched to each other
     - *Soft features*: Defining the propensity equation used to match treated homes and non-participants within each subgroup

IMPACT ESTIMATES

- Difference-in-Differences Model:

$$\hat{\Delta}_{DID} = \hat{\Delta}^{treat} - \hat{\Delta}^{control} = \left(\widehat{\mathrm{kWh}}^{treat}_{proxy} - \widehat{\mathrm{kWh}}^{treat}_{event}\right) - \left(\widehat{\mathrm{kWh}}^{\mathrm{control}}_{proxy} - \widehat{\mathrm{KWh}}^{control}_{event}\right)$$

- Estimates are obtained via regressions to adjust for other features potentially confounding impact estimates:
  - *Hour & Day Fixed Effects, Lunch Hour Adjustment*

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Average Participant kW Impacts

By Date and Hour

Average Participant Impacts by Event Date and Program Component				
Event Date	**Average Event Temperature (°F)**	**CPP (kW)**	**PTR (kW)**	**DPP (kW)**
6/15	91.2	-0.179	-0.137	-0.152
6/21	91.5	-0.215	-0.148	-0.163
6/22	82.9	-0.152	-0.080	-0.092
7/19	87.4	-0.173	-0.137	-0.144
7/21	86.3	-0.143	-0.124	-0.127
Average Event	**87.9**	**-0.171**	**-0.124**	**-0.135**
Average Excluding 6/22	**89.1**	**-0.179**	**-0.137**	**-0.152**

Average Impacts by Hour and Program Component			
Hour	**CPP (kW)**	**PTR (kW)**	**DPP (kW)**
15	-0.140	-0.102	-0.112
16	-0.170	-0.121	-0.132
17	-0.182	-0.138	-0.150
18	-0.192	-0.138	-0.149

- June 22nd event call was precautionary based on a day-ahead MISO emergency notice. Weather and load conditions did not meet Consumers Energy's typical dispatch criteria

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Average Participant Percent Impacts

By Date and by Hour

Percent Impacts by Event Date and Program Component				
Event Date	Average Event Temperature (°F)	CPP (%)	PTR (%)	DPP (%)
6/15	91.2	-9.4%	-7.2%	-7.9%
6/21	91.5	-11.4%	-8.1%	-8.9%
6/22	82.9	-9.4%	-5.0%	-5.4%
7/19	87.4	-9.8%	-7.8%	-8.2%
7/21	86.3	-8.7%	-7.5%	-7.6%
Average event	**87.9**	**-9.8%**	**-7.1%**	**-7.7%**

Average Percent Impacts by Hour			
Hour	CPP (%)	PTR (%)	DPP (%)
15	-8.7%	-6.3%	-6.9%
16	-10.1%	-7.2%	-7.8%
17	-10.2%	-7.7%	-8.4%
18	-10.1%	-7.3%	-7.8%

Percent impacts are equal to the kW impact divided by the reference load, or baseline

- Reference loads increase over the 4-hour event window. Percent impacts are smallest during the first event hour and relatively consistent across the final three event hours.
- PTR percent impacts were lowest on June 22nd, possibly due to back-to-back events and lower event temperatures

Aggregate MW Impacts

By Date and by Hour: Average kW impacts multiplied by number of participants in each event

Aggregate MW Impacts of Per-Customer Impacts				
Event Date	Average Event Temperature (°F)	CPP (MW)	PTR (MW)	DPP (MW)
6/15	91.2	-2.5	-10.1	-13.3
6/21	91.5	-3.0	-11.1	-14.5
6/22	82.9	-2.1	-6.0	-7.8
7/19	87.4	-2.5	-11.0	-13.8
7/21	86.3	-2.1	-10.0	-12.0
Average Event	**87.9**	**-2.4**	**-9.6**	**-12.4**

Aggregate MW Impacts by Hour			
Hour	CPP (MW)	PTR (MW)	DPP (MW)
15	-2.0	-7.9	-10.2
16	-2.4	-9.3	-12.0
17	-2.6	-10.7	-13.7
18	-2.7	-10.6	-13.6

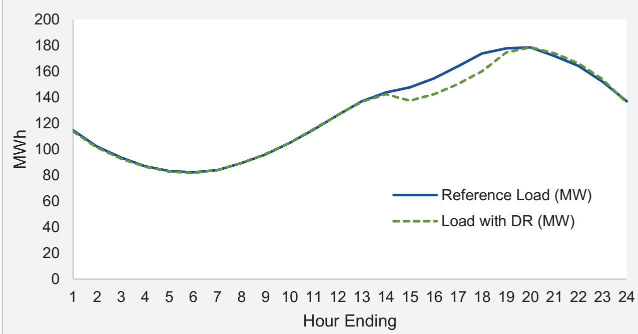
Overall MWh Savings

Energy savings come from load shifted during the event and not recovered before or after

MWh Savings for Each Event and for Season as a Whole

Event Date	Average Event Temperature (°F)	CPP (MWh)	PTR (MWh)	DPP (MWh)
6/15	91.2	7.3	37.9	54.8
6/21	91.5	11.1	40.0	58.1
6/22	82.9	6.6	16.7	22.9
7/19	87.4	14.9	52.4	71.1
7/21	86.3	11.6	47.3	58.3
Season Total	**87.9**	**51.4**	**194.3**	**265.2**

Average Event-Day Load with and without DR: All DPP



Event days led to approximately 50 MWh of aggregate energy savings, on average

- We observed very little snapback or pre-event load increases
- Consumers Energy should consider avenues for claiming these savings as Energy Waste Reduction

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Overall Impacts: Comparison with 2021

Average Impacts are larger, but Maximum Hourly Impacts are Slightly Smaller

Average and Maximum Hourly Impact by Year and Component				
Impact	Year	CPP	PTR	DPP
4-Hour Average	2021	-0.13	-0.09	-0.11
	2022	-0.17	-0.12	-0.14
1-Hour Max	2021	-0.25	-0.21	-0.23
	2022	-0.24	-0.17	-0.19

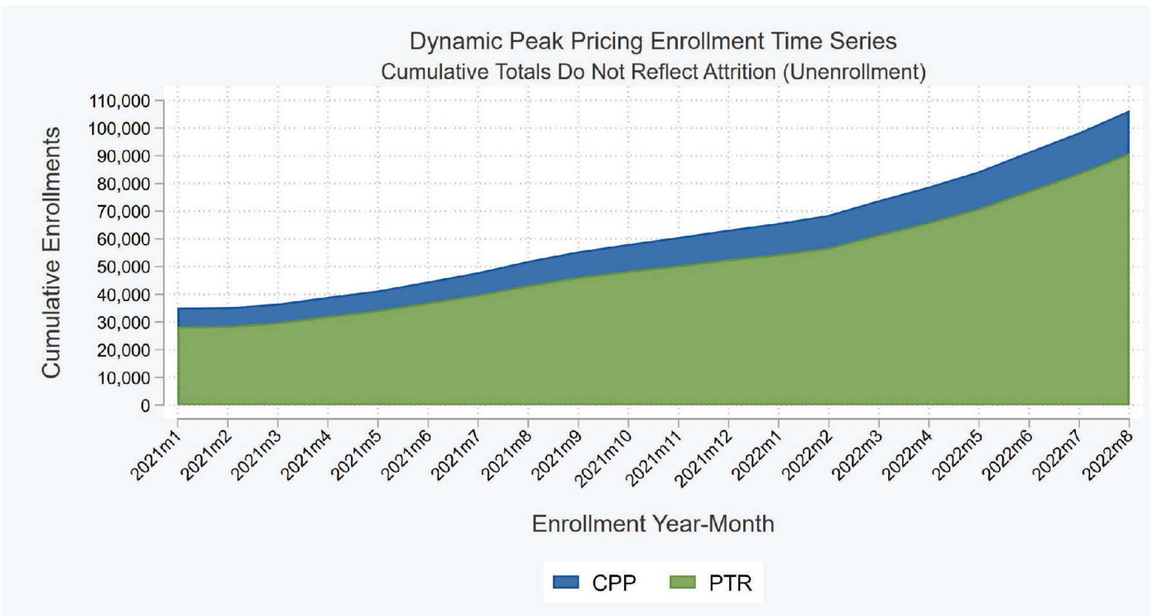
The highlighted values were adopted by Consumers Energy as 2022 planning values

Increased average load impact could be a function of several factors.

- *Methodological*: The 2022 analysis leverages a comparison group of non-participants.
- *Weather Conditions*: Average event temperature was warmer in 2022 than 2021.
- *Fewer events*: There were two more events in 2021. Customer fatigue may have lowered average impacts in 2021.
- *Changing participant mix*: Enrollments nearly doubled in 2022 for DPP and new participants may have different underlying characteristics.

Overall Impacts: Comparison with 2021

Rapid growth in enrollment can cause changes in the customer mix and their characteristics



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Comparison with Planning Values

Summer 2022 load impacts fell short of planning assumptions for both CPP and PTR

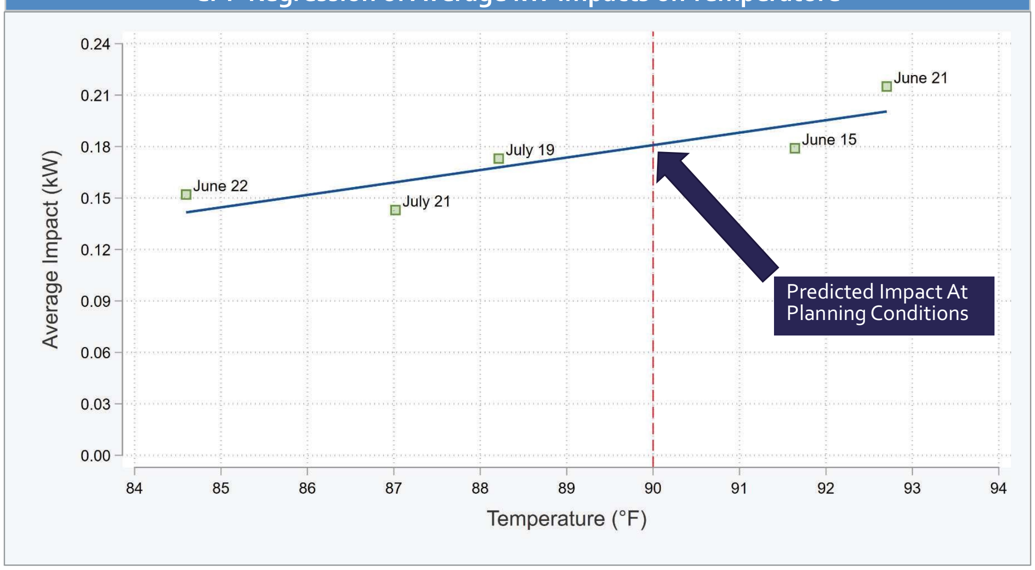
Per-Participant Impacts	CPP (kW)	PTR (kW)
2022 Planning Value	-0.25	-0.21
2022 1-hour Max Impact	-0.24	-0.17
2022 4-hour Average Impact	-0.17	-0.12
Predicted Capability at 90 degrees (F)	-0.18	-0.13

- Each year Consumers Energy projects per-participant kW impacts for each DR program
  - These values are used for a variety of internal and external planning and reporting functions
- The evaluation team's predicted capability values are obtained from a regression analysis of 2022 evaluated impacts against average outdoor event temperature on that day.
- We recommend reviewing expected performance under planning conditions annually to ensure that long term trends are accounted for appropriately if and when they occur – especially if Consumers Energy plans to seek Zonal Resource Credits at MISO

Estimated Performance at Planning Conditions: CPP

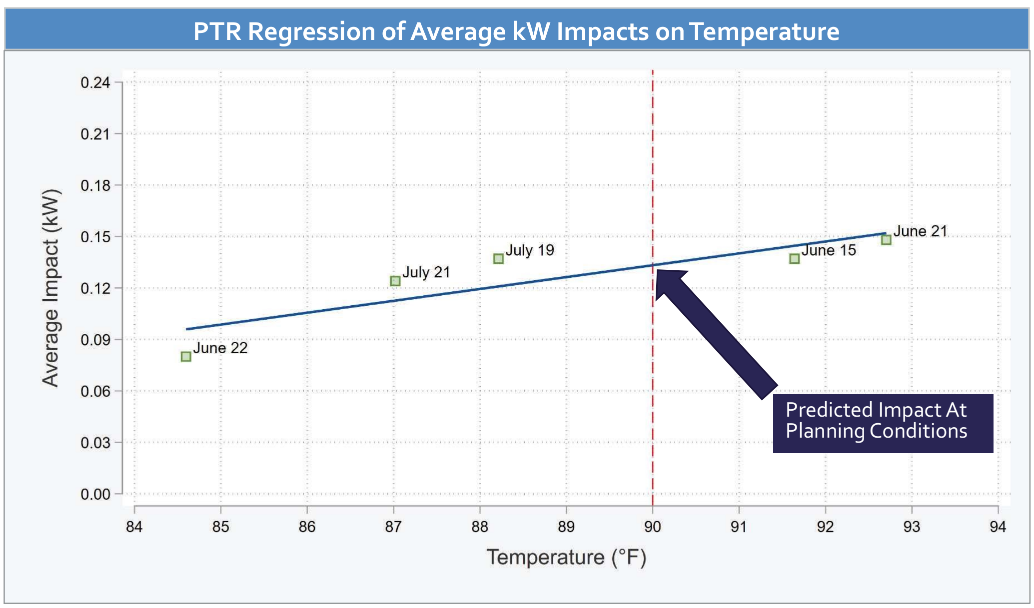
With participant-weighted event temperatures of 90° F, our estimated average impact is **0.181** kW

CPP Regression of Average kW Impacts on Temperature



Estimated Performance at Planning Conditions : PTR

With participant-weighted event temperatures of 90° F, our estimated average impact is **0.133** kW



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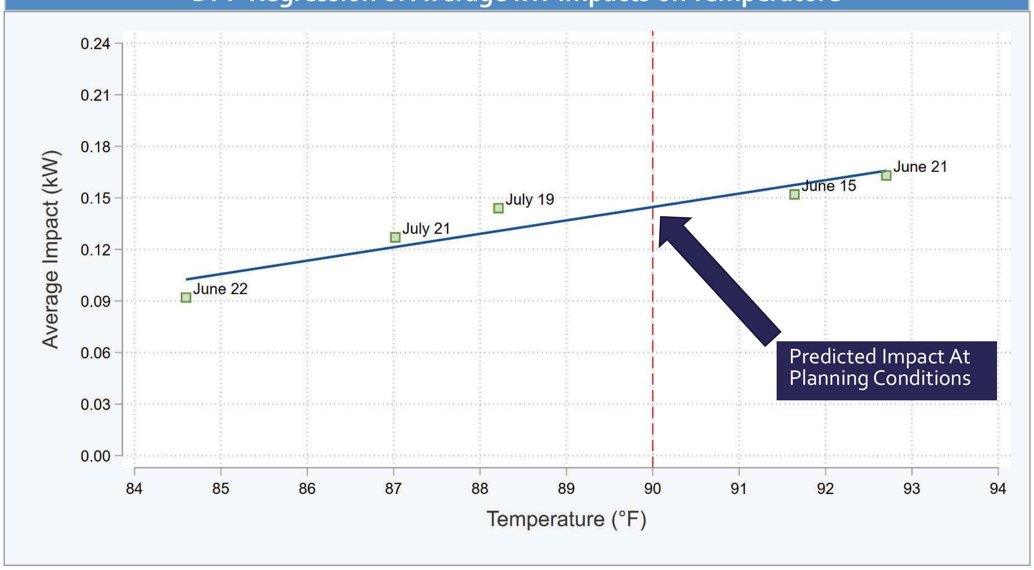
Estimated Performance at Planning Conditions: DPP

With participant-weighted event temperatures of 90° F, our estimated average impact is **0.145** kW

DPP Regression of Average kW Impacts on Temperature



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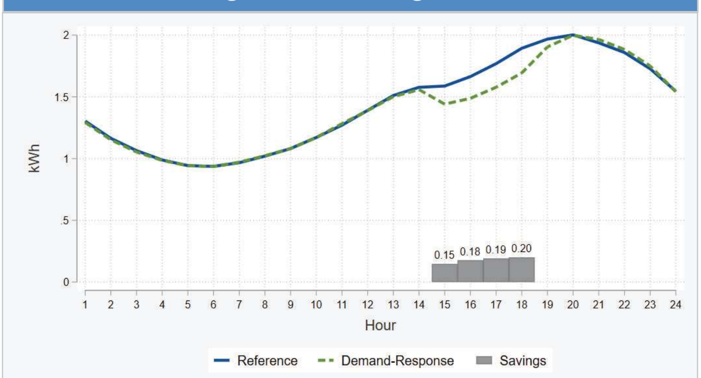
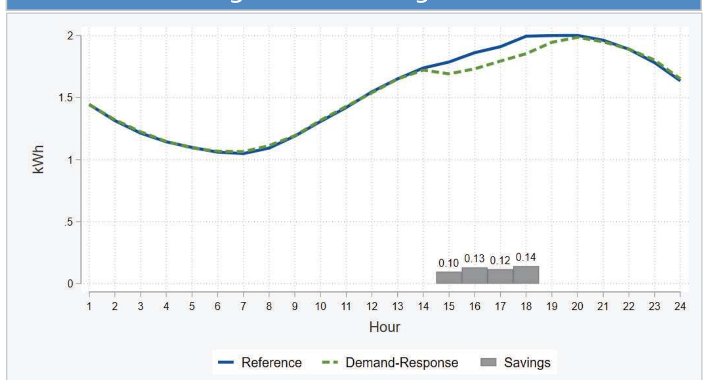
Average Event-Day Impact by Income: CPP

For CPP, low-Income participants delivered smaller demand reductions than not low-income customers.

CPP Impacts: Not Low-Income Customers
Average Event Savings: 0.18 kW



CPP Impacts: Low-Income Customers
Average Event Savings: 0.12 kW

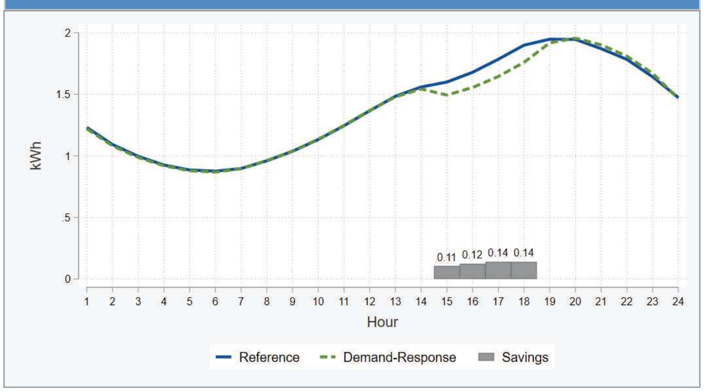


The Income Status (Derived) segmentation feature codes participants as low-income if they are flagged by the Company's low income operand indicator, receive payment assistance, participate in the Consumers Affordable Resource for Energy (CARE) program, or if they have participated in an Income-Qualified EWR program.

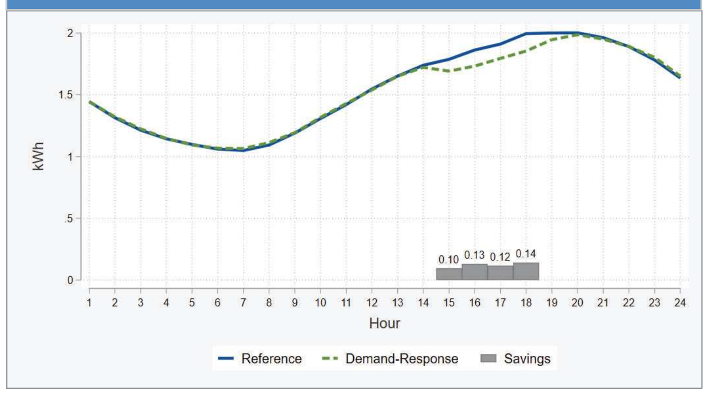
Average Event-Day Impact by Income: PTR

Summer 2022 PTR reductions were more similar between low-income and not low-income customers

PTR Impacts: Not Low-Income Customers
Average Event Savings: 0.13 kW



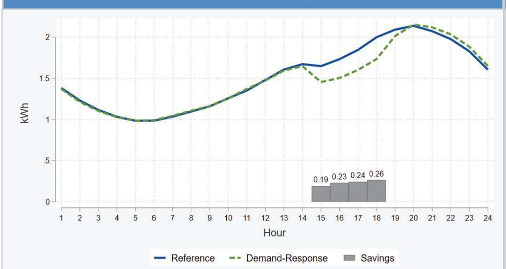
CPP Impacts: Low-Income Customers
Average Event Savings: 0.12 kW



Average Event-Day Impact by Enrollment Year: CPP

Participants who enrolled in 2022 had smaller reference loads and kW reductions than earlier enrollees

CPP Impacts: Before 2021
Average Event Savings: 0.23 kW



CPP Impacts: 2021
Average Event Savings: 0.11 kW

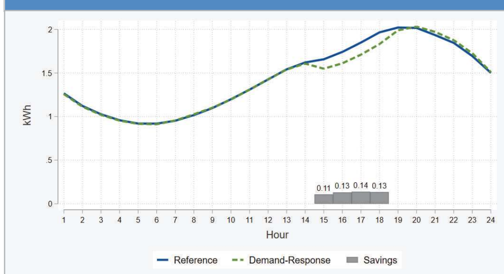
CPP Impacts: 2022
Average Event Savings: 0.12 kW

The differences in average event impact between the “Before 2021” group and the two more recent groups are statistically significant at the 90% confidence level

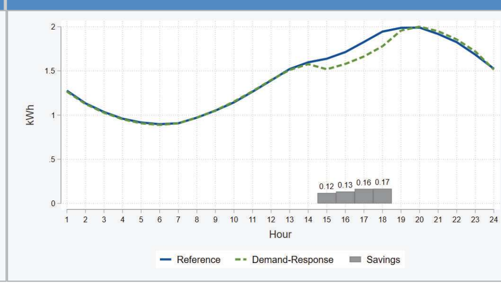
Average Event-Day Impact by Enrollment Year: PTR

The differences by enrollment tenure are less pronounced for PTR

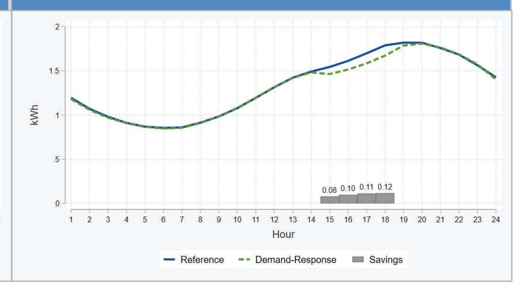
PTR Impacts: Before 2021
Average Event Impact: 0.13 kW



PTR Impacts: 2021
Average Event Impact: 0.15 kW



PTR Impacts: 2022
Average Event Impact: 0.10 kW



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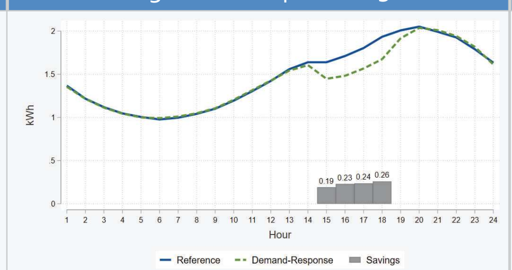
Average Event-Day Impact by Communication Channel: CPP

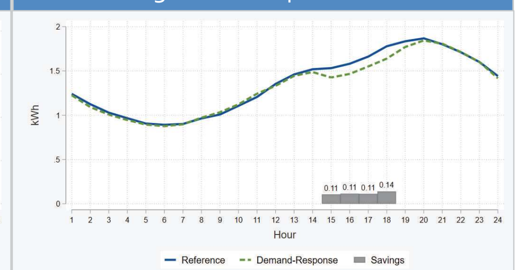
Participants who received text or voice alerts in addition to e-mails delivered larger average kW reductions

CPP Impacts: E-Mail Only
Average Event Impact: 0.15 kW

CPP Impacts: E-Mail & Other
Average Event Impact: 0.23 kW



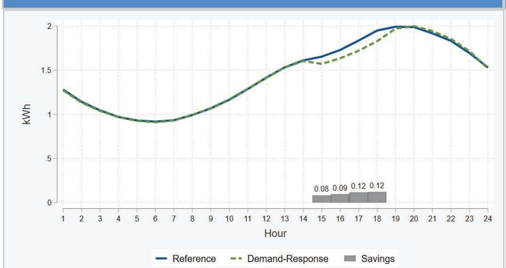
CPP Impacts: No E-Mail
Average Event Impact: 0.12 kW



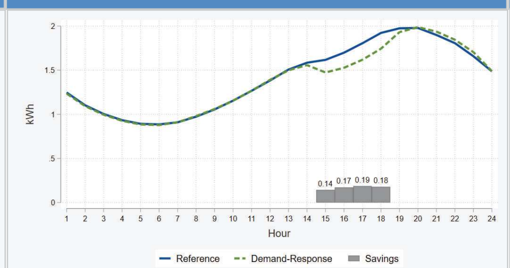
Average Event-Day Impact by Communication Channel: PTR

We see a similar trend for PTR participants receiving text or voice alerts in addition to email

PTR Impacts: E-Mail Only
Average Event Impact: 0.10 kW



PTR Impacts: E-Mail & Other
Average Event Impact: 0.17 kW



PTR Impacts: No E-Mail
Average Event Impact: 0.10 kW

Recommendation: Consumers Energy should promote text alerts during the enrollment process and consider a campaign to existing participants asking them to add text alerts

Participant Bill Impacts

How does DPP participation affect summer electric bills?

Consumers Energy | CADMUS

Participant Bill Impact: Observed vs Counterfactual

CRITICAL PEAK PRICING (CPP)

Time-span: 4 months (Jun-Sep)

Key concept: "Bill without CPP"

- The bill a customer would have faced, had they not been on the CPP rate
- Two counterfactual scenarios: i) adding back shifted load to event consumption and ii) without adding back shifted load

PEAK TIME REWARDS (PTR)

Time-span: 3 months (Jun-August)

- AMI data was not requested for September to limit IT burden

Key concept: Total reduction in electric charges

- The total dollar credits accruing to the customer over the 5 event days in addition to kWh charges not incurred

Counterfactual rate: Summer Peak Rate

- If not enrolled in DPP, customers would be on the default Summer tariff (i.e. Summer Peak Rate)

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Participant Bill Impact: CPP

4-Month Total Impact (June-September)

- Bill Calculation: Example

Hour	(kWh, shift)	W/ CPP	W/o CPP - Not Adding Load	W/o CPP - Adding Load
Off, No Event	**2.0**, 0.5	(\$0.100 - \$0.015 + \$0.059) * **2.0** = **\$0.288**	(\$0.100 + \$0.059) * **2.0** = **\$0.318**	(\$0.100 + \$0.059) * **2.0** = **\$0.318**
On, No Event	**2.0**, 0.5	(\$0.149 + \$0.059) * **2.0** = **\$0.417**	(\$0.149 + \$0.059) * **2.0** = **\$0.417**	(\$0.149 + \$0.059) * **2.0** = **\$0.417**
Event	**2.0**, **0.5**	(\$1.00 + \$0.059) * **2.0** = **\$2.118**	(\$0.149 + \$0.059) * **2.0** = **\$0.417**	(\$0.149 + \$0.059) * (**2.0** + **0.5**) = **\$0.521**

- Bill Impact
  - Impact (\$): Total Bill with CPP *minus* total bill without CPP
  - Impact (%): Ratio of dollar impact *over* total bill with CPP
    - Negative impact indicates customer saved money on their electric bill
    - Positive impact indicates the customer experienced a bill increase

Participant Bill Impact: CPP

CPP participants saved an average of $10.36 over the Summer 2022 DPP season

Participant Bill Impact Categories with and without Event Reductions			
Category	**Definition**	**Observed Loads (No Adding Back of Load Impacts)**	**Reference Loads (Adding Back Load Impacts)**
Big Benefiters	**Lowered** summer electric costs by over 5%	19.7%	11.2%
Modest Benefiters	**Lowered** costs by 0-5%	59.7%	53.7%
Modest Non-Benefiters	**Increased** costs by 0-5%	17.6%	24.9%
Big Non-Benefiters	**Increased** costs by over 5%	3.0%	10.2%

- The table above shows the share of CPP participants by benefit category when load impacts are not added back to the bill calculation (observed) and when they are (reference).
  - Approximately 20% of customers lost money during Summer 2022 by being on CPP
  - More CPP participants benefit when bills are computed using observed loads.
  - The Reference Loads columns shows how participants would fare on CPP *absent any conservation behavior* on event days. The natural load shape of a home is an important predictor of bill impact on CPP.
- Appendix C explores these results by segment

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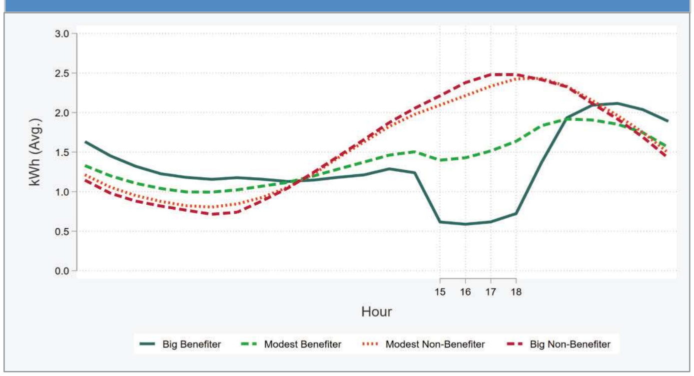
Participant Bill Impact: CPP

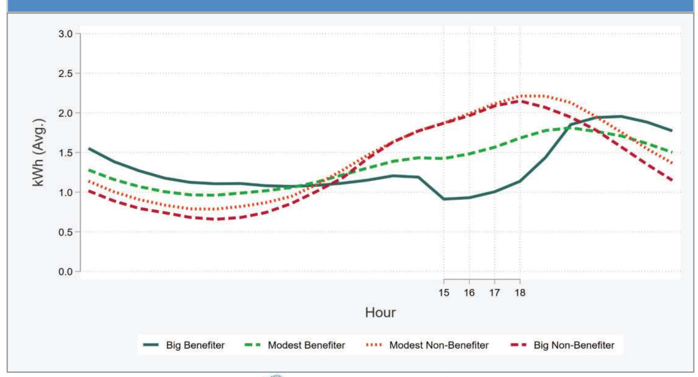
Hourly Load Shapes by Bill Impact Category

- On event days, benefiters responded by decreasing consumption during event hours
  - Big benefiters exhibit large reductions 2-6pm and have a flatter overall load shape
  - Conversely, non-benefiters have a standard residential load shape with no visible notching
- On proxy days, benefiters have smoother load shapes optimizing less aggressively for 2-7 PM prices
  - Conversely, non-benefiters follow a standard residential load shape with less price-optimization

CPP Event-Day Load Shapes



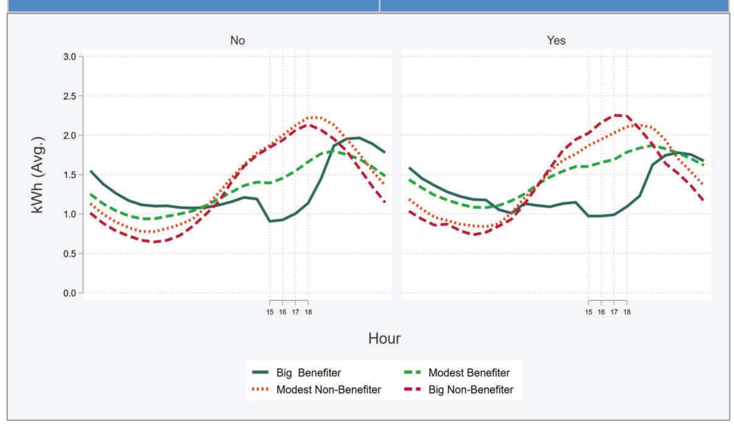
CPP Proxy-Day Load Shapes



Participant Bill Impact: CPP by Income Status

- On event days, both low- and not low-income big benefiters price-optimize
  - Among big benefiters, low-income participants have a less pronounced drop from 2-3pm than non-low income customers
- On proxy days, big-benefiters retain distinctive and more price-responsive load shapes

CPP Event-Day Load Shapes		CPP Proxy-Day Load Shapes	
Not Low-Income	Low-Income	Not Low-Income	Low-Income



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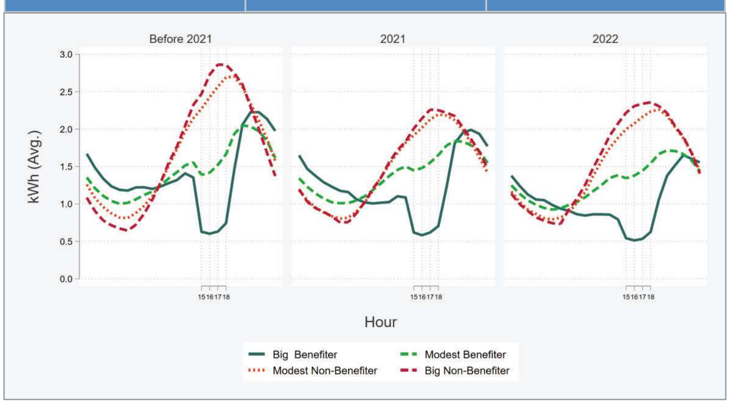
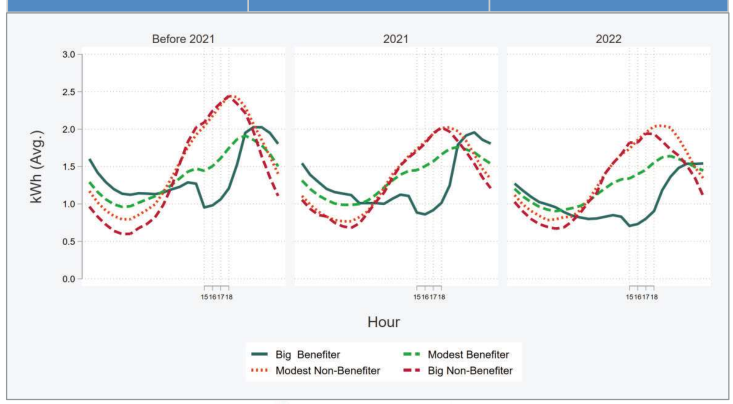
Participant Bill Impact: CPP by Length of Enrollment

- On event days, the three big benefiter cohorts all show distinctive notching from 2pm to 6pm
  - Big benefiters enrolled before 2021 and enrolled in 2021 optimize more than 2022 entrants
- On proxy days, big-benefiters retain more price-optimal load shapes but less so for the 2022 cohort
  - Thus, optimizing behavior seems to improve with enrollment tenure. Early adopters may have the most flexible loads

CPP Event-Day Load Shapes		
Before 2021	2021	2022



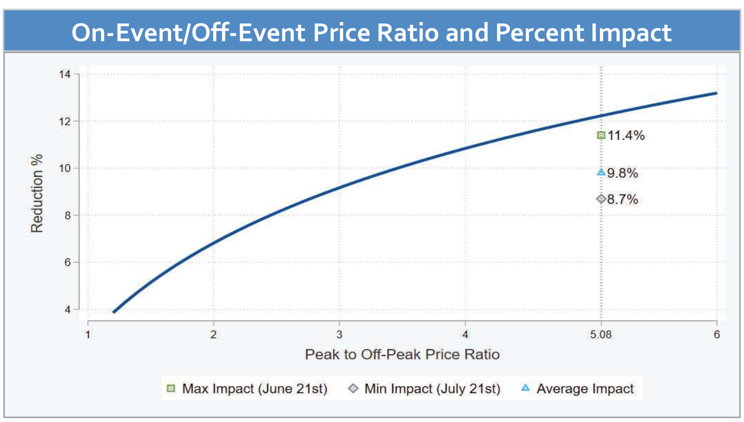
CPP Proxy-Day Load Shapes		
Before 2021	2021	2022



How do CPP Impact Compare to Industry Literature?

The Brattle Group's "Arcturus" curve estimates percent reduction as a function of price ratio

- The Arcturus (2017) meta-analysis of several hundred time-varying rate programs is widely cited. It is a useful benchmark, although it glosses over many important program-specific details
  - The x-axis captures the ratio between on-peak and off-peak price.
  - The y-axis captures the percent reduction household energy consumption
- The CPP rate broadly comports with the literature (range 8.7-11.4%)
  - The 5.08 CPP ratio is the all-in rate during events ($1.059076) relative to the default afternoon Summer peak charge ($0.208331)



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Participant Bill Impact: PTR

3-Month Total Impact (June-August*)

PTR BILL IMPACT CALCULATIONS ARE SIMPLER THAN CPP CALCULATIONS

- Volumetric energy charges
  - *Off-peak*: kWh * ($0.100070 + distr.)
  - *Peak/Event*: kWh * ($0.149255 + distr.)
  - Total Bill: ∑Hourly charges + 3 * (Monthly Fixed charge)
- Rebate (%)
  - Rebate (%) = ∑rebates / total bill
    - PTR credit data was available for all event days and was added back to the total Summer 2022 bill

* AMI data was not requested for September because there were no PTR event days and PTR participants do not receive reduced off-peak pricing like CPP

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Participant Bill Impact: PTR

3-Month Impact (September AMI data not required for analysis)

Event Date	Share of Participants Awarded a $0.00 Bill Credit
6/15	33.5%
6/21	38.7%
6/22	35.3%
7/19	43.9%
7/21	39.7%

Statistic	2022 Rebate Total ($)	Summer 2022 Bill Savings (%)
25th Percentile	$2.92	0.8%
Median	$6.53	2.1%
Mean	$9.12	2.7%
75th Percentile	$12.37	4.1%

- PTR participants saved an *average* of $9.12 on their summer 2022 electric bills
- The *most common* event-specific bill credit was $0, with a long right tail
- The median 2022 bill savings was 2.1% of June through August electric charges and the mean was 2.7%.
  - Most PTR participants fit into the "modest benefiters" category (i.e., saved 0-5%)
  - Including September bills would lower the percent impact but not the absolute ($) impact

Participant Bill Impact: PTR

3-Month Impact by Segment: Segments fare similarly, but low-income participants rebated <3 % of bill

Bill Savings by Segment at 25th, 50th, and 75th Percentile: PTR Credits + Avoided kWh Purchase as % of June through August Bills

SEGMENT	CATEGORY	Bill Savings ($)			Bill Reduction (%)		
		25th	50th	75th	25th	50th	75th
Dwelling Type	Multifamily	$2.65	$5.73	$10.43	1.1%	2.5%	4.6%
	Single-Family	$3.04	$6.90	$13.16	0.8%	2.0%	3.9%
Income Status	Not Low-Income	$3.03	$6.63	$12.52	0.9%	2.2%	4.2%
	Low-Income	$2.27	$5.78	$11.29	0.7%	1.7%	3.4%
Enrollment Year	Before 2021	$3.20	$6.91	$12.98	0.9%	2.1%	4.0%
	2021	$3.62	$7.18	$13.22	1.0%	2.3%	4.3%
	2022	$2.03	$5.63	$11.06	0.7%	2.0%	4.0%
Customer Type	Dual-Fuel	$2.01	$5.25	$10.62	0.6%	1.6%	3.3%
	Electric-Only	$2.72	$5.48	$10.04	0.8%	1.8%	3.5%
Communication Channel	E-Mail & Other	$2.86	$6.44	$12.18	0.8%	2.0%	3.8%
	E-Mail Only	$3.60	$7.36	$13.62	1.0%	2.3%	4.2%
	No Email	$2.04	$5.43	$10.74	0.8%	2.3%	5.0%
Educational E-Mail	Did Not Receive	$3.50	$7.12	$13.22	1.0%	2.2%	4.1%
	Received	$3.48	$7.10	$13.05	1.0%	2.2%	4.1%
	Missing	$1.56	$4.98	$10.02	0.6%	1.9%	4.0%

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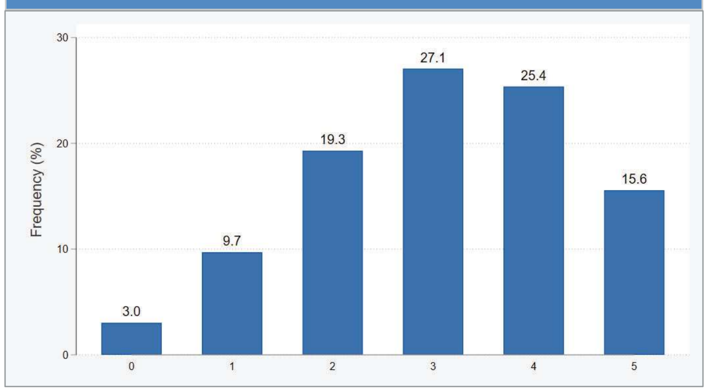
Participant Bill Impact: PTR

Summer 2022 Bill Impact: Consumers Energy issued over $680,000 of PTR bill credits in 2022

- The average participant earned $7.55 worth of PTR credits during summer 2022
  - They also avoided $1.57 of on-peak energy purchases due to curtailed consumption on event days
  - Total bill impact = $7.55 + $1.57 = $9.12
- Zero-rebates, with and without event enrollment:
  - 5% of all participants earned no bill credits
    - 3% of participants who were enrolled for all five events earned no bill credits
- The number of non-zero rebates approximates a normal distribution

Number of Non-Zero Rebates Awarded Among Participants Enrolled in All Five Events.



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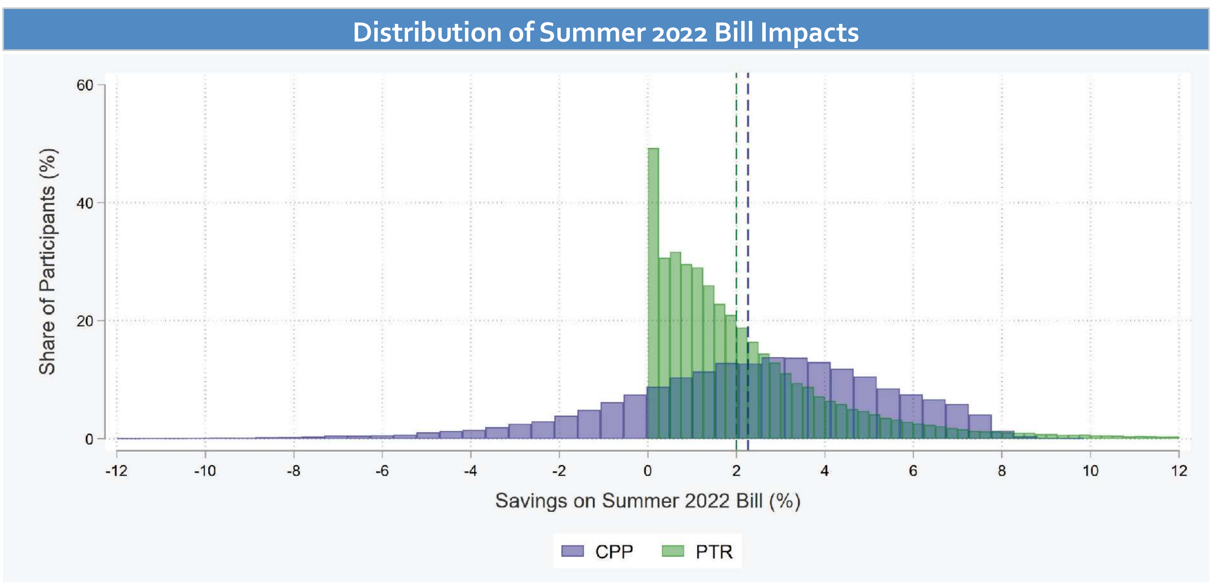
CPP and PTR Average Bill Impacts (Dashed Lines) are Similar

The distribution is much wider for CPP; 98% of CPP participants saved between -3.1% and 16.1% during summer 2022.



Note: September Bills Estimated for PTR

Appendix

Methodology and Table Generator

Appendix A. Segmentation Features

Mutually exclusive customer subcategories adding up to 100% within each segment and program

Customer Shares by Segment					
SEGMENT	CATEGORY	CPP	CPP (%)	PTR	PTR (%)
Dwelling Type	Multi-Family	2,938	21%	20,184	26%
	Single-Family	11,179	79%	56,835	74%
Income Status (Derived)	Not Low-Income	12,330	87%	66,733	87%
	Low-Income	1,788	13%	10,285	13%
Income Status (Operand)	Not Low-Income	12,700	90%	68,881	89%
	Low-Income	1,418	10%	8,137	11%
Enrollment Year	Before 2021	6,736	48%	28,120	37%
	2021	4,026	29%	24,277	32%
	2022	3,355	24%	24,622	32%
Weather Station	Bishop Intl Airport	2,527	18%	15,038	20%
	Capital City Airport	2,074	15%	11,149	15%
	Cherry Capital Airport	848	6%	3,661	5%
	Gerald R Ford Intl Airport	5,091	36%	27,503	36%
	Muskegon County Airport	1,334	9%	6,841	9%
	Pellston Regional Airport	240	2%	1,167	2%
	Roscommon County Airport	1,477	11%	8,592	11%
	Toledo Express Airport	527	4%	3,066	4%
Customer Type	Dual-Fuel	5,011	36%	28,292	37%
	Electric-Only	9,107	65%	48,726	63%
Communication Channel	E-Mail & Other	4,266	30%	25,949	34%
	E-Mail Only	8,275	59%	36,926	48%
	No Email	1,576	11%	14,143	18%
Educational E-Mail	Did Not Receive	5,905	44%	30,110	41%
	Received	5,895	44%	30,115	41%
	Missing	1,576	12%	14,144	19%

Focus: Income Status

The two variables identifying low-income customers follow different coding conventions. The *Income Status (Derived)* variable is more comprehensive using information from several legacy indicators.

- *Income Status (Derived)*: Codes any customers who are flagged on one or more of the following variables: low income operand indicator, payment assistance, Consumers Affordable Resource for Energy (CARE) Program, or Income Qualified EWR participation.
- *Income Status (Operand)*: Relies exclusively on the low-income operand.

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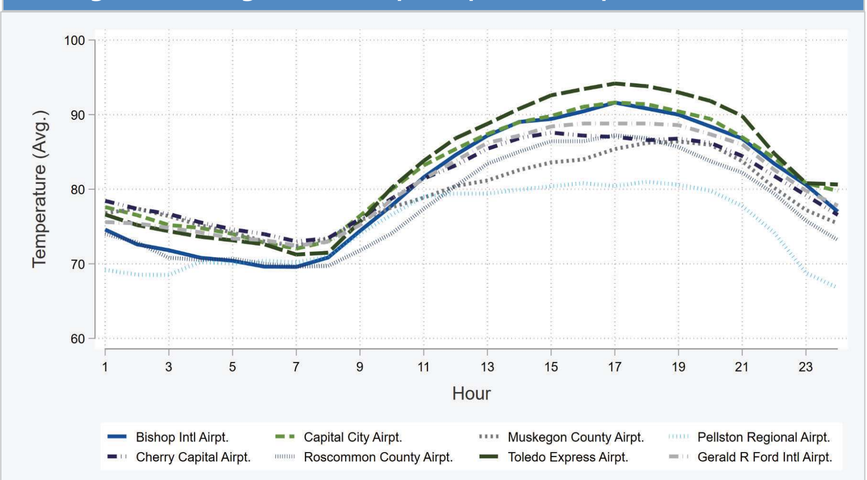
Appendix A. Segmentation Features: Weather Stations

Participant-weighted average temperatures from eight weather stations

- Each participant was matched to one of 8 weather stations based on ZIP code
  - Temperatures in southern Michigan tend to be warmer than northern Michigan

Weighted Average Event-Day Temperature By Weather Station



Stations to ZIPs mapping

Appendix B. Methodology: Matching with Replacement

Hard match *across* segments and soft match *within* segments

Choose Proxy Days

- **Comparison Group**
  - 20,000 Non-participants
- **Matching on 5 baseline days**
  - June 16th, 30th
  - July 18th, 20th, 22nd
- **Baselines are event-like days**
  - They are 5 Summer 2022 hot non-event weekdays chosen such that the average daily temperature is the closest to the 5 event days

Hard Matching

- **Purpose**
  - Stratification
- **Features**
  - *Dwelling Type, Weather Station*
- **Precision**
  - Exact: The soft matching via propensity scores occurs within the strata defined by the hard matching features. Hence, each participant is matched to a control with the same dwelling type and weather station

Soft Matching

- **Purpose**
  - Within-segment propensity score matching
- **Model features**
  - *Load shape, kWh1-24* (1.03% Mean Abs. Percentage Error)
- **Model selection**
  - 22 models tested
  - All models ranked by Absolute Percentage Bias Reduction
  - Of the 3 lowest-bias models, best model picked using Mean Absolute Percentage Error

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Appendix B. Methodology: Regressions

Samples and AMI data used for the different regressions

Average Participant kW Impacts

- Event-day impacts are obtained from separate regressions on 6 days (i.e., the event day and the 5 proxy days)
- Average event impacts across all 5 events are obtained from separate regressions on 10 days: (i.e., the 5 event days and the 5 proxy days)
- Overall DPP impacts come from independent regressions including both CPP and PTR participants as treatments and their matched controls from the comparison group

MW impacts

- For MWh aggregates, DPP was modeled separately and differs from straight summation of PTR and CPP
  - For example, the June 15th 13.34 MW impacts differ from the sum of CPP and PTR (2.47 + 10.13 = 12.60 MW)
  - For example, the June 15th 54.78 MWh savings differ from the sum of CPP and PTR (7.29 + 37.94 = 45.23 MWh)

06/22 Event

- The 6/22 event was called as precautionary based on a day-ahead MISO alert dispatched on 6/21

Appendix B. Methodology: Matching with Replacement

Hard match *across* segments and soft match *within* segments

- Absolute Percentage Bias Reduction (APBR) is used to rank-order the 22 models
  - The models use combinations of the predictors: *consumer load shape*, *percentile rank of household energy consumption*, *average and standard deviation of hourly consumption*, *average energy consumption hours 1-24*
- Mean Absolute Percentage Error (MAPE) is used to pick the best out of the 3-highest ranked models
  - Model 6 is selected for both PTR and CPP (see table below), including the predictors *consumer load shape*, *average energy consumption hours 1-24*
  - Although model 7 has marginally lower MAPE than model 6 for CPP, model 6 is simpler was preferred to use the same matching model for the two program components and ensure consistency

	PTR		CPP	
Model	APBR	MAPE	APBR	MAPE
6	0.7%	0.0%	1.0%	0.1%
7	0.9%	0.0%	1.1%	0.4%
9	0.7%	0.1%	0.8%	0.4%
8	0.8%	0.1%	1.2%	0.5%
18	1.0%	0.7%	1.0%	0.6%

Table: Model Bias. Performance of models with different covariates by measures of Absolute Percentage Bias Reduction (APBR) and Mean Absolute Percentage Error (MAPE).

Focus: APBR and MAPE

Model selection is conducted on <u>event hours of the proxy days</u>. This is the key period of interest for the subsequent diff-in-diff model.

- *Absolute Percentage Bias Reduction* (APBR). The difference between the average hourly consumption of treated and control customers divided by the average consumption of the treated.
- *Mean Absolute Percentage Error* (MAPE): The absolute difference between the average hourly consumption of treated and controls.

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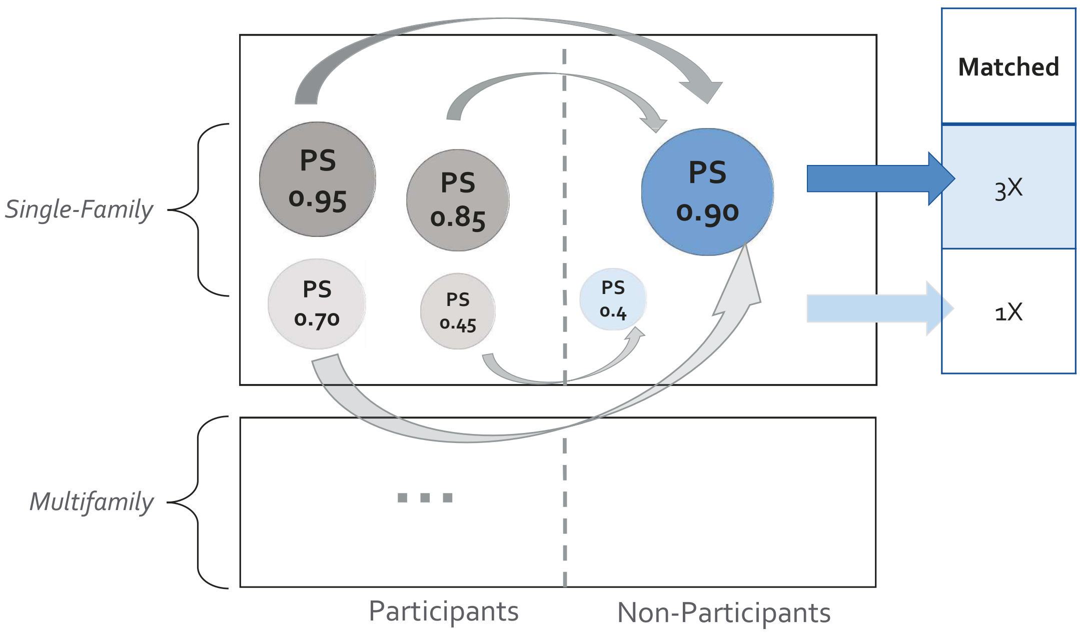
Appendix B. Methodology: Matching with Replacement

Hard match *across* segments and soft match *within* segments



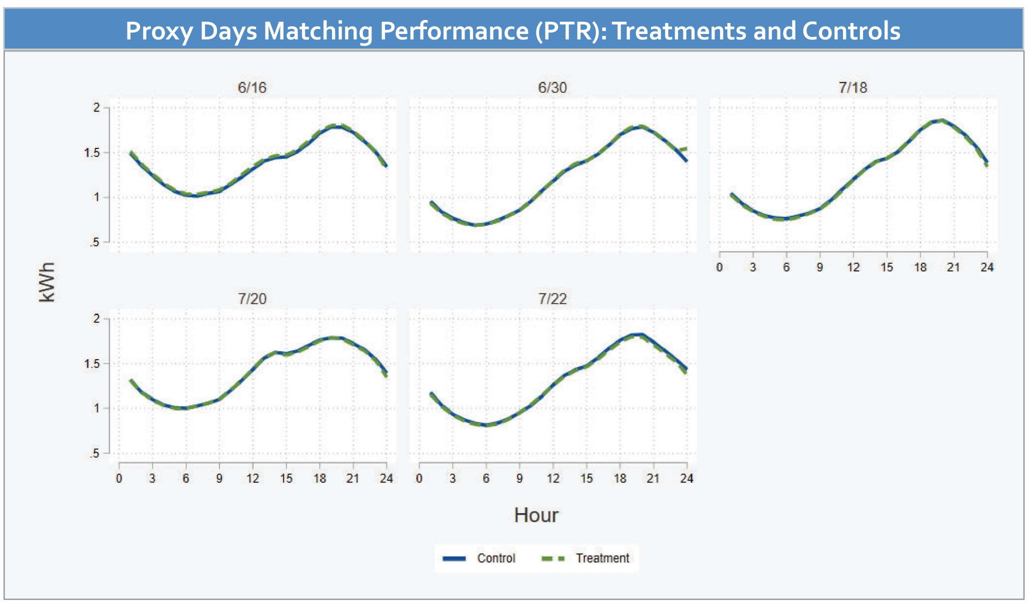
Focus: Propensity score matching

This figure illustrates the propensity score matching. In this method, a propensity score (PS), is calculated for each unit in the treatment and control groups and represents the probability of belonging to the treatment group. PS scores are used to match control and treated units in a pairwise manner by assigning each treatment to the control with the closest PS score.

Additionally, the figure depicts how hard matching features are used to segment the sample before matching. These features are used to divide the sample into subsets, and the matching is then performed within each subset. In this example, we hard-match on customer type: single-family controls can only be matched with single-family treatments, and multi-family controls can only be matched with multi-family treatments.

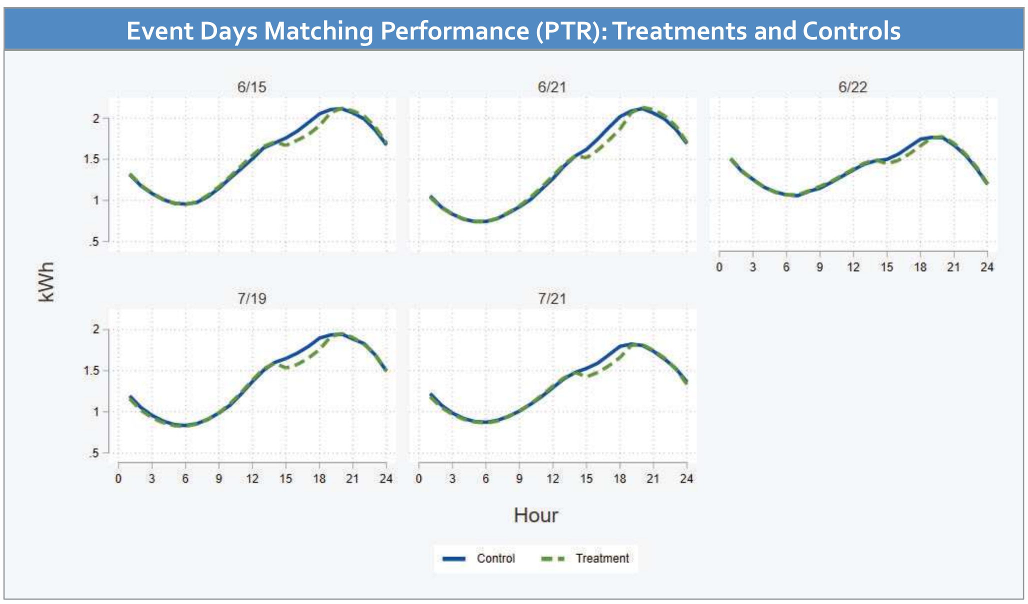
Appendix B. Methodology: Matching with Replacement

Hourly Load shapes of Participants and Matched Non-Participants on Proxy Days: PTR Illustration



Appendix B. Methodology: Matching with Replacement

Hourly Load shapes of Participants and Matched Non-Participants on Event Days : PTR Illustration



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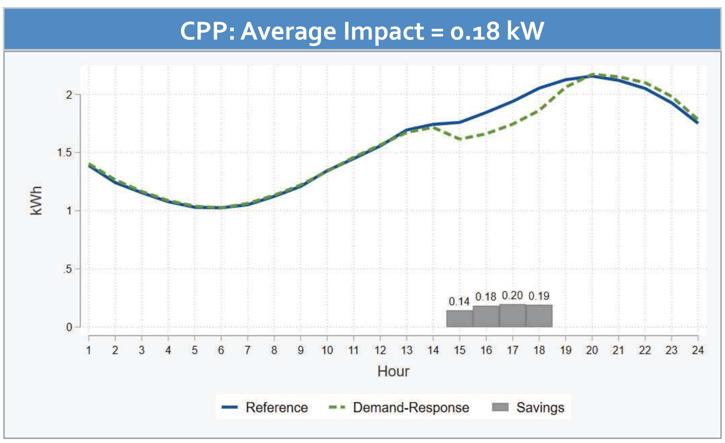
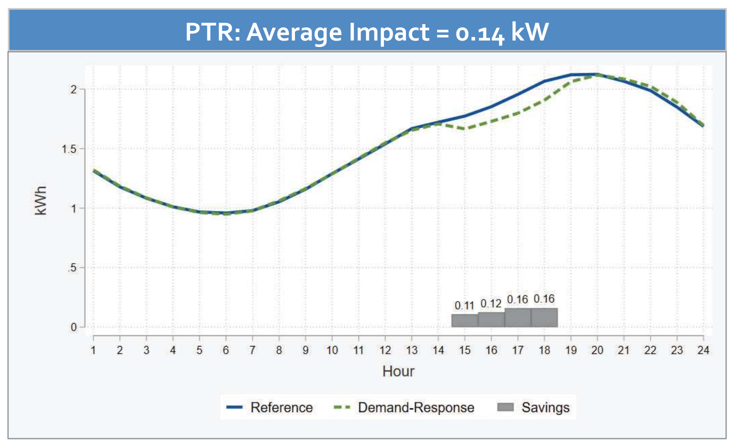
Appendix C. Per-Customer Impacts: By Event Day

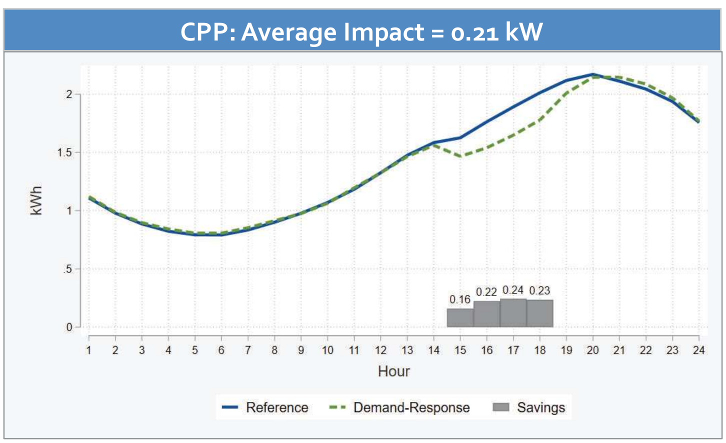
June 15th

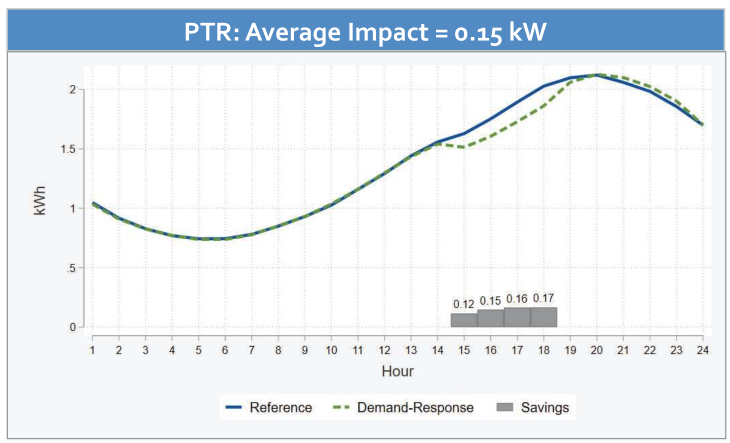




Appendix C. Per-Customer Impacts: By Event Day

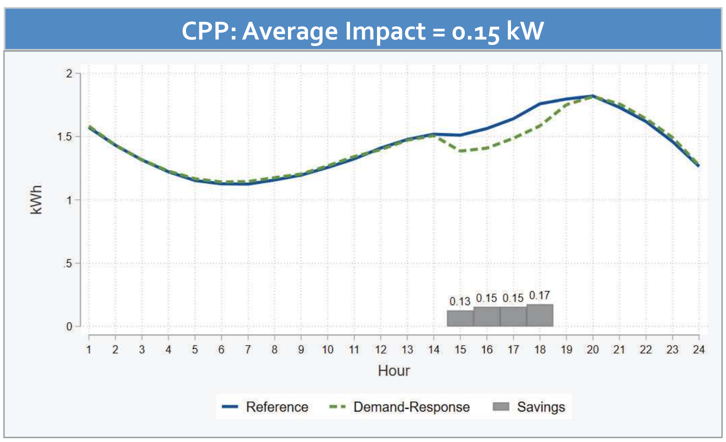
June 21st

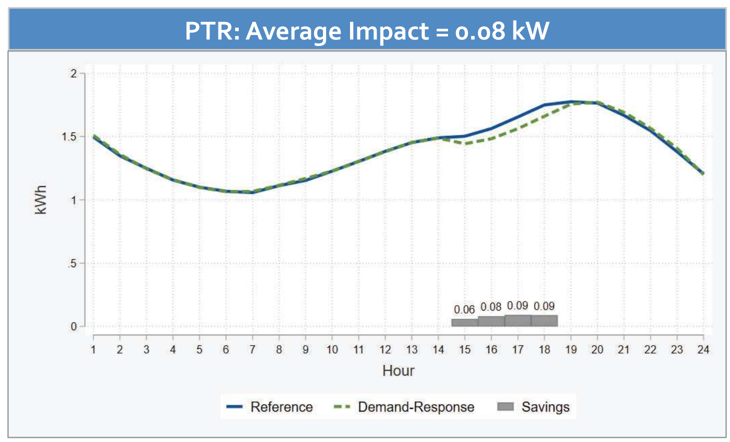




Appendix C. Per-Customer Impacts: By Event Day

June 22nd





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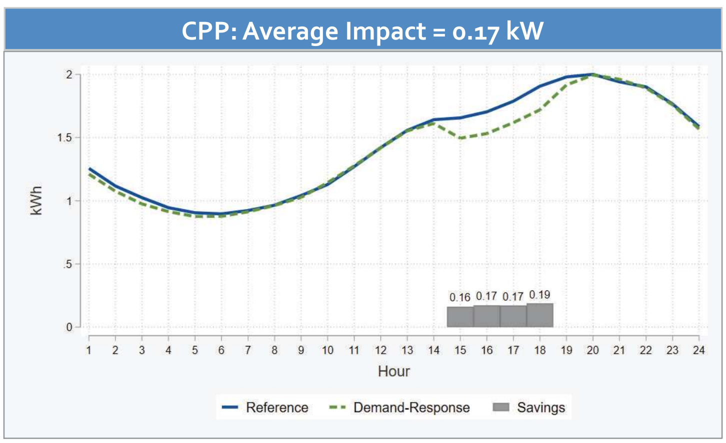
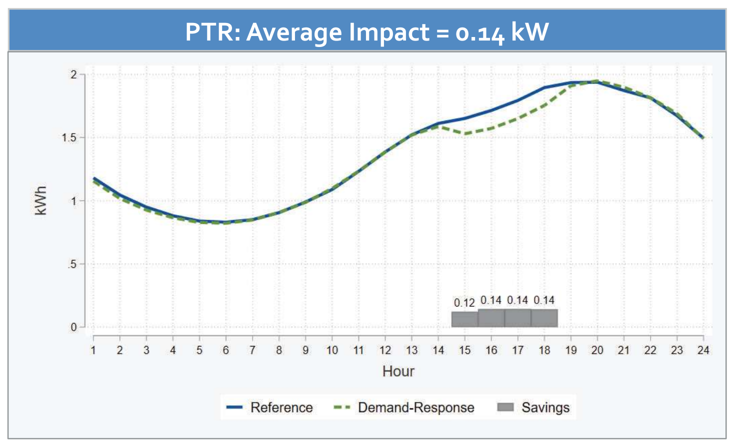
Appendix C. Per-Customer Impacts: By Event Day

July 19th





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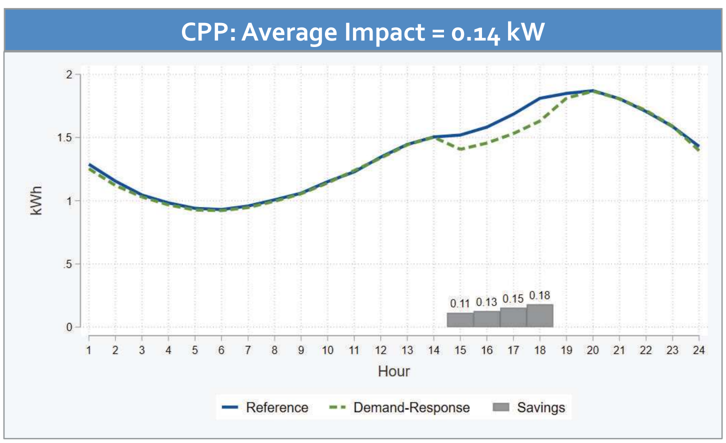
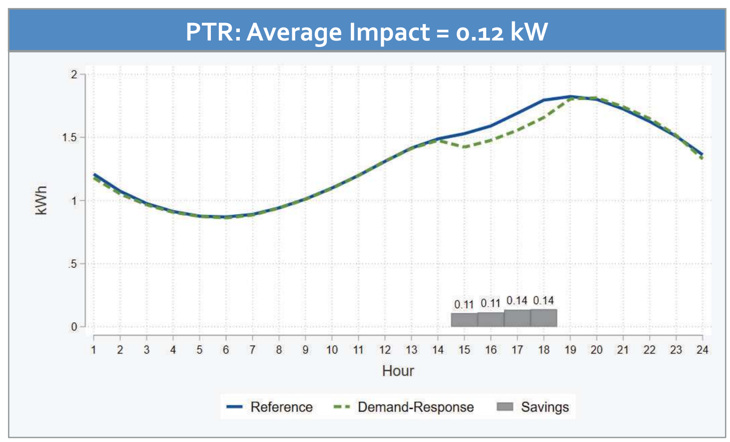
Appendix C. Per-Customer Impacts: By Event Day

July 21st





Appendix D. Participant Bill Impact (CPP)

Bill with CPP and without CPP (*not Adding* Shifted Load)

WITH CPP RIDER

- Volumetric Energy Charge – varies by hour
  - *Off*: kWh × ($0.100070 **- $0.015226** + distr.)
  - *Peak*: kWh × ($0.149255 + distr.)
  - *Event*: kWh × (**$1.00** + distr.)
- Monthly Bill
  - ∑energy charges + Fixed charge
- Total Summer Bill
  - ∑monthly bills

*distribution charge = $0.059076 per kWh

WITHOUT CPP RIDER

- Volumetric Energy Charge – varies by hour
  - *Off*: kWh × ($0.100070 + distr.)
  - *Peak*: kWh × ($0.149255 + distr.)
  - *Event*: kWh × ($ 0.149255 + distr.)
- Monthly Bill
  - ∑energy charges + Fixed charge
- Total Summer Bill
  - ∑monthly bills

Appendix D. Participant Bill Impact (CPP)

Bill with CPP and without CPP (*Adding* Shifted Load)

WITH CPP RIDER

- Volumetric Energy Charge – varies by hour
  - *Off*: kWh × ($0.100070 **- $0.015226** + distr.)
  - *Peak*: kWh × ($0.149255 + distr.)
  - *Event*: kWh × (**$1.00** + distr.)
- Monthly Bill
  - ∑energy charges + Fixed charge
- Total Summer Bill
  - ∑monthly bills

*distribution charge = $0.059076 per kWh

WITHOUT CPP RIDER

- Volumetric Energy Charge – varies by hour
  - *Off*: kWh × ($0.100070 + distr.)
  - *Peak*: kWh × ($0.149255 + distr.)
  - *Event*: (kWh - **kWh impact**) × ($ 0.149255 + distr.)
- Monthly Bill
  - ∑energy charges + Fixed charge
- Total Summer Bill
  - ∑monthly bills

Appendix D. Participant Bill Impact (CPP)

Shares are very similar, but big non-benefiters are disproportionately represented in no-email group

Participant Bill Impact Categories by Segment

SEGMENT	CATEGORY	Big Benefiters	Modest Benefiters	Modest Non-Benefiters	Big Non-Benefiters
Dwelling Type	Multi-Family	9.1%	62.7%	23.1%	5.1%
	Single-Family	13.0%	64.6%	19.4%	3.0%
Income Status (Derived)	Not Low-Income	13.1%	63.0%	20.5%	3.4%
	Low-Income	5.9%	72.9%	17.8%	3.4%
Income Status (Operand)	Not Low-Income	13.0%	63.1%	20.4%	3.4%
	Low-Income	4.7%	74.2%	17.6%	3.5%
Enrollment Year	Before 2021	17.0%	63.2%	17.7%	2.1%
	2021	7.5%	64.5%	22.8%	5.2%
	2022	7.3%	66.3%	22.3%	4.1%
Weather Station	Bishop Intl Airport	9.4%	63.3%	23.1%	4.2%
	Capital City Airport	12.8%	62.6%	21.5%	3.2%
	Cherry Capital Airport	17.6%	69.0%	10.9%	2.5%
	Gerald R Ford Intl Airport.	11.7%	62.0%	22.3%	4.0%
	Muskegon County Airport	14.9%	67.6%	15.6%	1.9%
	Pellston Regional Airport	15.0%	74.8%	10.3%	0.0%
	Roscommon County Airport	12.1%	67.7%	17.1%	3.1%
	Toledo Express Airport	10.8%	65.4%	19.9%	3.9%
Customer Type	Dual-Fuel	10.3%	61.9%	23.6%	4.1%
	Electric-Only	13.2%	65.5%	18.2%	3.1%
Communication Channel	E-Mail & Other	11.6%	67.5%	19.6%	1.3%
	E-Mail Only	15.3%	66.8%	16.9%	1.0%
	No Email	6.8%	40.1%	31.8%	21.3%
Educational E-Mail	Did Not Receive	12.6%	64.2%	19.8%	3.4%
	Received	12.9%	64.3%	19.6%	3.2%
	Missing	8.5%	63.9%	23.1%	4.4%

Appendix E. Historical Event Performance 2017-2022

2017-2018						
Event Date	Participants in Sample		Average Demand Impacts (kW)		Peak Demand Impacts (kW)	
	CPP	PTR	CPP	PTR	CPP	PTR
6/14/2017		704		-0.58		-0.65
6/15/2017	1,476	726	-0.54	-0.51	-0.60	-0.57
6/16/2017	1,518	-	-0.33		-0.41	
7/13/2017	1,886	953	-0.44	-0.42	-0.49	-0.46
7/19/2017	1,930	986	-0.69	-0.65	-0.73	-0.73
7/20/2017	1,951	998	-0.57	-0.50	-0.64	-0.59
7/21/2017	1,970	1,007	-0.57	-0.59	-0.61	-0.63
8/2/2017	2,084	1,084	-0.59	-0.51	-0.63	-0.61
8/21/2017	2,294	1,188	-0.48	-0.43	-0.54	-0.52
9/21/2017	2,625	1,383	-0.4	-0.43	-0.42	-0.48
9/22/2017	2,648	1,392	-0.58	-0.57	-0.61	-0.63
9/26/2017	2,672	1,402	-0.48	-0.47	-0.52	-0.53
6/18/2018	7,178		-0.30		-0.33	
7/2/2018	7,204		-0.28		-0.30	
7/5/2018	7,153		-0.31		-0.32	
7/13/2018	7,213		-0.32		-0.34	
8/7/2018	7,294	6,796	-0.22	-0.18	-0.26	-0.20
8/15/2018		6,836		-0.20		-0.22
8/27/2018	7,331	6,896	-0.27	-0.20	-0.30	-0.23
8/28/2018	7,315	6,895	-0.23	-0.20	-0.26	-0.22
9/5/2018	7,348	6,945	-0.28	-0.27	-0.29	-0.29
9/18/2018	7,386	7,036	-0.18	-0.17	-0.20	-0.18

2019-2022						
Event Date	Participants in Sample		Average Demand Impacts (kW)		Peak Demand Impacts (kW)	
	CPP	PTR	CPP	PTR	CPP	PTR
7/18/2019	7,830	16,453	-0.25	-0.25	-0.32	-0.29
7/19/2019	7,916	16,478	-0.32	-0.25	-0.36	-0.27
7/1/2020	7,744	28,591	-0.15	-0.16	-0.19	-0.19
7/2/2020	7,744	28,591	-0.10	-0.13	-0.15	-0.15
7/8/2020	7,744	28,591	-0.24	-0.23	-0.26	-0.26
7/9/2020	7,744	28,591	-0.13	-0.16	-0.21	-0.19
8/26/2020	7,744	28,591	-0.13	-0.09	-0.16	-0.12
8/27/2020	7,744	28,591	-0.10	-0.06	-0.12	-0.07
7/26/2021	7,600	36,881	-0.23	-0.18	-0.25	-0.21
7/27/2021	7,592	37,108	-0.17	-0.15	-0.19	-0.17
7/28/2021	7,605	37,108	-0.11	-0.08	-0.13	-0.10
8/10/2021	7,521	36,604	-0.15	-0.12	-0.20	-0.14
8/24/2021	7,477	36,403	-0.09	-0.03	-0.17	-0.10
8/25/2021	7,476	36,396	-0.15	-0.09	-0.16	-0.10
8/26/2021	7,481	36,392	-0.03	0.01	-0.05	0.00
6/15/2022	13,807	73,682	-0.18	-0.14	-0.20	-0.16
6/21/2022	13,926	74,838	-0.22	-0.15	-0.24	-0.17
6/22/2022	13,942	75,077	-0.15	-0.08	-0.17	-0.09
7/19/2022	14,436	80,527	-0.17	-0.14	-0.19	-0.14
7/21/2022	14,476	80,970	-0.14	-0.12	-0.18	-0.14

Appendix F. MS Excel Table Generator

Quickly visualize results for a specific data or segment of interest

Select from five drop-down menus:

- **Type of Result**
  - Aggregate (MW) or per-customer (kW) results
- **Program Component**
  - "CPP", "DPP", or "All DPP"
- **Category**
  - Choose segmentation variable (e.g., Enrollment Year)
- **Segment**
  - Choose subsegment (e.g., "Before 2021")
- **Date**
  - Choose one of 5 event days or event-day average

Appendix F. MS Excel Table Generator

Allows users to look at results for specific event days and segments

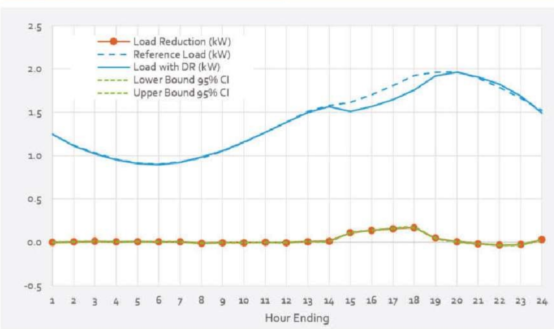
Consumers Energy
2022 Load Impact Evaluation - Residential Dynamic Pricing Program

Table 1: Menu options

Type of Result	Per Customer
Program Component	All DPP
Category	All
Segment	All Customers
Date	Average Event Day

Table 2: Event day information

Total sites	91,137
Daily Max Temp	89.2
Average Impact - kW	0.143
Average Impact - %	8.1%



Hour Ending	Reference Load (kW)	Load with DR (kW)	Load Reduction (kW)	% Load Reduction	Avg Temp (°F, Site-Weighted)	Uncertainty 5th	Uncertainty 95th	Standard Error	T-Statistic
1	1.25	1.25	0.00	0%	75.60	-0.01	0.00	0.00	-0.74
2	1.12	1.11	0.00	0%	74.81	0.00	0.01	0.00	1.87
3	1.03	1.02	0.01	1%	73.87	0.01	0.02	0.00	4.87
4	0.96	0.95	0.01	1%	73.22	0.00	0.01	0.00	2.83
5	0.92	0.91	0.01	1%	72.62	0.00	0.01	0.00	3.54
6	0.90	0.90	0.01	1%	71.99	0.00	0.01	0.00	2.94
7	0.93	0.92	0.01	1%	71.43	0.00	0.01	0.00	2.35
8	0.97	0.98	-0.01	-1%	72.12	-0.01	-0.01	0.00	-4.12
9	1.05	1.06	0.00	0%	74.87	-0.01	0.00	0.00	-1.43
10	1.15	1.15	-0.01	0%	78.05	-0.01	0.00	0.00	-2.29
11	1.27	1.27	0.00	0%	81.03	0.00	0.00	0.00	-0.62
12	1.38	1.39	0.00	0%	83.50	-0.01	0.00	0.00	-3.42
13	1.51	1.50	0.01	1%	85.74	0.01	0.01	0.00	5.42
14	1.58	1.56	0.01	1%	87.16	0.01	0.02	0.00	5.40
15	1.62	1.51	0.11	6.8%	88.12	0.10	0.11	0.00	38.94
16	1.70	1.56	0.14	8.1%	88.68	0.13	0.14	0.00	46.31
17	1.81	1.65	0.16	8.7%	89.22	0.15	0.16	0.00	50.44
18	1.93	1.76	0.17	8.7%	89.03	0.16	0.17	0.00	50.62
19	1.96	1.92	0.05	2%	88.50	0.04	0.05	0.00	13.80
20	1.97	1.96	0.01	0%	87.25	0.00	0.01	0.00	2.05
21	1.89	1.91	-0.02	-1%	85.53	-0.02	-0.01	0.00	-4.69
22	1.79	1.82	-0.03	-2%	82.24	-0.04	-0.03	0.00	-9.04
23	1.66	1.69	-0.03	-2%	79.16	-0.03	-0.02	0.00	-7.85
24	1.52	1.49	0.03	2%	76.96	0.02	0.03	0.00	9.33
Daily	Reference Load (kWh)	Load with DR (kWh)	Energy Savings (kWh)	% Change	Daily Avg Temp (°F)	Adjusted Impact 5th	Adjusted Impact 95th	Standard Error	T-statistic
	33.86	33.23	0.62	2%	80.4	0.60	0.64	0.01	46.79

Question:

13. Please refer to the demand response portfolio described by Company witness Alex Gast on pages 4-5 of his direct testimony. Please describe whether the Company uses the demand response programs in a coordinated manner when events are called. In other words, does the Company respond to events by considering and deploying each program individually or achieve a desired load reduction by deploying the programs in concert?

Response:

For Residential Demand Response the Company typically coordinates the dispatch of those programs, but it does have the ability to pick and choose in the case of an economic event and not an emergency event.

The Company's Commercial & Industrial Demand Response portfolio includes a contractual program and a general interruptible program. When an emergency event is called, both programs are deployed at the same time in a coordinated manner to achieve the required load reduction, with dispatch and measurement handled under each program's rules.

Witness: Alex M. Gast
Date: September 10, 2025

Question:

2. Please reference the Company's response to question 1(a) of U21870-MEIU-CE-0259, which refers to Exhibit A-9 (JRB-3) P. 1-60 in Case No. 21410. On P. 18 of this exhibit, it is stated that "[Cadmus] recommend reviewing expected performance under planning conditions annually to ensure that long term trends are accounted for appropriately if and when they occur."

a. Has Consumers Energy Company reviewed expected performance under planning conditions annually to ensure that long-term trends are accounted for?

b. If the answer to (a) above is yes, please provide all of the information associated with the most recent review that was conducted on expected performance under planning conditions.

c. If the answer to (a) above is no, please explain why an annual review of expected performance has not been conducted.

Response:

a. The Company has not undertaken this review since 2022.

b. N/A

c. No events have been called since 2022. Therefore performance reviews have not been an opportunity.

Witness: Alex M. Gast
Date: September 9, 2025

Question:

3. Please reference the Company's response to question 1(a) of U21870-MEIU-CE-0259, which refers to Exhibit A-9 (JRB-3) P. 1-60 in Case No. 21410. On P. 5 of this exhibit, it is stated that "Consumers Energy should encourage participants to select text message alerts at enrollment and do a campaign with legacy participants encouraging them to sign up for text alerts of Energy Savings Events."

a. Has the Company engaged in any activities or campaigns to encourage customer to sign up for text message alerts?

b. If the answer to (a) above is yes, please provide the specific activities or campaigns that the Company has engaged in.

c. If the answer to (b) above is no, please describe why the Company has not engaged in any activities or campaigns.

Response:

a. Yes.

b. In 2022 the Company informed CPP and PTR customers that voice notifications through phone calls would be retired and asked them to update their contact preferences with a preferred email address. Customers were given the option to select to receive Energy Savings Event notifications through text messages with the phone number on file. While text notifications were offered as an optional communication method, they were not the focus of the outreach.

c. N/A

Witness: Alex M. Gast
Date: September 9, 2025

Question:

12. Please refer to Company witness Gast's direct testimony at p. 14, where he states that "DPP also has the highest rate of low-income enrollments."

a. For the Critical Peak Pricing program, please provide the current amount of low income customers enrolled in the program.

b. For the Peak Time Rewards program, please provide the current amount of low income customers enrolled in the program.

Response:

a. As of 9/4/2025, there are 2,255 low-income customers enrolled in the CPP program.

b. As of 9/4/2025, there are 17,450 low-income customers enrolled in the PTR program.

Witness: Alex M. Gast
Date: September 9, 2025

Question:

1. On P. 14 of Company Witness Gast's Direct Testimony regarding the Company's Dynamic Peak Pricing program, Witness Gast states that "The Company, working with its third-party evaluator Cadmus, predicted a lower capability than the 2022 planning value previously being used. With this lower value being nearly half the previous value for PTR, the Company determined that the credit offered to these customers should also be halved."

a. Please provide all information, including information developed by Cadmus, that the Company utilized to support a proposed reduction in the demand savings amount and the credit value for both the Critical Peak Pricing ("CPP") Program and the Peak Time Rewards ("PTR") Program.

b. Please describe how customer demand savings for the CPP program are calculated and provide all calculations and formulae used for the calculation.

c. Please describe how customer demand savings for the PTR program are calculated and provide all calculations and formulae used for the calculation.

d. Please describe how credit amounts for the PTR program are calculated and provide all calculations and formulae used for the calculation.

e. Please provide all current capability values for the CPP and PTR programs that were calculated/predicted by the Company with its third-party evaluator Cadmus.

   i. Please provide all calculations and formulae used to calculate/predict the current capability values for the CPP and PTR programs.

f. Please provide all 2022 capability values for the CPP and PTR programs that were previously used by the Company.

   i. Please provide all calculations and formulae used to calculate/predict the 2022 capability values for the CPP and PTR programs that were previously used by the Company.

g. Please describe how the current capability value for the CPP program is used to determine the demand savings amount for the CPP program.

h. Please describe how the current capability value for the PTR program is used to determine the demand savings amount and credit amount for the PTR program.

Response:

a. Please see Case No.: U-21410, Exhibit No.: A-9 (JRB-3), Pages 1 through 60 for Residential Dynamic Peak Pricing Summer 2022 Impact Results presentation.

   In 2025, Cadmus conducted an analysis that applied the distribution of impacts and bill credits from summer 2022 events to current program enrollment levels and tested the alternative settlement approaches to help improve program cost-effectiveness.

Reducing PTR Incentives Lowers Bill Credits but Doesn't Fix Payment Asymmetry

Incentive	2022 Season ($1 per kWh)			2025 Season ($1 per kWh)
	Estimated Bill Credits (per event)	Share of Participants Receiving a Bill Credit	Percent Savings (per event)	Simulated Bill Credits (per event)
Current Procedure	$108,208	59%	-	$212,148
Incentive of $0.50 per kWh	$54,104	59%	50.0%	$106,051
Incentive of $0.75 per kWh	$81,156	59%	25.0%	$159,077

Note: Assumes lowering the incentive won't affect how customers save energy.

- Lowering the incentive per kWh saved can achieve **up to 50% in cost savings**, assuming consumer behavior stays the same
- Will customers take the same amount of action for half the money?

10

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b. Cadmus calculates customer demand savings using a difference-in-differences model comparing usage of treatment and control groups and adjusted for potential confounding factors such as hour & day fixed effects. Detailed methodological descriptions can be found in the Residential Dynamic Peak Pricing Summer 2022 Impact Results presentation included with the Company's 2022 DR Reconciliation filing in Case No.: U-21410, Exhibit No.: A-9 (JRB-3), pages 11 and 44-54).

c. Please reference b.

d. DPP has two branches Critical Peak Pricing ("CPP") and Peak Time Rebates ("PTR").

   PTR rebates will be provided based on the energy saved during the DR Event compared to a baseline (CBL) and (similar weather day conditions).

   $1 in bill credits for every kilowatt of electricity customer moves during event window.

   A $3.00 default credit will be provided if we are unable to calculate the customer savings during the event window within 5 calendar days.

e. Please reference the Company's 2022 DR Reconciliation filing in Case No.: U-21410, Exhibit No.: A-9 (JRB-3), page 18).

   i. Detailed methodological descriptions can be found in the Residential Dynamic Peak Pricing Summer 2022 Impact Results presentation included with the Company's 2022 DR Reconciliation filing in Case No.: U-21410, Exhibit No.: A-9 (JRB-3), pages 11 and 44-54).

f. Please reference the Company's 2022 DR Reconciliation filing in Case No.: U-21410, Exhibit No.: A-9 (JRB-3), page 18).

   i. Detailed methodological descriptions can be found in the Residential Dynamic Peak Pricing Summer 2022 Impact Results presentation included with the Company's 2022 DR Reconciliation filing in Case No.: U-21410, Exhibit No.: A-9 (JRB-3), pages 11 and 44-54).

g. Capability values are multiplied by the number of enrolled customers.

h. Like CPP, PTR capability values are multiplied by the number of enrolled customers to get the demand savings amount and the credit amount was set to correspond with the critical peak price for CPP.

Witness: Alex M. Gast
Date: August 26, 2025

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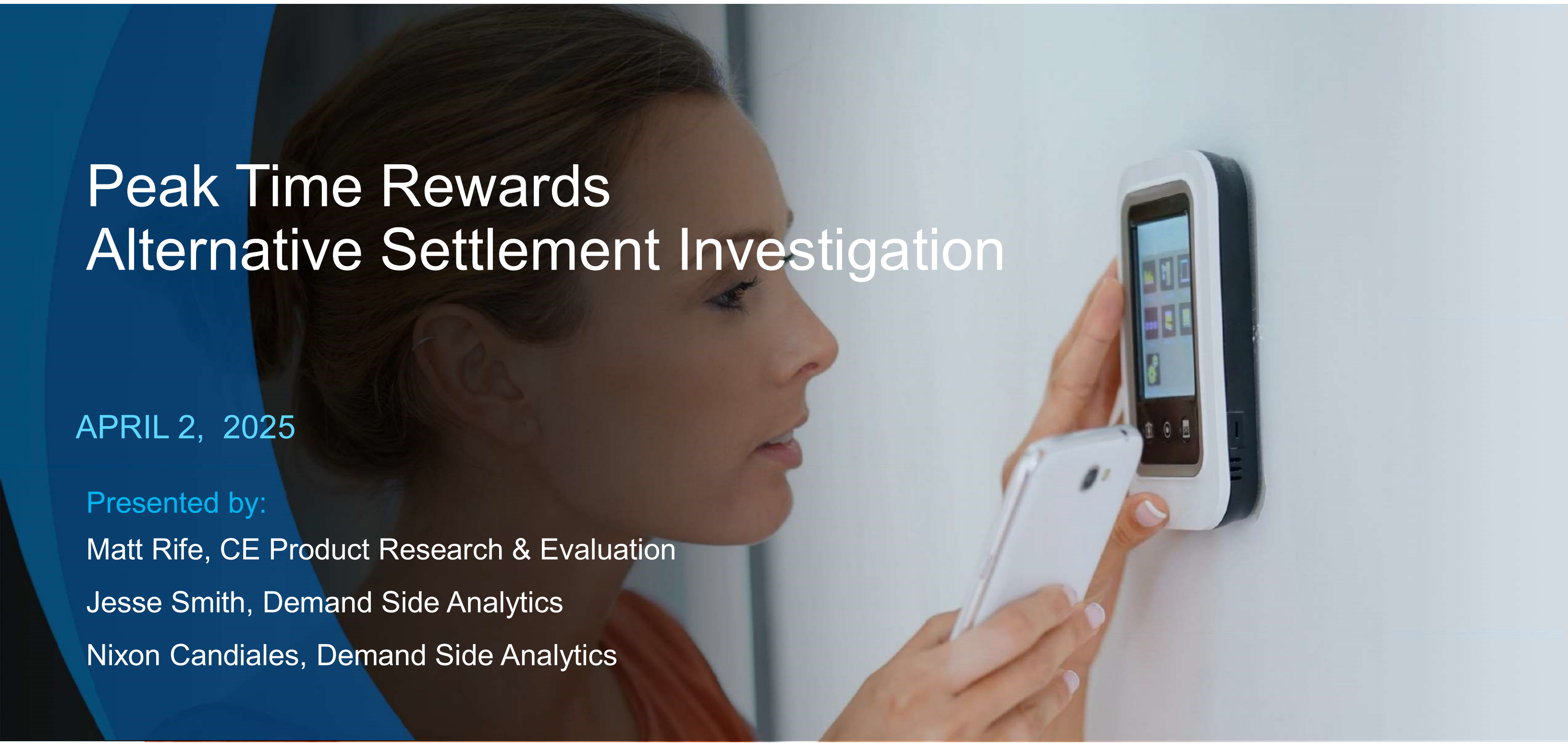


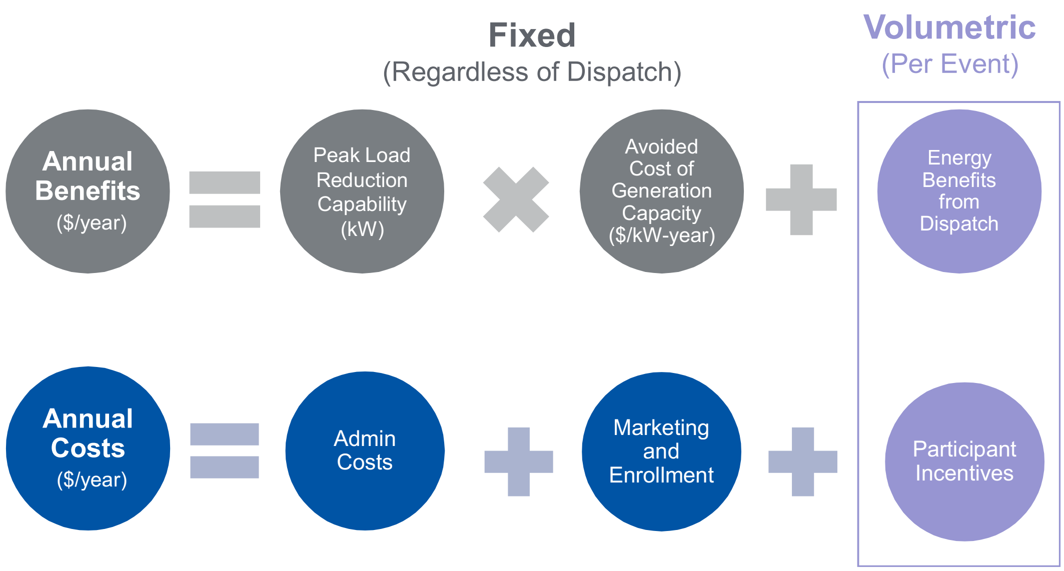
Peak Time Rewards Alternative Settlement Investigation

APRIL 2, 2025

Presented by:
Matt Rife, CE Product Research & Evaluation
Jesse Smith, Demand Side Analytics
Nixon Candiales, Demand Side Analytics

Economic Challenges with Peak Time Rewards Dispatch

The primary benefit for PTR is **capacity** – the ability to reduce demand if needed and avoid construction or purchases from the grid. This **benefit is fixed** whether you call events or not.



Economic Challenges with PTR Dispatch

The decision to dispatch PTR centers on whether **marginal benefit outweighs marginal cost** (i.e., gains from wholesale energy arbitrage > incentives paid to participants)

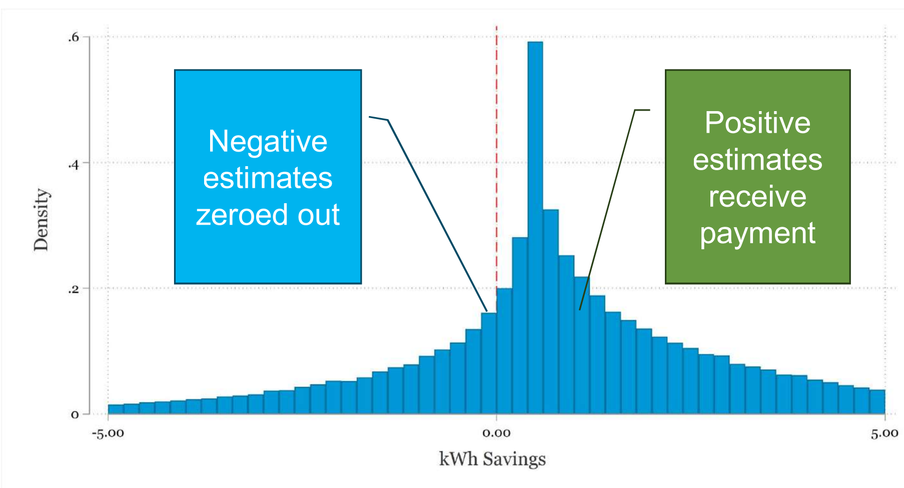
Reducing incentives could improve the cost-effectiveness of events, but **potentially at expense of diminished response** by participants

Calling a subset of participants decreases **both** marginal costs and benefits, but:

- Demonstrates that **capacity is real**
- Helps **keep your tools sharp** (i.e., customers may forget about program)

The Problem with PTR.. Payment Asymmetry

Because there are no negative bill credits, the average payment is greater than the average performance. The **real cost is far more** than $1 per kWh.



Date	Bill Credits	kWh Saved (2-6pm)	Cost per kWh
6/15/2022	$148,422	40,507	$3.66
6/21/2022	$127,611	44,398	$2.87
6/22/2022	$120,336	24,103	$4.99
7/19/2022	$100,466	44,138	$2.28
7/21/2022	$104,094	40,007	$2.60
Average	**$120,186**	**38,631**	**$3.28**

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Alternative Strategies

And associated economics

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Simulate Per-Event Bill Credit Cost by Changing the Incentive Structure

We applied the distribution of impacts and bill credits from summer 2022 events to current program enrollment levels and tested the alternative settlement approaches below.

Minimum Threshold (Raise the Floor)	• Bill credits are given only if savings exceed 1 kWh • The threshold in the example is 1 kWh
Cap on Credits (Lower the Ceiling)	• Even if a home saves saves 22 kWh, they only gets paid for 5 kWh • The “cap” in this example is 5 kWh
Round Down	• Savings are rounded down to the nearest integer. If someone saves 1.88 kWh, the credit is based on 1 kWh
Reduced Incentive Rate	• Lowering the $/kWh saved payment rate • The current program design is $1 per kWh

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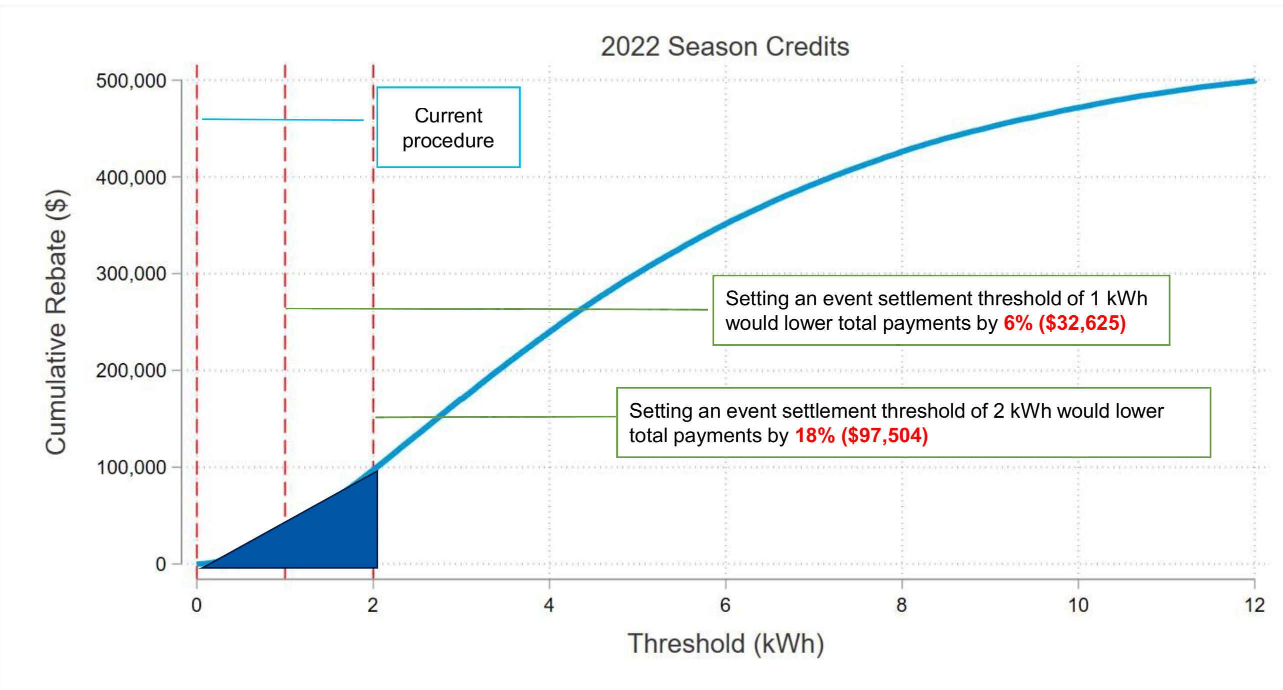
You could set the settlement threshold above 0.0 kWh (or $0.00)



Setting a higher threshold (e.g., 5 kWh) would yield significant cost savings

Setting the Settlement Threshold at 5 kWh Yields the Highest Percent Savings

Incentive	2022 Season ($1 per kWh)			2025 Season ($1 per kWh)
	Estimated Bill Credits (per event)	Share of Participants Receiving a Bill Credit	Percent Savings (per event)	Simulated Bill Credits (per event)
Current Procedure	$108,208	59%	-	$212,148
Savings Threshold at 5 kWh	$48,045	8%	56%	$94,190
Savings Threshold at 2 kWh	$88,860	26%	18%	$173,906
Savings Threshold at 1 kWh	$101,795	38%	6%	$199,009

Note: Assumes changing the settlement threshold won't affect how customers save energy.

- Implementing a minimum kWh savings threshold to receive a bill credit limits the number of credits issued and **lowers the overall cost.**
- As the threshold goes up, fewer participants qualify for bill credits

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Capping PTR Incentive is the Least Effective Strategy for Cost Savings

Incentive	2022 Season ($1 per kWh)			2025 Season ($1 per kWh)
	Estimated Bill Credits (per event)	Share of Participants Receiving a Bill Credit	Percent Savings (per event)	Simulated Bill Credits (per event)
Current Procedure	$108,208	59%	-	$212,148
Cap on Savings at 5 kWh	$90,512	59%	16%	$177,416
Cap on Savings at 20 kWh	$107,546	59%	0.6%	$210,804
Cap on Savings at 50 kWh	$108,048	59%	0.1%	$211,788

Note: Assumes capping the incentive won't affect how customers save energy.

- Imposing savings caps results in **limited cost savings**, since most credits are just a few dollars.
- **Extreme savings values are not common**. Only a 1% of customers save more than 11 kWh in any given PTR event
- Capping the incentive does little to ensure your **average payment** is close to the **average performance.** This addresses the right tail, but the left tail is the problem

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Reducing PTR Incentives Lowers Bill Credits but Doesn't Fix Payment Asymmetry

Incentive	2022 Season ($1 per kWh)			2025 Season ($1 per kWh)
	Estimated Bill Credits (per event)	Share of Participants Receiving a Bill Credit	Percent Savings (per event)	Simulated Bill Credits (per event)
Current Procedure	$108,208	59%	-	$212,148
Incentive of $0.50 per kWh	$54,104	59%	50.0%	$106,051
Incentive of $0.75 per kWh	$81,156	59%	25.0%	$159,077

Note: Assumes lowering the incentive won't affect how customers save energy.

- Lowering the incentive per kWh saved can achieve **up to 50% in cost savings**, assuming consumer behavior stays the same
- Will customers take the same amount of action for half the money?

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Rounding Down.. Helps Balance Out the Rounding That Occurs in the Participant's Favor When Savings is Negative

Incentive	2022 Season ($1 per kWh)			2025 Season ($1 per kWh)
	Estimated Bill Credits (per event)	Share of Participants Receiving a Bill Credit	Percent Savings (per event)	Simulated Bill Credits (per event)
Current Procedure	$108,208	59%	-	$212,148
Rounding Down to Nearest kWh	$89,015	39%	18%	$174,412

Note: Assumes rounding down the incentive won't affect how customers save energy.

- The current procedure "rounds" all negative kWh savings estimates to a $0 bill credit
- Rounding down the rebate to the nearest dollar amount offers good cost savings. It imposes a sort of **offsetting asymmetry in the settlement mechanics**
- You could combine the round down approach with lower per kWh incentives with an altered floor/ceiling for additional cost reductions.

Demand Side Analytics DATA DRIVEN RESEARCH AND INSIGHTS | Consumers Energy Count on Us® | CADMUS

The Settlement Baseline Could Also Be Revisited

Different baselines will return different estimates of a customer's savings which is important for the magnitude and distribution of bill credits

What is the **current procedure**? All baseline are biased – it just a question of how much and in whose favor? A baseline with an upward bias favors the participant. A baseline with a downward bias favors the Company.

Would a **different settlement baseline** make dispatch more economically viable? Assessing the accuracy and bias of the current baseline and alternative baselines is a straightforward analysis.

Randomization for Summer 2025

Once we receive the data request response, DSA will complete the randomization.

Alternating Treatment Design
We will create four equally sized groups

- If you dispatch 1 of 4 groups, the event cost will be 25% of a full PTR event
- If you dispatch 3 of 4 groups, the event costs will be 75% of a full PTR event
- Unless you give the withheld homes $3 each!?! Is that rule still in place?

Validity Checks

- We will run some upfront balance checks on customer characteristics
- We will test the load equivalence once June AMI data is available

Question:

4. Has a benefit-cost analysis been conducted for the Critical Peak Pricing program?

Response:

Yes, the Company includes a benefit-cost analysis in each of its annual Demand Response reconciliation filings.

Witness: Alex M. Gast
Date: September 9, 2025

MICHIGAN PUBLIC SERVICE COMMISSION
Consumers Energy Company
Calculation of Demand Response Levelized Costs

		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
Line No.		2015	2024	2030	2035	2040	2041	2042	2043	2044
1	Enrolled Capacity (MW)	-	655.8	698.4	702.2	702.2	701.5	701.0	700.6	700.6
2	2021 IRP Target (MW)	-	630.0	698.0	698.0	698.0	698.0	698.0	699.0	700.0
3	Revenue Requirement ($000)									
4	O&M	210.2	31,263.6	31,954.1	30,140.0	28,428.9	28,098.5	27,771.9	27,449.2	27,130.2
5	Customer Credits	37.0	10,829.1	11,363.0	12,745.4	14,025.3	14,254.0	14,493.1	14,739.9	15,004.7
6	Depreciation	7.7	4,762.9	5,124.8	3,242.8	158.5	137.8	119.9	104.2	90.6
7	Return	9.0	3,209.2	1,377.8	-	-	-	-	-	-
8	R&PP Tax	1.6	698.7	772.2	799.2	812.6	814.4	815.9	817.2	818.3
9	Total	265.5	50,763.5	50,591.9	46,927.3	43,425.3	43,304.6	43,200.8	43,110.5	43,043.8
10	**Levelized Cost ($000/MW)**	**73.066**								
	Including Financial Incentive ($000)									
11	Levelized Cost	75.5	73.1	73.1	73.1	73.1	73.1	73.1	73.1	73.1
12	75% of CONE		95.4	98.2	98.2	98.2	98.2	98.2	98.2	98.2
13	Financial Incentive		6,812.4	6,812.4	6,812.4	6,812.4	6,812.4	6,812.4	6,812.4	6,812.4
14	Total with Financial Incentive	265.5	57,575.9	57,404.3	53,739.8	50,237.7	50,117.0	50,013.2	49,922.9	49,856.2
15	**Levelized Cost with Financial Incentive ($000/MW)**	**82.255**								

MICHIGAN PUBLIC SERVICE COMMISSION
Consumers Energy Company
2024 DR Financial Incentive
Shared Savings Methodology

Line No.	Program	Levelized Cost $/MW	75% of CONE $/MW	MISO Registered MW (1)	Weighted Cost	Weighted CONE	Shared Difference
	(a)	(b)	(c)	(d)	(e) (b) x (d)	(f) (c) x (d)	(g) ((f) - (e)) x % shared
	2024 Actual						
1	Device Cycling	$ 193,671	$ 95,351	44	$ 8,521,546	$ 4,195,455	$ (2,163,045)
2	Dynamic Peak Pricing	24,491	95,351	26	641,187	2,496,296	927,554
3	Smart Thermostat Program	134,565	95,351	42	5,651,720	4,004,753	(823,484)
4	Commercial & Industrial	53,147	95,351	420	22,342,913	40,085,666	8,871,376
5	**Financial Incentive = sum of col (g), lines 1-4**						**$ 6,812,402**

MICHIGAN PUBLIC SERVICE COMMISSION

Consumers Energy Company

DR Program Levelized Costs

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Device Cycling																		
Unit Cost ($/MW)	-	341,154	101,623	177,040	150,202	155,437	176,433	196,946	218,590	233,397	193,767	202,093	203,183	216,136	229,650	243,709	258,275	273,389
Levelized Cost ($/MW)										193,671								
Dynamic Peak Pricing																		
Unit Cost ($/MW)	-	8,857,845	187,162	61,403	52,464	80,721	64,119	45,878	6,226	6,467	6,130	6,089	6,069	6,094	6,089	6,080	6,066	6,067
Levelized Cost ($/MW)										24,491								
Smart Thermostat Program																		
Unit Cost ($/MW)	-	-	-	-	1,290,222	204,825	165,490	183,389	140,013	118,218	117,620	115,307	116,965	102,422	98,147	94,202	90,542	87,163
Levelized Cost ($/MW)										134,565								
Commercial & Industrial																		
Unit Cost ($/MW)	-	-	63,522	56,118	64,549	61,395	57,276	24,967	48,798	50,385	55,298	54,442	54,471	54,173	53,620	53,556	52,756	52,976
Levelized Cost ($/MW)										53,147								
Total Program																		
Unit Cost ($/MW)	-	571,492	76,303	70,968	82,312	87,197	86,977	61,755	78,679	77,402	79,330	77,191	76,866	75,081	73,547	72,438	70,957	70,327
Levelized Cost ($/MW)										73,066								

(1) Actual inputs aligned with Revenue Requirement calculation. Forecast based on estimated calculation.
(2) 2025 and 2026 credit calculation based on reduced amount approved in U21585 rate case. Forecast for 2027 and beyond calculated using kW reduction per customer and approved credit amount
(3) 2025-2028 inputs use Long Term Financial Plan (LTFP); 2029-2044 use 2028 value escalated by LTFP CAGR
(4) Forecast developed using enrollment and approved customer credit changes
(5) Return rate and property tax rate forecast uses CAGR for 2025 and beyond
(6) Future incentive projected using LTFP CAGR for DPP expenses

2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
289,110	305,264	260,411	125,965	135,608	146,508	158,834	172,782	188,564	206,407	226,576	248,900
6,085	6,114	6,153	6,200	6,254	6,310	6,405	6,507	6,608	6,715	6,830	6,937
84,065	81,182	78,473	75,932	73,532	71,262	69,118	67,098	65,196	63,399	61,699	59,961
53,251	53,495	53,769	54,055	54,357	54,665	54,966	55,276	55,583	55,885	56,194	56,514
69,793	69,185	66,826	62,452	62,276	62,112	61,969	61,846	61,732	61,623	61,531	61,435

MICHIGAN PUBLIC SERVICE COMMISSION

Consumers Energy Company

DR Program Actual Costs and Forecast

		2020	2021	2022	2023
	O&M				
Res	ACPC	2,144,911	2,021,402	1,689,768	2,009,630
Res	DPP	923,561	636,440	415,905	192,422
Res	STP	6,247,174	5,353,231	7,642,932	6,672,869
Res	Admin	1,208,469	3,111,498	6,534,035	6,826,000
C&I	Prog., Admin.& Cust. Pay.	6,378,050	9,458,371	9,939,358	16,615,899
		16,902,166	**20,580,942**	**26,221,998**	**32,316,820**
	Capital				
Res	Net Closings/Capex	7,014,753	4,986,725	9,489,550	5,152,425
Res	Avg. Plant Balance	23,435,105	33,224,172	39,909,308	47,230,306
Res	Avg. CWIP	1,667,463	1,653,620	1,050,468	61,157
Res	Avg. Accum. Depr.	1,650,044	3,945,607	6,721,282	9,105,116
Res	Depr. Expense	960,233	2,481,445	3,375,981	3,903,670
Res	Actual Depr. Rate	4.1%	7.5%	8.5%	8.3%
C&I	Net Closings/Capex	1,344,913	2,415,375	1,527,016	(330,486)
C&I	Avg. Plant Balance	2,775,002	4,179,075	5,785,951	6,400,364
C&I	Avg. CWIP	3,771,319	836,754	243,961	7,488
C&I	Avg. Accum. Depr.	433,326	859,321	1,423,341	1,829,735
C&I	Depr. Expense	227,978	505,836	700,747	774,379
C&I	Actual Depr. Rate	8.2%	12.1%	12.1%	12.1%
	Pre-Tax Rate of Return	7.40%	7.07%	7.03%	7.06%
	Property Tax Rate	1.14%	1.19%	1.18%	1.20%
	Customer Tariff Credits				
Res	ACPC	2,442,898	2,759,536	2,850,722	2,876,495
Res	DPP	295,329	383,058	710,195	94
C&I	GSI			-	-
C&I	GI				1,240,172
C&I	EIP				5,832,124
		2,738,227	**3,142,594**	**3,560,917**	**9,948,885**
		PY 20/21	*PY 21/22*	*PY 22/23*	*PY 23/24*
	MISO CONE ($/MW-year)	94,000	94,800	93,770	105,910

			Forecast (2025-2028 LTFP for costs)			
2024	CAGR	2024 Source	2025	2026	2027	2028
2,487,899	21.3%	EAM-1, pg2	761,201	769,187	777,379	793,387
241,854	-23.7%	EAM-1, pg2	190,000	190,000	190,000	190,000
6,371,940	-8.7%	EAM-1, pg2	7,410,033	7,437,300	7,682,504	6,846,000
5,456,536	-8.6%	EAM-1, pg2	6,095,618	5,635,120	5,898,190	5,885,559
16,705,331	29.6%	EAM-1, pg2	19,095,212	18,996,848	19,011,817	18,995,004
31,263,559	9.2%		**33,552,064**	**33,028,455**	**33,559,890**	**32,709,949**
1,294,953	-34.5%	AMG-1, WP 1	706,312	722,179	738,467	743,087
50,418,619	21.1%	AMG-1, WP 1				
1,778	-81.9%	AMG-1, WP 1				
10,029,258	57.0%	AMG-1, WP 1				
4,052,426	43.3%	AMG-1, WP 1				
8.0%	18.3%	AMG-1, WP 1				
160,615	-41.2%	AMG-1, WP 1	160,000	150,000	100,000	100,000
6,266,922	22.6%	AMG-1, WP 1				
46,756	-66.6%	AMG-1, WP 1				
2,224,684	50.5%	AMG-1, WP 1				
710,429	32.9%	AMG-1, WP 1				
11.3%	8.4%	AMG-1, WP 1				
7.22%	-0.6%	AMG-1, WP 1				
1.23%	1.9%	AMG-1, WP 1				
2,994,691	2.5%	EAM-1, pg2				
21	-99.5%	EAM-1, pg2				
-		EAM-1, pg2				
2,447,528	97.4%	EAM-1, pg2				
5,386,905	-7.6%	EAM-1, pg2				
10,829,144						
PY 24/25			*PY25/26*			
$ 127,135	7.8%		130,930			

CAGR
1.4%
0.0%
-2.6%
-1.2%
-0.2%
-0.8%
-13.0%
-14.5%

Question:

5. If the answer to question 4 above is yes, please provide all information and final results associated with the conducted benefit-cost analysis associated with the Critical Peak Pricing program.

Response:

See the attached file U-21870-MEIU-CE-0381_ATT_1. Case No.: U-21906, the Company's 2024 Demand Response Reconciliation, includes the levelized cost for Dynamic Peak Pricing ("DPP") on WP7, of which the Critical Peak Pricing ("DPP") program is a component, along with Peak Time Rewards ("PTR"). On Exhibit A-6 (AMG-3), the Company compares the levelized cost of the program to 75% of Cost of New Entry ("CONE"), which is considered the primary benefit of the demand response programs.

Witness: Alex M. Gast
Date: September 9, 2025

Question:

1. Please refer to the Company's response to question 1(a) of U21870-MEIU-CE-0259. Question 1(a) of U21870-MEIU-CE-0259 requested that Consumers Energy Company "please provide all information, including information developed by Cadmus, that the Company utilized to support a proposed reduction in the demand savings amount and the credit value for both the Critical Peak Pricing ('CPP') Program and the Peak Time Rewards ('PTR') Program." In Consumers Energy Company's response to this question, the Company referred to Exhibit A-9 (JRB-3) P. 1-60 in Case No. 21410 for CPP and PTR 2022 program impact results presentation. The Company also responded stating that "in 2025, Cadmus conducted an analysis that applied the distribution of impacts and bill credits from summer 2022 events to current program enrollment levels and tested the alternative settlement approaches to help improve program cost-effectiveness." Consumers Energy Company also provided a single picture depicting a slide from a presentation showing how reducing PTR incentives lowers bill credits but doesn't fix payment asymmetry.

a. Please provide all of the information from the analysis that Cadmus conducted in 2025 that applied the distribution of impacts and bill credits from summer 2022 events to current program enrollment levels.

b. Please provide the full presentation that Cadmus provided to Consumers Energy Company which presents the analysis and the results of the analysis that Cadmus conducted in 2025.

c. In the slide depicted in Consumers Energy Company's response to question 1(a) of U21870-MEIU-CE-0259 as referenced above, there is a note stating that the information presented "assumes lowering the incentive won't affect how customers save energy." Did Consumers Energy Company or Cadmus make any calculations under the assumption that lowering the incentive may affect how customers save energy?

d. If the answer to (c) above is yes, provide all information and calculations associated with these assumptions.

e. If the answer to (c) above is no, please explain why Consumers Energy Company or Cadmus did not consider the assumption that lowering the incentive may affect how customers save energy.

Response:

a. U21870-MEIU-CE-0377_ATT_1 is the code file that Cadmus used to run the calculations for the 2022 events. U21870-MEIU-CE-0377_ATT_2 is the Excel workbook that Cadmus used to calculate the hypothetical rebate amounts by using the alternate incentives and scaling by the growth in participants (PTR enrollment had almost doubled from 2022 to the time the analysis was done).

b. See the attached file U21870-MEIU-CE-0377_ATT_3

c. No, the purpose of the Alternative Incentive Analysis was to explore different potential opportunities to improve program cost-effectiveness but did not attempt to calculate how customer behavior would change under different scenarios.

d. NA

e. The Company identified the potential risk but did not have any data to support how changing the incentive amount would affect customer behavior, if at all, and did not want to speculate or invest in hypothetical research when any actual impacts would be verified through future impact evaluations.

Witness: Alex M. Gast
Date: September 9, 2025

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

*****

In the matter of the application of **Consumers Energy Company** for authority to increase its rates for the generation and distribution of electricity and for other relief.	)))))	**Case No. U-21870**

DIRECT TESTIMONY OF JOHN D. ALBERS

ON BEHALF OF

THE MICHIGAN ENERGY INNOVATION BUSINESS COUNCIL,

INSTITUTE FOR ENERGY INNOVATION,

AND

ADVANCED ENERGY UNITED

Table of Contents

I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is John D. Albers. My business address is 1801 Pennsylvania Avenue NW, Suite 410, Washington, DC 20006.

Q. By whom are you employed and in what capacity?

A. Since October of 2023, I have been employed by Advanced Energy United, Inc. ("United") as the Director overseeing regulatory policy for the central states where United is active. This includes Illinois, Michigan, Indiana, and Wisconsin.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of the Michigan Energy Innovation Business Council ("Michigan EIBC"), the Institute for Energy Innovation, and United, collectively referred to as "MEIU."

Q. Did you prepare or direct the preparation of this testimony?

A. Yes.

Q. Please describe your background.

A. I earned a Bachelor of Arts in Political Science from Illinois State University in 1994 and Juris Doctorate from the University of Illinois College of Law in 1997. I have been admitted to practice law in the State of Illinois since 1997.

In February of 1998 I joined the Illinois Commerce Commission ("ICC") as an Administrative Law Judge and presided over nearly every type of public utility matter that came before the ICC until I left in 2015. Issues I gained experience with include, but are not limited to, rate design, cost recovery, interconnection, metering, energy procurement, renewable energy credit ("REC") procurement, and distributed generation ("DG"). Over the years, I took on increasing responsibility, including overseeing informal agency workshops, testifying on behalf of the agency in legislative hearings, and recommending agency positions on proposed legislation.

After leaving the ICC, I practiced law until early 2022, representing and advising individuals, small and large businesses, small utilities, and state and national not-for-profit organizations on various matters pertaining to renewable energy, infrastructure siting, utilities, DG, tariffs, and other issues. I frequently represented clients in matters before the ICC. During this period, I also worked part-time as a contract real estate developer for IPS Solar securing leases and permits for community solar projects in Illinois.

From March of 2022 until August of 2023, I oversaw SunPower Corporation's policy and strategy efforts in the Midwest. SunPower was a national seller of residential rooftop solar energy systems. In this role I educated state utility regulatory commissioners and legislators and advocated for policies that would improve and expand the market for residential solar installations.

In my role at United, I advocate for policies at state utility regulatory commissions that enable greater deployment of advanced energy technologies with the ultimate goal of powering our economy with clean energy. This requires understanding member interests and priorities. Recent areas of interest include siting larger distributed energy resources ("DERs"), interconnection of both large and small DERs, as well as electric vehicle ("EV") charging stations, aggregation of DERs as part of virtual power plants ("VPP"), large load tariffs, decarbonization of the natural gas distribution system, and better planning and coordination by and between electric and gas utilities. My work experience and education are set forth in detail in my resume, attached as Exhibit MEIU-3.1.

Q. Are you representing MEIU as legal counsel as well?

A. No. I am not representing MEIU as legal counsel and am not testifying as an attorney. MEIU will present its legal arguments in its briefs.

Q. Have you previously testified before the Michigan Public Service Commission ("Commission")?

A. Yes, on four occasions. I previously offered testimony in Case No. U-21585, concerning Consumers Energy Company's ("Consumers") application to increase its electric rates. My testimony addressed Consumers' proposed DER management system ("DERMS") and the need to maintain a proper inventory of equipment with long-acquisition lead times. I also offered testimony in Case No. U-21375, concerning DTE Electric Company's ("DTE") voluntary green pricing program, and specifically whether the Commission should require DTE to purchase RECs from customers with DG systems. In addition, I offered testimony in Case No. U-21859 regarding the tariff terms and conditions governing service to large load customers in Consumers' territory. Most recently, I offered testimony in a DTE electric rate case, Case No. U-21860, addressing DTE's demand response procurement efforts as well as DERMS and VPP tariff development.

Q. Have you previously testified before other state public utility commissions?

A. Yes. I offered testimony in 2022 on behalf of the Joint Solar Parties in ICC Docket No. 22-0036 regarding net metering. I also testified in 2024 on behalf of United in ICC Docket No. 22-0486 pertaining to data access, a proposed spare transformer program, and DERMS. At the Indiana Utility Regulatory Commission, I offered testimony in 2024 on behalf of United in an investigation (Cause No. 46043) concerning whether DER aggregators are public utilities under Indiana law.

Q. Are you offering any exhibits with your testimony?

A. Yes, I am offering the following exhibits:

- Exhibit MEIU-3.1: Résumé of John Albers
- Exhibit MEIU-3.2: Discovery response U21870-MEIU-CE-0394

Q. What is the purpose of your testimony?

A. The purpose of my direct testimony is to respond to the testimony of Consumers witness Michael Kelly regarding the acquisition of hardware for which there is a long wait to receive the hardware after ordering.[1]

[1] Direct Testimony of Michael Kelly on behalf of Consumers Energy Company, Case No. U-21870 ("Kelly Direct"), pp. 185–188.

II. EQUIPMENT INVENTORY

Q. What is the concern with hardware with a long acquisition lead time?

A. As Michigan, and much of the nation, experiences a growth in DER deployment, transportation electrification, and electricity demand, it is important that electric utilities have the means to accommodate such growth. This includes utilities having the necessary hardware they are responsible for providing to accomplish interconnections with the electric grid. In its prior electric rate case, Case No. U-21585, several Consumers witnesses expressed concern about the long lead time associated with obtaining transformers.[2] I noted in my testimony in that case that such long lead times for obtaining transformers was consistent with my experience as well.[3] Because of long lead times associated with obtaining critical equipment necessary for accomplishing interconnections, deployment of new DER, EV charging stations, and generation resources can be delayed. Such delays not only impede the goals of utilities and developers but can hamper Michigan's ability to meet its statutory clean energy standard of 80% between 2035 and 2039 and 100% by 2040.[4] The initial 80% standard is only 10 years away.

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[2] In discussing delays in the development of solar projects, Company witness Thomas Clark describes as a challenge longer acquisition lead time for key components, such as transformers. (Direct Testimony of Thomas P. Clark on behalf of Consumers Energy Company, Case No. U- 21585, p. 28.) Company witness Keith Kurdziel provides greater detail about the lead times for transformers, indicating that it can take two years to obtain one. (Direct Testimony of Keith M. Kurdziel on behalf of Consumers Energy Company, Case No. U- 21585, p. 49.) Company witness Jeffrey Myrom confirms this timeframe for ordering transformers. (Direct Testimony of Jeffrey A. Myron on behalf of Consumers Energy Company, Case No. U- 21585, p. 51.)

[3] Direct Testimony of John D. Albers on behalf of MEIU, Case No. U-21585 ("Albers U-21585 Direct"), p. 30.

[4] Public Act 235 of 2023.

Q. Can anything be done to address this concern?

A. Yes. To mitigate this risk, I proposed in Consumers' last rate case, Case No. U-21585, that the Commission direct Consumers to identify hardware commonly associated with interconnecting advanced energy technologies, like DERs and EV charging facilities, that has long acquisition lead times. After having done so, to the extent that Consumers does not maintain an adequate inventory of transformers and other such equipment for the timely development and installation of advanced energy technologies, I recommended that the Commission direct Consumers to develop and propose in its next general electric rate case a system for maintaining an inventory of such equipment. I pointed out that reviewing this information will help the Commission and stakeholders evaluate the merits of maintaining such an inventory.[5]

Q. How did the Commission respond to your recommendation?

A. The Commission found merit in my recommendation. In its March 21, 2025 Order in Case No. U-21585, when discussing Consumers' purchase of long lead time transformers, the Commission stated:

> That said, the Commission does, however, agree with the ALJ and MEIU about the reasonableness of having the company provide greater transparency around these purchases. The Commission thus finds it appropriate for Consumers, in its next electric rate case, to: "(1) identify equipment generally needed for DER and EV interconnections, such as transformers, that currently have a long lead time for procurement, and (2) propose a plan for maintaining an adequate inventory of that equipment to support future development." PFD, p. 64; *see also*, MEIU's initial brief, pp. 32-33.[6]

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[5] Albers U-21585 Direct, p. 31.
[6] March 21, 2025 Order in Case No. U-21585, p. 42.

Q. Did Consumers comply with the Commission's direction in this regard?

A. Possibly. Consumers witness Kelly addressed the Commission's direction to identify equipment generally needed for DER and EV interconnections that currently have a long lead time for procurement. Figure 53 in his testimony lists several categories of equipment and for each category identifies "a) whether or not the Company has a long-term demand plan forecast of likely needs; b) whether or not the Company has identified multiple suppliers to provide redundancy; and c) whether or not the Company has a long-term contract of at least three to five years' duration with at least one supplier."[7] Witness Kelly adds that by the end of the year Consumers will have long-term contracts with a supplier for each category of equipment. He asserts that "making a demand plan, securing multiple suppliers, and establishing long-term contracts" represents Consumers' three-pronged approach to its supply chain strategy.[8]

In my opinion, Figure 53 in witness Kelly's direct testimony satisfies the Commission's direction to "identify equipment generally needed for DER and EV interconnections, such as transformers, that currently have a long lead time for procurement." It is less clear whether the remainder of what witness Kelly describes satisfies the direction to "propose a plan for maintaining an adequate inventory of that equipment to support future development." It is possible that the "demand plan forecast of likely needs" that witness Kelly references satisfies the requirement for "a plan for maintaining an adequate inventory," but witness Kelly has not provided the actual plan for any of the equipment listed. Because Figure 53 simply indicates that a demand plan exists, but does not provide

[7] Kelly Direct, p. 186.
[8] *Id*, p. 187.

any such plan, I cannot say with certainty that Consumers "propose[d] a plan for maintaining an adequate inventory of that equipment to support future development." Ostensibly, contracting with suppliers of equipment could be a sufficient plan for ensuring an adequate supply, but without knowing the demand plan or forecast witness Kelly references, this is difficult to determine.

Q. Has Consumers provided any other information to ensure an adequate supply of equipment with long acquisition lead times?

A. Yes. Exhibit MEIU-3.2 consists of Consumers' response to a discovery request seeking additional information about the equipment listed in Figure 53, including any additional aspects of the plan for maintaining an adequate inventory of the equipment. The information provided identifies the inventory in stock for each category of equipment at the end of each quarter for the years 2022, 2023, and 2024. Consumers also provided the number of items used to interconnect DERs and EV charging infrastructure projects not initiated by the company each of the same three calendar years. The information includes the acquisition lead time associated with each category of equipment the last time Consumers ordered the equipment. Consumers witness Kelly provided the response and stated that Consumers does not have any additional aspects of its plan to share beyond those stated in his direct testimony.

Q. Does the additional information in Exhibit MEIU-3.2 persuade you to conclude that Consumers maintains an adequate inventory of hardware commonly used to interconnect DERs and EV charging stations?

A. While there are some discrepancies in the acquisition lead times listed,[9] based on the quantity of items Consumers reports using to accommodate new DERs and EV charging infrastructure projects over the past three calendar years, it appears that Consumers maintains a sufficient inventory of the listed equipment. This holds true even considering the overall increases in equipment used to accommodate DER and EV projects over the three-year period spanning 2022 through 2024.

Q. Do you have any remaining concerns related to Consumers' acquisition and inventory of equipment with long lead times?

A. Ideally, we would also know what the demand plan for each category of equipment entails, as I described above. Given the quantity of equipment Consumers used to facilitate DER and EV projects over the past three years and the inventory Consumers maintained over the same period, however, I am less concerned about knowing the details of the demand plans. To ensure greater certainty for developers, I recommend that the Commission require Consumers to make its inventory of equipment with long acquisition lead times available to DER and EV projects initiated by third parties on the same basis that such equipment is available to the utility for projects that it initiates.

[9] For example, on page 2 of Attachment 1 to the discovery response, Consumers lists the lead time for overhead cable ordered for DER projects on July 1, 2024, as 52 weeks, while it lists the lead time for overhead cable ordered for EV projects on the same day as 39 weeks. Another example relates to reclosers; DER reclosers ordered on June 6, 2024, reflects a lead time of 48 weeks, while EV reclosers ordered on July 16, 2024, reflect a lead time of 39 weeks. In the case of the reclosers, it is possible those are two separate orders, perhaps even from different suppliers, which could explain the different order dates and lead times. It is simply unclear since most of the other equipment orders reflect the same dates and lead times for DER and EV projects.

III. CONCLUSIONS AND RECOMMENDATIONS

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

A. I recommend that the Commission direct Consumers to make its inventory of equipment with long acquisition lead times available to DER and EV projects initiated by third parties on the same basis that such equipment is available to Consumers for projects that it initiates.

Q. Does this conclude your testimony?

A. Yes.

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

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In the matter of the application of **Consumers Energy Company** for authority to increase its rates for the generation and distribution of electricity and for other relief.	)))))	**Case No. U-21870**

EXHIBITS OF

JOHN ALBERS

ON BEHALF OF

THE MICHIGAN ENERGY INNOVATION BUSINESS COUNCIL,

INSTITUTE FOR ENERGY INNOVATION,

AND

ADVANCED ENERGY UNITED

JOHN D. ALBERS

Williamsville, Illinois
LinkedIn: johnalbersil
jalbers532@gmail.com / 217-415-6917

PROFESSIONAL EXPERIENCE

Director, Advanced Energy United, *2023-present*
Monitor and oversee regulatory efforts related to advanced energy technologies in Illinois, Michigan, Indiana, and Wisconsin on behalf of United and assist with legislative and education efforts as needed.

- Develop policy positions in furtherance of goal of a 100% clean energy economy.
- Ensure that member interests are represented in public utility commission proceedings affecting markets for renewable energy, battery storage, electric vehicles, energy efficiency, demand response, virtual power plants, and related advanced energy technologies.
- Draft legislation, testimony, and public comments and oversee preparation of same supporting goal of a 100% clean energy economy.
- Educate regulators, legislators, state agency officials, candidates, and media on the benefits of advanced energy technologies.
- Coordinate efforts among aligned organizations to support opportunities for clean energy to power our economy.
- Oversee engagement and work by outside counsel and consultants.

Policy Advocate, SunPower, Policy & Strategy, *2022-2023*
Monitor and influence legislation, rules, and regulatory proceedings impacting the residential solar and storage markets in the Midwest.

- Represent SunPower in state and national trade associations.
- Educate legislators and regulators on the benefits of solar and storage on the electric grid.
- Draft legislation, testimony, and public comments supporting solar and storage markets.
- Advise sales and products teams on opportunities and challenges from a policy perspective.

Attorney, Shay Law, Ltd. and Westervelt, Johnson, Nicoll & Keller, LLC, *2016-2022*
Advise and represent national and local renewable energy businesses and associations in their pursuit of strategies to achieve regulatory and legislative goals driving sustainable energy alternatives.

- Educate, advise, and represent clients on various matters related to energy and public utilities, including easement, contract, permitting, municipal ordinance, and utility infrastructure issues.
- Prepare witnesses and testimony in Illinois Commerce Commission tariff, rate, and certificate proceedings.
- Educate legislators and regulators through Illinois General Assembly committee testimony and one-on-one meetings.
- Draft legislation and rules to further client objectives and prepare written advocacy fact sheets, briefing papers, memoranda, media releases, and persuasive presentations.
- Consistently monitor utility filings, state legislative action, trade press, and other sources for issues of interest to or potentially impacting clients.
- Convene and collaborate with diverse groups and individuals to support clients in achieving shared goals.

Contract Real Estate Developer, IPS Solar, *2018-2019 (part-time)*
Work independently to secure sites for and support growth of community solar in Illinois.

- Research suitable sites for solar farms taking into consideration utility service area, proximity of electrical grid and available capacity, topography, and flood plain.

JOHN D. ALBERS Williamsville, Illinois
LinkedIn: johnalbersil jalbers532@gmail.com / 217-415-6917

- Negotiate lease terms and compensation with landowners.
- Educate local authorities and area residents about solar energy and community solar projects.
- Work with local government authorities to obtain necessary permits for projects.

Assistant State's Attorney, Sangamon County State's Attorney, *2018-2019 (part-time)*
Work as the only attorney in a fast-paced short-notice setting to represent the State of Illinois in mental health cases filed in Sangamon County to aid those afflicted with mental illness. Upon being informed of which cases are going to trial, review files, interview physicians, caregivers, family, and law enforcement, prepare witnesses, and prepare arguments for trial scheduled the next day.

Administrative Law Judge III, IV, and V, Illinois Commerce Commission, *1998-2015*
Manage entire trial processes and prepare written decisions related to the electric, natural gas, water, sewer, and telecommunications industries. Based on reputation for being thorough, reliable, impartial, and adept at learning and analyzing new material, advanced quickly to highest ALJ rank. Because of my deep understanding of ICC operations, was recognized within agency as a leader and entrusted with tasks outside typical ALJ duties including leading stakeholder workshops to develop alternative dispute resolution rules and training and mentoring new ALJs on policies, practices, and precedent.

- Rule on and develop policy related to cost recovery, rate design, and service terms and conditions in utility rate cases, tariff proceedings, rulemakings, and other dockets.
- Prepare written decisions summarizing, analyzing, and resolving complex contested issues involving the electric, natural gas, water, sewer, and telecommunications industries, such as the "least cost" location for utility facilities and the use of eminent domain for such.
- Review pending legislation impacting the agency, recommend revisions and agency position, and provide testimony before Illinois General Assembly committees as needed.
- Manage multiple simultaneous complex cases and projects, many with expedited schedules, such as Ameren's petition seeking approval and location of a $1.1 billion 375-mile electric transmission line impacting over 8,400 landowners with a 7½-month deadline.
- Lead multiple hearings in Illinois communities explaining the agency process and facilitating public involvement in matters pending before the agency.

EDUCATION

University of Illinois College of Law, Champaign, IL
Juris Doctor, cum laude

Illinois State University, Normal, IL
Bachelor of Arts in Political Science, summa cum laude, Spanish Minor

Question:

18. Please refer to pages 185–188 of Company witness Kelly's direct testimony regarding hardware items with long acquisition lead times.

a. For each item identified in Figure 53, please identify the inventory maintained at the end of each quarter for each of the previous three calendar years.

b. For each item identified in Figure 53, please identify the number of items used to interconnect distributed energy resources or electric vehicle charging infrastructure projects not initiated by the Company each of the past three calendar years.

c. For each item identified in Figure 53, please identify the acquisition lead time for the most recent order placed (specifying when the order was placed).

d. Please identify any additional aspects of the Company's plan for maintaining an adequate inventory of the equipment listed in Figure 53 to support future development not described in Company witness Kelly's testimony.

Response:

a. Please refer to Attachment 1, page 1, to this discovery response.

b. Please refer to Attachment 1, page 2, to this discovery response.

c. Please refer to Attachment 1, page 2, to this discovery response.

d. The Company does not have any additional aspects of its plan to share beyond those stated in my direct testimony.

Witness: Michael P. Kelly
Date: September 9, 2025

Inventory on Hand at Quarter End

		2024				2023				2022			
		Q4	Q3	Q2	Q1	Q4	Q3	Q2	Q1	Q4	Q3	Q2	Q1
DER	**Class 2 Poles**	1,083	1,047	950	764	754	590	481	679	561	464	453	484
	Class 3 Pole	2,674	2,548	1,647	1,569	1,465	1,266	871	880	654	473	635	605
	Class 4 Poles	565	458	426	390	380	616	575	434	309	308	532	567
	Overhead Cable (FT)	6,488,798	6,905,502	6,878,896	6,768,156	7,007,477	8,407,560	8,068,442	6,684,520	4,783,210	4,477,029	5,044,703	5,904,645
	Overhead Transformer	4,771	4,443	4,974	5,121	3,331	3,629	4,482	2,477	1,365	979	1,351	1,182
	Pole Top Hardware	70,539	70,158	72,888	74,081	64,067	51,938	45,395	52,239	42,204	32,747	32,448	26,451
	Recloser	199	236	239	187	205	238	233	159	120	144	199	131
	Switches	125	146	127	134	109	114	157	157	77	104	101	134
	Underground Cable (FT)	3,203,592	3,589,437	2,895,969	2,019,080	1,785,546	1,844,167	1,960,395	1,015,002	799,905	829,460	902,837	1,112,967
	Underground Hardware	17,559	12,165	14,978	12,938	13,809	13,274	9,103	10,997	8,707	8,864	9,225	7,952
EV	**Class 2 Poles**	1,083	1,047	950	764	754	590	481	679	561	464	453	484
	Class 3 Poles	2,674	2,548	1,647	1,569	1,465	1,266	871	880	654	473	635	605
	Overhead Cable (FT)	6,488,798	6,905,502	6,878,896	6,768,156	7,007,477	8,407,560	8,068,442	6,684,520	4,783,210	4,477,029	5,044,703	5,904,645
	Pole Top Hardware	70,539	70,158	72,888	74,081	64,067	51,938	45,395	52,239	42,204	32,747	32,448	26,451
	Transformer Accessories	1,250	1,248	937	988	980	1,242	842	1,407	1,619	1,966	1,753	1,575
	Underground Cable (FT)	3,203,592	3,589,437	2,895,969	2,019,080	1,785,546	1,844,167	1,960,395	1,015,002	799,905	829,460	902,837	1,112,967
	Underground Hardware	17,559	12,165	14,978	12,938	13,809	13,274	9,103	10,997	8,707	8,864	9,225	7,952
	3PHASE Transformers	152	77	71	57	48	63	63	74	53	67	79	64

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Attachment 1
Page 2 of 2

	b. Total Quanity Used per Year			c. Leadtime	
	2022	**2023**	**2024**	Date last order placed	Leadtime
DER					
Class 2 Poles		9	39	8/12/2025	2 weeks
Class 3 Pole		9	8	8/7/2025	3 weeks
Class 4 Poles			1	8/7/2025	4 weeks
Overhead Cable		1,391	33,977	7/1/2024	52 weeks
Overhead Transformer	1	20	8	7/16/2024	47 weeks
Pole Top Hardware	2	80	327	6/30/2025	7 weeks
Recloser		1	5	6/6/2024	48 weeks
Switches		3	28	4/2/2025	9 weeks
Underground Cable		26	106	7/2/2024	52 weeks
Underground Hardware			16	12/28/2024	20 weeks
EV					
3PHASE Transformers	1	1	2	4/3/2024	52 weeks
Class 2 Poles		1		8/12/2025	2 weeks
Class 3 Poles			1	8/7/2025	2 weeks
Overhead Cable		44	60	7/1/2024	39 weeks
Pole Top Hardware	13	28	37	2/14/2025	2 weeks
Recloser			3	7/16/2024	39 weeks
Underground Cable	794	282	1,903	6/7/2024	52 weeks
Underground Hardware	15	15	24	12/28/2024	20 weeks

STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

*****

In the matter of the application of Consumers Energy Company for authority to increase its rates for the generation and distribution of electricity and for other relief.	))))	**Case No. U-21870**

PROOF OF SERVICE

STATE OF MICHIGAN)
) ss.
COUNTY OF KENT)

Lydia M. Lubbers, the undersigned, being first duly sworn, deposes and says that she is a Legal Secretary at Varnum LLP and that on the Tuesday, September 30, 2025, she served a copy of the Direct Testimonies & Exhibits of Sophia Schuster, Brett Sproul and John D. Albers on Behalf of the Michigan Energy Innovation Business Council, the Institute for Energy Innovation, and Advance Energy United and this Proof of Service upon those individuals listed on the attached Service List via email at their last known addresses.

Lydia M. Lubbers

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Date: 2025.09.30 13:33:52 -04'00'

Lydia M. Lubbers

Administrative Law Judge
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