



ENVIRONMENTAL LAW & POLICY CENTER

July 26, 2024

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

RE: MPSC Case No. U-21534

In the matter of the Application of DTE ELECTRIC COMPANY for authority to increase its rates, amend its rate schedules and rules governing the distribution and supply of electric energy, and for miscellaneous accounting authority

Dear Ms. Felice:

The following is attached for paperless electronic filing:

- **Direct Testimony and Exhibits of Boratha Tan**
- **Proof of Service**

Sincerely,

Daniel Abrams
Environmental Law & Policy Center
dabrams@elpc.org
csb

c: Service List, Case No. U-21534

HQ: 35 East Wacker Drive | Suite 1600 | Chicago, IL 60601

ELPC.org | (312) 673-6500

Manny Flores, Chair | Howard A. Learner, Executive Director

Illinois | Indiana | Iowa | Michigan | Minnesota | North Dakota | Ohio | South Dakota | Wisconsin | Washington D.C.



STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the Application of **DTE**)
ELECTRIC COMPANY for authority to)
increase its rates, amend its rate schedules and) Case No. U-21534
rules governing the distribution and supply of)
electric energy, and for miscellaneous)
accounting authority.)

DIRECT TESTIMONY OF

BORATHA TAN

ON BEHALF OF

**THE ECOLOGY CENTER, THE ENVIRONMENTAL
LAW & POLICY CENTER, UNION OF CONCERNED SCIENTISTS, AND VOTE
SOLAR**

July 26, 2024

TABLE OF CONTENTS

I.	WITNESS IDENTIFICATION.....	1
II.	PURPOSE OF TESTIMONY AND SUMMARY	3
III.	REGRESSION ANALYSIS BASICS.....	3
IV.	SUMMARY OF REGRESSION ANALYSIS IN U-21297 RATE CASE.....	4
V.	MEETINGS WITH DTE AND MPSC STAFF	6
VI.	REGRESSION ANALYSIS WITH 2023 RELIABILITY DATA	7
VII.	CONCLUSION AND RECOMMENDATIONS	14

1 **I. WITNESS IDENTIFICATION**

2 **Q: PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A: My name is Boratha Tan. My business address is 1 S. Dearborn St, Chicago, IL 60603.
4 However, I work remotely from home in Detroit, MI.

5 **Q: BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

6 A: I serve as Regulatory Manager, Midwest for Vote Solar. I oversee policy development and
7 implementation related to large scale and distributed solar generation in the region. I also
8 review regulatory filings, perform technical analyses, and testify in commission
9 proceedings on issues relating to solar generation.

10 Vote Solar is an independent 501(c)3 nonprofit working to repower the U.S. with
11 clean energy by making solar power more accessible and affordable through effective
12 policy advocacy. Vote Solar seeks to promote the development of solar at every scale, from
13 distributed rooftop solar to large utility-scale plants. Vote Solar has over 90,000 members
14 nationally, including over 2,700 members in Michigan. Vote Solar is not a trade
15 organization, nor does it have corporate members.

16 **Q: ON WHOSE BEHALF ARE YOU SUBMITTING THIS DIRECT TESTIMONY?**

17 A: I appear here in my capacity as an expert witness on behalf of the Ecology Center, the
18 Environmental Law & Policy Center, the Union of Concerned Scientists, and Vote Solar.
19 I refer to these parties collectively in this case as the Clean Energy Organizations or “CEO.”

20 **Q: PLEASE SUMMARIZE YOUR QUALIFICATIONS, EXPERIENCE, AND**
21 **EDUCATION.**

22 A: I graduated from Villanova University, with a Bachelor of Science in Mechanical
23 Engineering and a minor in Peace and Justice. I worked at Ford Motor Company for six

1 years in various capacities within the Electrical Systems Engineering department of the
2 company; my work included designing, prototyping, and testing various high voltage
3 components for future electric vehicles. My team and I have a pending patent on AI-related
4 tools for electric motors. I also graduated with a Master’s in Public Policy from the
5 University of Michigan. I have experience in different engineering and analysis tools,
6 including Autodesk, MATLAB, Ansys, RStudio, and Stata. My resume is attached as Ex.
7 CEO-6.

8 **Q: HAVE YOU TESTIFIED BEFORE THE MICHIGAN PUBLIC SERVICE**
9 **COMMISSION?**

10 A: Yes. I provided direct testimony in the DTE Electric Company (the Company, or DTE)
11 2022 Integrated Resource Plan before the Michigan Public Service Commission¹ (the
12 Commission, or MPSC), as well as the DTE Electric 2023 Rate Case.² I have also provided
13 direct testimony in the Consumers Energy 2023 Electric Rate Case.³ Finally, I have
14 provided comments in various MPSC dockets with the CEO, which can be found in my
15 resume.

16 **Q: HAVE YOU TESTIFIED OR PROVIDED COMMENTS IN SIMILAR STATE**
17 **REGULATORY PROCEEDINGS?**

¹ Direct Testimony of Boratha Tan on behalf of the Clean Energy Organizations, *In the matter of the application of DTE Electric Company for approval of its Integrated Resource Plan pursuant to MCL 460.6t, and for other relief*, Michigan Public Service Commission Docket No. U-21193, March 9, 2023.

² Direct Testimony of Boratha Tan on behalf of the Clean Energy Organizations, *In the matter of the application of DTE Electric Company for approval to increase its rates, and for other relief*, Michigan Public Service Commission Docket No. U-21297, June 13, 2023.

³ Direct Testimony of Boratha Tan on behalf of the Clean Energy Organizations, *In the matter of the application of Consumers Energy Company for approval to increase its rates, and for other relief*, Michigan Public Service Commission Docket No. U-21389, August 29, 2023.

1 A: Yes. I provided direct testimony in the Commonwealth Edison Company (ComEd) Multi-
2 Year Integrated Grid Plan and the Ameren Illinois Multi-Year Integrated Grid Plan before
3 the Illinois Commerce Commission.⁴

4 **Q: ARE YOU SPONSORING ANY EXHIBITS?**

5 A: Yes; my exhibits are outlined below.

- 6 • Exhibit CEO-6: Resume of Boratha Tan
- 7 • Exhibit CEO-7: U-21534 Discovery CEODE-1.6
- 8 • Exhibit CEO-8: U-21534_RCode.txt

9 **II. PURPOSE OF TESTIMONY AND SUMMARY**

10 **Q: WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

11 A: The purpose of my testimony is to describe the benefits of regression analysis, summarize
12 my testimony and the Commission’s order in the 2023 DTE Rate Case U-21297 with
13 respect to using regression analysis on reliability data, summarize subsequent meetings
14 with DTE and Commission Staff on regression, and provide one additional regression
15 analysis on DTE’s 2023 reliability data, which is an update to the regression analysis I
16 conducted in DTE’s prior case.

17 **III. REGRESSION ANALYSIS BASICS**

18 **Q: WHAT IS REGRESSION ANALYSIS?**

19 A: Regression analysis is a statistical model/method used to examine the relationship between
20 a “dependent variable” and one or more “independent variables”. Regression analysis is

⁴ Direct Testimony of Boratha Tan on behalf of the Joint NGOs, *Order Requiring Commonwealth Edison Company to file an Initial Multi-Year Integrated Grid Plan and Initiating Proceeding to Determine Whether the Plan is Reasonable and Complies with the Public Utilities Act.*, Illinois Commerce Commission Docket No. 22-0486, May 22, 2023. *Ameren Illinois Company*... Illinois Commerce Commission Docket No. 22-0487, May 13, 2024.

1 used to understand how these independent variables can predict (or influence) the outcome
2 of the dependent variable.

3 **Q: WHAT ARE SOME BENEFITS TO REGRESSION ANALYSIS GENERALLY?**

4 A: There are many benefits to regression analysis. For example, regression helps researchers
5 and policymakers understand the relationships between variables; understanding these
6 relationships helps identify social and structural predictors that influence outcomes.
7 Regression is also governed by statistical techniques that determine the “fit” of the model.
8 In other words, a regression model would determine if certain independent variables are
9 statistically significant enough to be correlated to the dependent variable.

10 **Q: WHY IS REGRESSION ANALYSIS IMPORTANT TO UNDERSTANDING THE**
11 **GRID?**

12 A: Regression is important in this context because the analysis allows us to interpret reliability
13 metrics with external data, that would otherwise be excluded when observing said
14 reliability metrics alone. One benefit to utilizing regression analysis includes
15 understanding the relationship between the dependent variable (i.e. reliability metrics) and
16 independent variables (such as characteristics of the grid and demographic information of
17 electric customers). These relationships can be revealed based on various available data,
18 and DTE can use regression analysis to better understand how customers experience the
19 grid’s reliability.

20 **IV. SUMMARY OF REGRESSION ANALYSIS IN U-21297 RATE CASE**

21 **Q: CAN YOU SUMMARIZE YOUR TESTIMONY IN THE U-21297 DTE RATE**
22 **CASE?**

1 A: In my U-21297 testimony, I described the benefits of regression analysis, I summarized
2 the Company’s reliability analysis presented by DTE Witness Allen J. Kryscynski, and I
3 offered my own regression model that analyzes grid reliability as a function of various
4 demographic data.⁵ In summary, my regression analysis found in 2021 and 2022 that more
5 densely populated communities experienced fewer minutes of service interruption, while
6 more BIPOC and higher income communities experienced more minutes of service
7 interruptions.

8 My findings are discussed below, in “Section VI. Regression Analysis with 2023
9 Reliability Data” of this testimony.

10 **Q: WHAT WAS THE COMMISSION’S ORDER IN CASE U-21297 AS IT**
11 **PERTAINS TO REGRESSION ANALYSIS?**

12 A: In the Commission’s December 1, 2023, order for case U-21297, the Commission ordered:
13 DTE Electric Company shall also work with the Commission Staff and
14 stakeholders to develop a detailed regression analysis of customer demographics
15 and reliability for vulnerable communities to be used in the company’s distribution
16 plan case. DTE Electric Company shall also provide the data supporting the
17 regression analysis to enable interested parties to perform their own analyses.⁶

18 The Company, following this order, reached out to all interested parties surrounding
19 regression analysis, including the CEO, Detroit Area Advocacy Organizations (DAAO),
20 and the MPSC Staff. DTE then set up a meeting with the CEO to kick off discussions
21 around running and implementing regression analysis. DAAO did not participate in these
22 meetings due to their limited availability but spoke to the CEO about improving the
23 analysis to satisfy the Commission’s order.

⁵ Case No. U-21297, Direct Testimony of CEO Witness Boratha Tan (June 13, 2023).

⁶ U-21297, Commission Order December 1, 2024, on page 375.

1 V. **MEETINGS WITH DTE AND MPSC STAFF**

2 **Q: HOW MANY MEETINGS DID YOU HAVE WITH DTE?**

3 A: The CEO met with the Company three times to discuss regression analysis. The first
4 meeting was on February 23, 2024. The second meeting was held on April 16, for both
5 CEO and MPSC Staff. The third meeting was held on May 15, for both CEO and MPSC
6 Staff.

7 **Q: WHAT WAS THE PURPOSE OF THESE MEETINGS?**

8 A: These meetings brought together DTE, CEO, and MPSC Staff to review regression
9 modeling basics, discuss available or attainable data, and determine which data sets were
10 relevant to running a regression analysis.

11 Specifically, DTE, CEO, and MPSC Staff discussed the Company's data around
12 grid characteristics. These characteristics included overhead and underground lines, most
13 recent tree-trim year, most recent pole top maintenance and modernization (PTMM) year,
14 and circuit loading. These characteristics drive at the age and condition of the grid and can
15 help show the effect of system upgrades on reliability across different demographics. More
16 importantly, these characteristics are already key drivers that the Company tracks as part
17 of maintaining the distribution grid. In the most recent meeting, DTE committed to working
18 with these grid characteristics and its reliability data to run a preliminary regression model.

19 **Q: WHAT ARE YOUR THOUGHTS ON THE PROGRESS MADE SO FAR IN**
20 **THESE MEETINGS?**

21 A: I am pleased that the parties have worked together constructively and have made progress
22 towards a preliminary analysis, but there is more work yet to do. I believe that using
23 regression analysis for understanding the grid is necessary in both the distribution grid

1 plans and in rate cases. Because DTE has filed rate cases annually, these dockets allow for
2 intervenors, such as the CEO, to promptly monitor and address any progress that the
3 Company makes in terms of reliability improvements.

4 Setting up the required files and codes to run an initial regression analysis is the most
5 tedious part; once the regression is set up, it is relatively easy to update and improve the
6 regression model with new data in subsequent proceedings. After establishing a regression
7 framework, DTE must integrate the analyses and findings into its processes. The CEO look
8 forward to engaging with the Company on this important work.

9 However, I wish to express the CEO's desire to continue working with the MPSC Staff
10 and DTE in reviewing the Company's initial regression analysis. Additionally, the CEO
11 look forward to swiftly discussing regression analysis improvements with DTE and the
12 MPSC Staff before the next distribution grid plan case.

13 **VI. REGRESSION ANALYSIS WITH 2023 RELIABILITY DATA**

14 **Q: DID DTE RUN ANY REGRESSION ANALYSIS IN THIS CASE?**

15 A: No, they did not. However, this is understandable because the Company submitted its
16 application in this Rate Case on March 28, 2024, and had only met with the CEO a month
17 before that time. Additionally, DTE did not have its grid characteristics data prepared in
18 time for this rate case.⁷

19 **Q: DID YOU RUN A REGRESSION ANALYSIS FOR THIS CASE?**

20 A: Yes, I did. I improved upon my analysis from case U-21297 by replacing area median
21 income with median home price. In that case, I analyzed the Company's reliability metrics
22 (SAIDI, SAIFI, and CAIDI) against various demographic data aggregated to census tracts.

⁷ Ex. CEO-7, U-21534 Discovery CEODE-1.6.

1 These demographics included population density, percentage BIPOC population, area
2 median income, median age, and percent of population in poverty. All of the demographic
3 information is pulled from the American Community Survey’s 5-year average.

4 SAIDI stands for “System Average Interruption Duration Index”, which means the total
5 number of minutes of interruption the average customer experiences. SAIFI stands for
6 “System Average Interruption Frequency Index”, which means how often the average
7 customer experiences an interruption. Company Witness Allen J. Kryscynski also provides
8 “all-weather (AW), or major event day (MED)” and “excluding MED” indices. According
9 to the Witness, AW or MED stands for “any 24-hour period in which there is a significant
10 statistical difference in daily SAIDI”.⁸

11 **Q: CAN YOU BRIEFLY DESCRIBE WHAT YOUR REGRESSION ANALYSIS**
12 **FOUND IN CASE U-21297?**

13 A: In case U-21297, my analysis showed that more dense communities (or census tracts) saw
14 improving SAIDI (i.e. reduced minutes of service interruption). However, more heavily
15 BIPOC and higher income communities experienced worse SAIDI (more minutes of
16 service interruption). Please see Table 1 (4th regression model) below for all weather SAIDI
17 results.

⁸ Direct Testimony of Allen J. Kryscynski on behalf of DTE *In the matter of the application of DTE Electric Company for approval to increase its rates, and for other relief*, Michigan Public Service Commission Docket No. U-21534, March 28, 2024, at 18.

Table: 2021-22 AW SAIDI, Multivariate A				
<i>Dependent variable:</i>				
	AW_SAIDI			
	(1)	(2)	(3)	(4)
log(pop_density + a)	-102.839*** (13.032)	-96.384*** (12.503)		-120.487*** (13.576)
nonwhitepercent	1.777*** (0.549)		0.617 (0.598)	2.881*** (0.643)
ami		0.909 (4.610)	12.329** (5.319)	12.279** (5.250)
Constant	671.491*** (26.488)	737.765*** (36.254)	650.677*** (55.198)	547.992*** (55.695)
Observations	2,980	2,932	2,932	2,932
R ²	0.021	0.021	0.002	0.028
Adjusted R ²	0.020	0.021	0.001	0.027
Residual Std. Error	860.658 (df = 2977)	862.548 (df = 2929)	871.095 (df = 2929)	859.756 (df = 2928)
F Statistic	31.158*** (df = 2; 2977)	31.934*** (df = 2; 2929)	2.711* (df = 2; 2929)	28.112*** (df = 3; 2928)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01			

1
2
3
4
5
6
7
8
9
10
11
12

Table 1: DTE 2021-2022 AW SAIDI Regression Analysis, from case U-21297

In this current rate case, my regression analysis features SAIDI and SAIFI as the dependent variables, and population density, percentage BIPOC population, and median home price as independent variables. I removed the other variables from this analysis to simplify the model and interpretations.

With this new regression iteration, I want to explore if the listed demographic information is correlated with DTE’s 2023 reliability data.

Q: WHY ARE YOU RUNNING REGRESSION ANALYSIS IN THIS CASE?

A: There are three main reasons why I am running an updated iteration of my regression analysis:

- 1 1. As stated earlier, regression analysis is better than observing reliability averages
- 2 alone because this analysis allows for demographic data to be included for
- 3 understanding reliability differently.
- 4 2. I want to demonstrate how regression analysis can be improved with updated data
- 5 and processes.
- 6 3. Regression analysis, when iterated on itself, is a good tool to benchmark grid
- 7 reliability over time.

8 **Q: FOR THIS REGRESSION ITERATION, WHY DID YOU SELECT**
9 **POPULATION DENSITY, PERCENT BIPOC POPULATION, AND MEDIAN**
10 **HOME PRICE AS VARIABLES FOR YOUR REGRESSION MODELING?**

11 A: Both population density and median home price can be good proxies to understanding the
12 grid. In very urban (densely populated) areas, the circuit and grid topology is different from
13 more rural areas. Median home price replaces area median income because it is a better
14 proxy for wealth; area median income can be skewed for areas in/around colleges and
15 retirement facilities where students and retirees (who may or may not have wealth) live.
16 Similarly, areas with very expensive homes could hint at newer or upgraded circuits that
17 connect these homes to the grid.

18 Having these proxies is important because they substitute for the grid topology and circuit
19 data that was not available in time for this case. The model will more accurately depict the
20 relationship between grid topology and demographic data once DTE provides the data and
21 takes over running the analyses.

22 Percent BIPOC population is chosen to determine if certain customers experienced outages
23 in 2023 differently if one community has more BIPOC residents than other communities.

1 **Q: WHAT DID YOU FIND IN YOUR ANALYSIS?**

2 A: For all-weather (AW) SAIDI, when we look at a regression model with population density,
3 percent BIPOC, and median home price included, we found:

4 • Holding percent BIPOC and median home price constant, a one percent increase
5 in population density is associated with a SAIDI decrease of 148. In other words,
6 a census tract with increasing population density can experience 148 fewer minutes
7 of interruption.

8 • Holding population density and median home price constant, a one percent
9 increase in BIPOC population is associated with a SAIDI increase of 3.5. In other
10 words, a census tract with increasing BIPOC population can experience 3.5 more
11 minutes of interruption. Note: the BIPOC variable was calculated to be from 0 to
12 100%, so the variable seen in Table 1 shows 351 SAIDI minutes. This means that
13 for a census tract with 100% BIPOC population, this community experienced 351
14 additional minutes of interruption.

15 • Holding population density and percent BIPOC population constant, a \$10,000
16 increase in median home price is associated with a SAIDI increase of 15. In other
17 words, a census tract with increasing median home price sees 15 more minutes of
18 interruption. Note: the median home price variable was calculated in \$10,000
19 increments rather than single dollars.

20 Please see Table 2 for the details of the 2023 AW SAIDI regression modeling.⁹

⁹ For my complete regression results, please see and run Ex. CEO-8, U-21534_RCode.txt

Table: 2023 AW SAIDI, Multivariate				
<i>Dependent variable:</i>				
	<i>`AW SAIDI`</i>			
	(1)	(2)	(3)	(4)
log(pop_density + a)	-125.392*** (19.865)	-116.818*** (17.439)		-147.769*** (20.394)
bipoc	-76.127 (105.333)		-101.614 (103.396)	351.382*** (120.313)
Homevalue		12.269*** (1.895)	13.120*** (2.104)	14.973*** (2.107)
Constant	1,107.476*** (48.342)	800.394*** (53.702)	887.091*** (76.027)	608.638*** (84.793)
Observations	4,478	4,389	4,389	4,389
R ²	0.014	0.022	0.013	0.024
Adjusted R ²	0.013	0.022	0.012	0.024
Residual Std. Error	1,785.417 (df = 4475)	1,787.443 (df = 4386)	1,796.365 (df = 4386)	1,785.911 (df = 4385)
F Statistic	30.763*** (df = 2; 4475)	50.429*** (df = 2; 4386)	28.199*** (df = 2; 4386)	36.520*** (df = 3; 4385)
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01			

Table 2: DTE 2023 AW SAIDI Regression Analysis

One additional observation to note is that increasing median home price is correlated with increasing SAIDI (longer duration of interruption). There may be a couple of reasons that explain this:

1. The higher priced homes are located in the suburbs and other towns with low urban density and high concentration of trees overhanging electric lines;
2. Even though newer condominiums and single-family properties are more expensive and currently concentrated in downtown Detroit, there aren't enough new builds to substantially show a shift for installing new wires and poles;
3. There might be additional factors related to the home that could be correlated with reliability, such as average age of the housing stock or average square footage.

Please see below for a map of median home price in Southeast Michigan, aggregated to census tracts (Figure 1). Each of these potential explanations could be explored in subsequent and more sophisticated regression analyses.

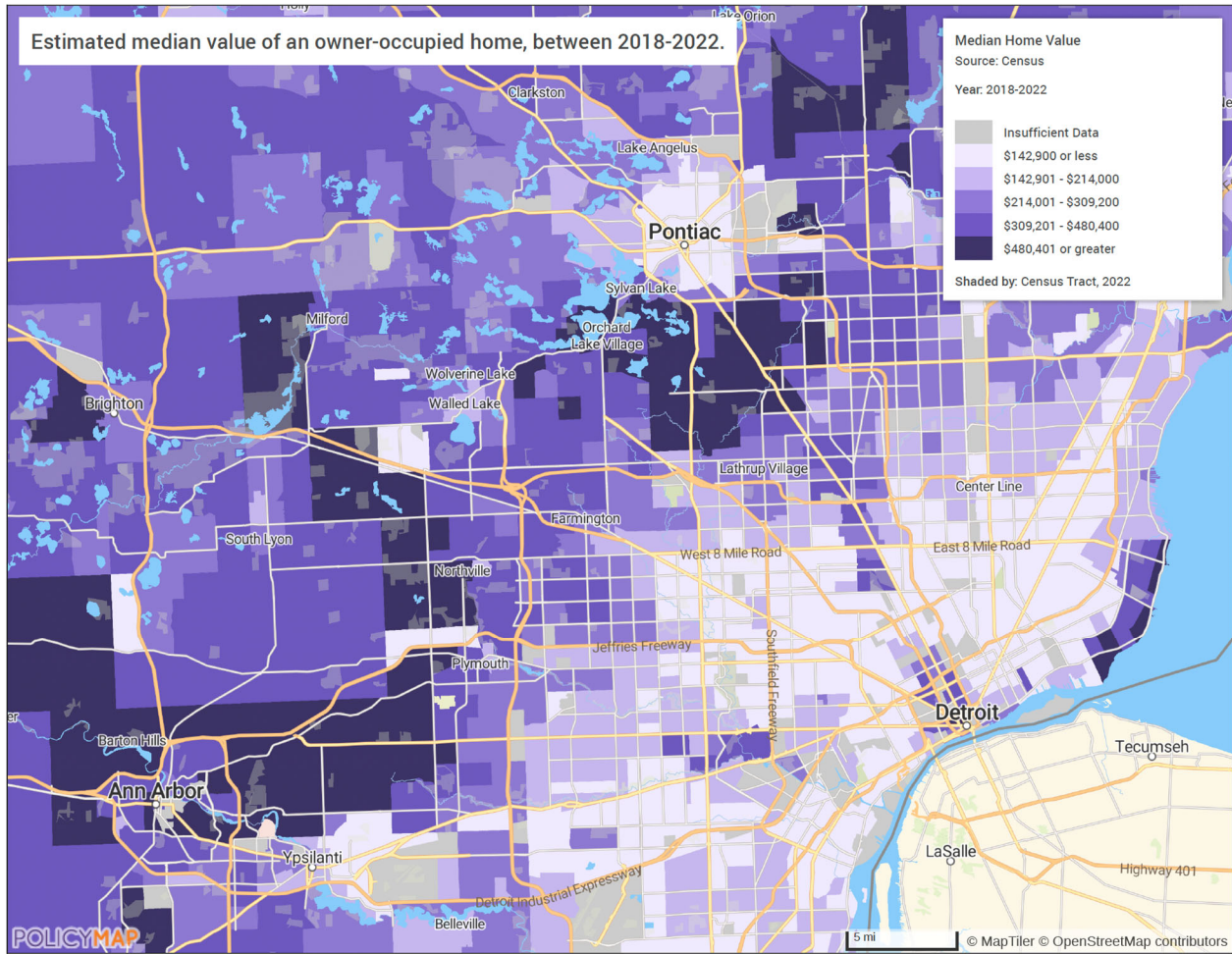


Figure 1: Median Home Value in Southeast Michigan

Q: CAN YOU COMPARE THE OBSERVATIONS YOU FOUND BETWEEN THIS REGRESSION ANALYSIS AND THE REGRESSION ANALYSIS FROM YOUR TESTIMONY U-21297?

A: Certainly. As stated earlier in my testimony, I reduced the number of independent variables for this iteration.

As seen in both regression models, more densely populated areas experience better SAIDI (fewer minutes of interruption), while more BIPOC communities experience worse SAIDI.

This intuitively makes sense because when the Company restores power in a more densely

1 populated area, it brings more customers on line at the same time, impacting SAIDI. When
2 we look at the 4th regression columns of both analyses, when we look at similarly
3 population-dense communities, BIPOC communities experience longer length
4 interruption.

5 In my first regression model, communities with higher median income experience more
6 minutes of interruption (worse SAIDI). Similarly, in this new regression model,
7 communities with higher home prices also experience more minutes of service interruption.
8 To me, this is an indication that customers did not see drastic changes to how they
9 experience the reliability of the grid between 2021 and 2023.

10 However, there is one stark difference between my first regression and this updated
11 regression: the “Constant” value. In terms of regression analysis, the Constant value is the
12 intercept when the independent variables are zero. For the purposes of analyzing SAIDI,
13 the Constant value can be simplified as the “base SAIDI” absent other variables. When
14 comparing my first analysis and the current analysis, all the “base SAIDI” in 2023 is worse
15 than the “base SAIDI” in 2021-2022. This difference hints that 2023 all-weather SAIDI, in
16 general, is worse than in the prior two years. This is corroborated by DTE Witness
17 Kryscynski’s testimony, showing a higher AW SAIDI score in 2023.¹⁰

18 **VII. CONCLUSION AND RECOMMENDATIONS**

19 **Q: WHAT ARE YOUR CONCLUSIONS AND RECOMMENDATIONS?**

20 A: While the Commission’s order in case U-21297 directed DTE to implement a regression
21 analysis for the distribution grid plan case, I find it valuable to provide new and improved

¹⁰ Direct Testimony of Allen J. Kryscynski on behalf of DTE *In the matter of the application of DTE Electric Company for approval to increase its rates, and for other relief*, Michigan Public Service Commission Docket No. U-21534, March 28, 2024, at 19.

1 iterations of my regression analysis in this rate case (and future rate cases). My regression
2 analysis does show varying degrees of experiences that customers experience, both positive
3 and negative experiences. Even though I used demographic data as proxy for grid
4 characteristics, my regression analysis demonstrates that it can be improved further with
5 grid topology data. I demonstrated that while setting up the first regression model takes the
6 most effort, updates and subsequent iterations are straightforward. By updating regression
7 with better independent variables, the model can be used to track the progress that DTE is
8 making over time. Once the Company establishes its own regression framework, it must
9 begin to integrate the analyses and findings from regression into its decision-making
10 process, as well as update and improve the regression model with subsequent data and
11 findings. The CEO look forward to participating in this process.

12 I recommend that DTE provide grid topology data as soon as possible. I also recommend
13 that the Commission also approve the use of regression analysis in rate cases and the
14 distribution grid plans, to be updated upon for each new case.

15 **Q: DOES THIS CONCLUDE YOUR TESTIMONY?**

16 **A:** Yes.

Boratha Tan

515 Rosedale Ct, Detroit, MI 48202

Work: Btan@votesolar.org

Education

University of Michigan, Gerald R. Ford School of Public Policy Ann Arbor, MI
Master of Public Policy 2023

Relevant Coursework: Cybersecurity for Future Leaders, Science and Technology Policy,
Public Management, Sustainable Energy Systems, Narrative Advocacy & Policy Change

Villanova University Villanova, PA
Bachelor of Science Mechanical Engineering 2016
Minor: Peace and Justice Education

Professional Experience

Vote Solar Detroit, MI
-Regulatory Manager, Midwest Dec 2022 to Present

- Lead modeling studies of distributed generation assumptions in utility cases
- Lead data analysis of utility reliability
- Work with non-profit stakeholders to promote cleaner, more affordable energy for low-income families
- Participate in utility rate cases, resource cases, and grid reliability cases in Michigan, Illinois, Indiana, and Minnesota
- Advance arguments for grid equity and energy justice in utility regulation

National Conference of State Legislatures Denver, CO
-Policy Analyst Intern, Environment, Energy, and Transportation May 2022 to Aug 2022

- Provide state legislators with regional energy policies
- Support research requests on energy policy
- Lead program deliverables for the Department of Energy
- Support energy program planning and logistics for state legislators

Candidate, US House of Representatives Detroit, MI
-Michigan 13th District Candidate May 2022

- Write-in campaign for the August 2022 Primary

Ford Motor Company Dearborn, MI
-Core Electric Drive Engineer, Electrified Systems Engineering Jan 2019 to Apr 2022

- Lead early prototype builds, testing of future products
 - Delivered motor results critical to program progression
- Oversee early prototype timeline
- Manage later-stage prototype testing
 - Led root-cause analysis of first in-house motor
- Lead cross-functional team lessons learned meetings

Ford College Graduate Engineer, Electrified Systems Engineering Jul 2016 to Jan 2019

- Core high voltage battery engineer, future battery packs
- Core motor engineer, motor design
- Design and release engineer, Ford Escape Hybrid and Lincoln Corsair

Golden West Humanitarian Foundation
-Research Engineer, Cambodia Field Office May 2016 to July 2016

- Lead in-field testing and troubleshooting of low-cost Explosive Ordnance Disposal Robot

Leadership and Service

Villanova University

-Board Member, Young Adult Alumni Council (YAAC) Oct 2023 to Present

University of Michigan Rackham Graduate School

-Student Government Sustainability Officer Aug 2022 to Apr 2023

- Lead sustainability programs for UofM graduate students

Villanova College of Engineering

-Board Member, Young Alumni Board Oct 2021 to Present

- Provide recommendations on the College's mission
- Promote DEI initiatives within the College

Detroit Design Core (DDC)

-DDC Design Challenge Advisor Mar 2021 to Mar 2022

- Facilitate design thinking sessions with non-profits
- Provide technical input on non-profit projects

Villanova Alumni Association

-Vice President, Club of Michigan Feb 2021 to Present

- Support planning for professional development and social events for local alumni
- Lead new programs to engage regional alumni

Freedom House Detroit

-Fundraising Committee Jan 2021 to Oct 2021

- Lead production crew for hybrid programming

Community Action Network (CAN)

-Advisor Feb 2020 to June 2020

- Provide input for STEM activities, which were implemented in summer programs

Contemplative Leaders in Action (CLA)

-Detroit Cohort Aug 2018 to Apr 2020

- Incorporate Ignatian contemplation into leadership
- Create a design of an early childhood reading program for local parish

Ss. Peter and Paul Jesuit Church

-Parish Council and Social Justice Committee Feb 2017 to May 2023

- Lead town halls for community input
- Support strategic plan development
- Lead DEI events for parish
- Participate in ecumenical meetings to address city's inequality

Thirty Under 30

-Ford Cohort Jan 2017 to Dec 2017

- Incorporate human-centered design into non-profit outreach

FIRST Robotics

-Mentor, Hamtramck High School Jan 2017 to Mar 2021

- Mentor high school students in robotics program

Skills

Additional Language: Khmer (native speaking)

Software & Apps: R (RStudio), Stata, Arduino, MATLAB, SOLIDWORKS, Autodesk,

Microsoft Office, Westlaw, State Net (LexisNexis), Python

Certificates: NMSU Center for Public Utilities "The Basics"

Awards

Non-destructive E-Motor Analysis – US Patent Office (Pending)
Rev. Ray Jackson Community Service Award – Villanova University
Illuminating Innovation and Excellence Award – Ford Motor Company

2022
2021
2021

Op-Eds

“Advancing energy justice: A new paradigm in grid equity and reliability analysis.” *Utility Dive*, 26 Feb. 2024, <https://www.utilitydive.com/news/advancing-energy-justice-grid-equity-reliability-regression-analysis/707350/>.

“Tan and Shah: Development of clean energy stifled by utilities.” *The Detroit News*, 17 Oct. 2023, <https://www.detroitnews.com/story/opinion/2023/10/17/tan-and-shah-development-of-clean-energy-stifled-by-utilities/71215180007/>.

“Environmental Justice and Grid Equity is Necessary for Michigan’s Energy System.” *Vote Solar*, 28 Feb. 2023, <https://votesolar.org/environmental-justice-and-grid-equity-is-necessary-for-michigans-grid/>.

“States Move to Protect Energy Infrastructure.” *National Conference of State Legislatures*, 9 Nov. 2022, <https://www.ncsl.org/state-legislatures-news/details/states-move-to-protect-energy-infrastructure>.

“Facing Extreme Weather, States Explore Ways to Improve Energy Resilience.” *National Conference of State Legislatures*, 12 Oct. 2022, <https://www.ncsl.org/state-legislatures-news/details/facing-extreme-weather-states-explore-ways-to-improve-energy-resilience>.

Regulatory Cases

Michigan

- U-20147, comments (*Distribution Grid Plans*)
- U-20890, comments (*Distributed Generation Case*)
- U-21193 (*DTE IRP 2022*)
- U-21297 (*DTE Rate Case 2023*)
- U-21374 (*Consumers Volunteer Green Pricing 2023*)
- U-21389 (*Consumers Rate Case 2023*)
- U-21400 (*Utility Financial Incentives and Disincentives*)
- U-21461 (*I&M Rate Case 2023*)
- U-21480, comments (*Consumers Interconnection Procedures*)
- U-21482, comments (*DTE Interconnection Procedures*)

Illinois

- 22-0486 (*INITIAL and REFILED ComEd MYIGP/RP 2022/23*)
- 22-0487 (*REFILED AIC MYIGP/RP 2022/23*)
- 23-0714 (*IPA Long-Term Renewable Resource Procurement Plan*)

Indiana

- AES Indiana IRP – 2022
- CenterPoint Energy Indiana South – 2023

Minnesota

- 24-0067 (*Xcel Integrated Resource Plan 2024*)

MPSC Case No: U-21534

Requester: CEO

Question No.: CEODE-1.6a

Respondent: J. Kryscynski

Page: 1 of 1

Question: 6. Please see the testimony of Company Witness Kryscynski at AJK-16, Table 5. Please provide the following information aggregated to census tracts:
a. Circuit voltage level

Answer: The Company objects to this request because it is vague, ambiguous and incapable of answer in its current form as table 5 contains asset age and the table is not connected to circuit voltage level. Without waiving this objection, but subject to it, the Company responds as follows:

The Company has not performed analysis that maps all customers to census tracts and circuit voltage.

Attachment: None

MPSC Case No: U-21534

Requester: CEO

Question No.: CEODE-1.6b

Respondent: J. Kryscynski

Page: 1 of 1

Question: 6. Please see the testimony of Company Witness Kryscynski at AJK-16, Table 5. Please provide the following information aggregated to census tracts:
b. Miles of overhead and underground lines

Answer: The Company objects to this request because it is vague, ambiguous and incapable of answer in its current form as table 5 contains asset age and the table is not connected to miles of overhead and underground lines. Without waiving this objection, but subject to it, the Company responds as follows:

The Company tracks its distribution lines by circuit and not by census tract. The Company has not performed the analysis needed to separate miles of overhead and underground lines by census tract.

Attachment: None

MPSC Case No: U-21534

Requester: CEO

Question No.: CEODE-1.6c

Respondent: J. Kryscynski

Page: 1 of 1

Question: 6. Please see the testimony of Company Witness Kryscynski at AJK-16, Table 5. Please provide the following information aggregated to census tracts:
c. Last tree trim year

Answer: The Company objects to this request because it is vague, ambiguous and incapable of answer in its current form as table 5 contains asset age and the table is not connected to tree trim. Without waiving this objection, but subject to it, the Company responds as follows:

The Company has not performed analysis that maps census tracts and tree trim.

Attachment: None

MPSC Case No: U-21534

Requester: CEO

Question No.: CEODE-1.6d

Respondent: J. Kryscynski

Page: 1 of 1

Question: 6. Please see the testimony of Company Witness Kryscynski at AJK-16, Table 5. Please provide the following information aggregated to census tracts:
d. Last PTMM year

Answer: The Company objects to this request because it is vague, ambiguous and incapable of answer in its current form as table 5 contains asset age and the table is not connected to PTMM. Without waiving this objection, but subject to it, the Company responds as follows:

The Company has not performed analysis that maps census tracts and PTMM.

Attachment: None

MPSC Case No: U-21534

Requester: CEO

Question No.: CEODE-1.6e

Respondent: J. Kryscynski

Page: 1 of 1

Question: 6. Please see the testimony of Company Witness Kryscynski at AJK-16, Table 5. Please provide the following information aggregated to census tracts:
e. Circuit loading

Answer: The Company objects to this request because it is vague, ambiguous and incapable of answer in its current form as table 5 contains asset age and the table is not connected to circuit loading. Without waiving this objection, but subject to it, the Company responds as follows:

The Company has not performed analysis that maps census tracts and circuit loading.

Attachment: None

Co-respondent: Legal

```
# Boratha Tan, Vote Solar
# July 26, 2024
# DTE Rate Case U-21534
# Demographic information pulled from the ACS (American Community Survey): BIPOC, population density, median
home price
# We will run just 2023 Data to show an improvement of CEO's regression analysis
```

```
# https://api.census.gov/data.html
```

```
# Steps to regression models:
# A. Extract Census Tract info
# B. Combine these three tables, into a single table
# C. Merge new table with utility spreadsheet
# D. Delete Census Tracts that are not in the utility's territory
# E. Repeat steps A-D for other relevant years
```

```
#####
```

```
# Packages
```

```
# Use this to clear the global environment
rm(list=ls())
```

```
# Use this to set the working directory. I will use my dropbox folder.
setwd("/Users/borathatan/Vote Solar Dropbox/Boratha Tan/Boratha/MI/DTE/2024/U-21534 Rate Case/Tan
Testimony/Workpapers")
```

```
# Install all the libraries; you do this only once
install.packages(c("tidycensus", "tidyverse", "geofacet", "ggridges"))
install.packages("tigris")
install.packages("viridis")
install.packages("readxl")
install.packages("writexl")
install.packages("ggplot2")
install.packages("spatialreg")
install.packages("spdep")
install.packages("sf")
install.packages("terra")
install.packages("stargazer")
```

```
# Load LIBRARIES
library(tidycensus)
library(tidyverse)
library(tigris)
options(tigris_use_cache = TRUE)
library(viridis)
library(readxl)
library(writexl)
library(ggplot2)
library(sf)
library(spatialreg)
library(spdep)
library(terra)
library(stargazer)
```

```
census_api_key("5e3ed46bfa93083d3f07ca6e36e3b0a8d8e826d8", install = TRUE)
```

```
#####
```

```
# Import Consumers data
```

```
DTE_Reliability <- read_excel("U-21534 CEO Tan Workpaper 1-DTE AJK EJ Reliability.xlsx")  
#colnames(DTE_Reliability)[1] = "GEOID" # use if census tract column is not named as GEOID
```

```
#####
```

```
# Census importing data
```

```
# Census: getting median home value for census tracts in the state
```

```
mi_housevalue <- get_acs(geography = "tract",  
  variables = "B25077_001E",  
  state = "MI",  
  survey = "acs5",  
  geometry = TRUE, year = 2022)
```

```
mi_housevalue <- mi_housevalue %>%
```

```
  mutate(mi_housevalue = estimate / 10000) # we are dividing the homevalue by $10,000 so that we can interpret it as  
"every $10,000 increase in median household..."
```

```
# Pull census tract data population from tidycensus
```

```
mi_pop <- get_acs(geography = "tract",  
  variables = c("B01003_001E"),  
  state = "MI",  
  survey = "acs5",  
  geometry = TRUE,  
  keep_geo_vars = TRUE,  
  year = 2022)
```

```
mi_pop <- mi_pop %>%
```

```
  mutate(pop_density = 1000000 * (estimate / ALAND) / 1000) # divide by 1000 makes it interpret "1000 additional  
persons per sq mile..."
```

```
# Race
```

```
mi_pop_race <- get_acs(geography = "tract",  
  variables = c("B02001_001"),  
  state = "MI",  
  survey = "acs5",  
  geometry = TRUE,  
  keep_geo_vars = TRUE,  
  year = 2022)
```

```
mi_white <- get_acs(geography = "tract",  
  variables = c("B03002_003"),  
  state = "MI",  
  survey = "acs5",  
  geometry = TRUE,  
  keep_geo_vars = TRUE,  
  year = 2022)
```

```
mi_pop_race <- mi_pop_race %>%  
  mutate(white = mi_white$estimate,
```

bipoc = (mi_pop_race\$estimate-mi_white\$estimate)/mi_pop_race\$estimate)
the bipoc column is automatically converted to 0-100% BIPOC

#####

```
#Export to excel, then re-read so that I don't have to deal with spatial dataframes
write_xlsx(mi_housevalue,"/Users/borathatan/Vote Solar Dropbox/Boratha Tan/Boratha/MI/DTE/2024/U-21534 Rate
Case/Tan Testimony/Workpapers/mi_housevalue.xlsx")
mi_housevalue_ready <- read_excel("mi_housevalue.xlsx")
write_xlsx(mi_pop,"/Users/borathatan/Vote Solar Dropbox/Boratha Tan/Boratha/MI/DTE/2024/U-21534 Rate
Case/Tan Testimony/Workpapers/mi_pop.xlsx")
mi_pop_ready <- read_excel("mi_pop.xlsx")
write_xlsx(mi_pop_race,"/Users/borathatan/Vote Solar Dropbox/Boratha Tan/Boratha/MI/DTE/2024/U-21534 Rate
Case/Tan Testimony/Workpapers/mi_pop_race.xlsx")
mi_pop_race_ready <- read_excel("mi_pop_race.xlsx")
```

```
# Merging tables, two tables at a time
mi_temp_a <- merge(DTE_Reliability, mi_pop_ready, by = "GEOID")
mi_temp_b <- merge(mi_temp_a, mi_pop_race_ready, by = "GEOID")
DTE_Combined <- merge(mi_temp_b, mi_housevalue_ready, by = "GEOID")
```

```
#colnames(DTE_final)[44] = "coordinates"
```

```
# Remove duplicated columns to make the dataframe better looking
Tan_Workpaper_CEO_Combined <- DTE_Combined[,!names(DTE_Combined) %in% c("STATEFP.x",
"COUNTYFP.x", "TRACTCE.x", "AFFGEOID.x", "NAME.x.x", "NAMELSAD.x",
"STUSPS.x", "NAMELSADCO.x", "STATE_NAME.x", "LSAD.x",
"ALAND.x", "AWATER.x", "NAME.y.x",
"variable.x", "estimate.x", "moe.x", "geometry.x",
"NAME.x", "variable.y", "estimate.y", "moe.y", "geometry.y",
"STATEFP.y", "COUNTYFP.y", "TRACTCE.y", "AFFGEOID.y",
"NAME.x.y", "NAMELSAD.y", "STUSPS.y",
"NAMELSADCO.y", "STATE_NAME.y", "LSAD.y", "ALAND.y",
"AWATER.y", "NAME.y.y", "variable.x",
"estimate.x", "moe.x", "geometry.x", "NAME.y", "variable.y",
"estimate.y", "moe.y",
"NAME", "variable", "moe", "geometry", "estimate")]
```

```
colnames(Tan_Workpaper_CEO_Combined)[15] = "Homevalue"
```

```
# Export Dataframe
write_xlsx(Tan_Workpaper_CEO_Combined,"/Users/borathatan/Vote Solar Dropbox/Boratha
Tan/Boratha/MI/DTE/2024/U-21534 Rate Case/Tan Testimony/Workpapers/Tan_Workpaper_CEO_Combined.xlsx")
```

#####

```
# Simple linear regressions, SAIFI, SAIDI with MED
SAIFIVsPopDensity <- lm(`AW SAIFI`~pop_density, data = Tan_Workpaper_CEO_Combined)
summary(SAIFIVsPopDensity)
```

```
SAIFIVsHomevalue <- lm(`AW SAIFI`~Homevalue, data = Tan_Workpaper_CEO_Combined)
summary(SAIFIVsHomevalue)
```

```
SAIFivsBIPOC <- lm(`AW SAIFI`~bipoc, data = Tan_Workpaper_CEO_Combined)
summary(SAIFivsBIPOC)
```

```
SAIDivsPopDensity <- lm(`AW SAIDI`~pop_density, data = Tan_Workpaper_CEO_Combined)
summary(SAIDivsPopDensity)
```

```
SAIDivsHomevalue <- lm(`AW SAIDI`~Homevalue, data = Tan_Workpaper_CEO_Combined)
summary(SAIDivsHomevalue)
```

```
SAIDivsBIPOC <- lm(`AW SAIDI`~bipoc, data = Tan_Workpaper_CEO_Combined)
summary(SAIDivsBIPOC)
```

```
#SAIFI vs Population Density
```

```
plot(Tan_Workpaper_CEO_Combined$pop_density,Tan_Workpaper_CEO_Combined$`AW SAIFI`,
     main='AW SAIFI vs Population Density',
     xlab='Population Density (per 1000)',
     ylab='AW SAIFI')
abline(SAIFivsPopDensity, col='red')
```

```
#SAIFI vs Homevalue
```

```
plot(Tan_Workpaper_CEO_Combined$Homevalue,Tan_Workpaper_CEO_Combined$`AW SAIFI`,
     main='AW SAIFI vs Home Value',
     xlab='Home Value ($10,000)',
     ylab='AW SAIFI')
abline(SAIFivsHomevalue, col='red')
```

```
# SAIFI vs Race
```

```
plot(Tan_Workpaper_CEO_Combined$bipoc,Tan_Workpaper_CEO_Combined$`AW SAIFI`,
     main='AW SAIFI vs Race, BIPOC',
     xlab='% BIPOC',
     ylab='AW SAIFI')
abline(SAIFivsBIPOC, col='red')
```

```
#SAIDI vs Population Density
```

```
plot(Tan_Workpaper_CEO_Combined$pop_density,Tan_Workpaper_CEO_Combined$`AW SAIDI`,
     main='AW SAIDI vs Population Density',
     xlab='Population Density (per 1000)',
     ylab='AW SAIDI')
abline(SAIDivsPopDensity, col='red')
```

```
#SAIDI vs Home value
```

```
plot(Tan_Workpaper_CEO_Combined$Homevalue,Tan_Workpaper_CEO_Combined$`AW SAIDI`,
     main='AW SAIDI vs Home Value',
     xlab='Home Price ($10,000)',
     ylab='AW SAIDI')
abline(SAIDivsHomevalue, col='red')
```

```
# SAIDI vs Race
```

```
plot(Tan_Workpaper_CEO_Combined$bipoc,Tan_Workpaper_CEO_Combined$`AW SAIDI`,
     main='System AW SAIDI vs Race, BIPOC',
     xlab='% BIPOC',
     ylab='AW SAIDI')
```

```
abline(SAIDivsBIPOC, col='red')
```

```
# The graphs show that Population Density have skewed reliability data. Logarithmic transforms for this is helpful to  
help make the predictors more linear  
# Below is creating the log transforms of the bivariate regressions
```

```
#constant to make 0's in our values doable in log-regressions  
a <- 0.00000001
```

```
SAIFivslogPopDensity <- lm(`AW SAIFI`~log(pop_density+a), data = Tan_Workpaper_CEO_Combined)  
summary(SAIFivslogPopDensity)
```

```
SAIDivslogPopDensity <- lm(`AW SAIDI`~log(pop_density+a), data = Tan_Workpaper_CEO_Combined)  
summary(SAIDivslogPopDensity)
```

```
# Multiple regression for SAIFI, SAIDI, CAIDI
```

```
# PR = Population Density, Race  
SAIFivsPR <- lm(`AW SAIFI`~log(pop_density+a)+bipoc, data = Tan_Workpaper_CEO_Combined)  
SAIDivsPR <- lm(`AW SAIDI`~log(pop_density+a)+bipoc, data = Tan_Workpaper_CEO_Combined)
```

```
# PH = Population Density, Homevalue  
SAIFivsPH <- lm(`AW SAIFI`~log(pop_density+a)+Homevalue, data = Tan_Workpaper_CEO_Combined)  
SAIDivsPH <- lm(`AW SAIDI`~log(pop_density+a)+Homevalue, data = Tan_Workpaper_CEO_Combined)
```

```
# RH = Race, Homevalue  
SAIFivsHR <- lm(`AW SAIFI`~Homevalue+bipoc, data = Tan_Workpaper_CEO_Combined)  
SAIDivsHR <- lm(`AW SAIDI`~Homevalue+bipoc, data = Tan_Workpaper_CEO_Combined)
```

```
# PRH = Population Density, Race, Homevalue  
SAIFivsPRH <- lm(`AW SAIFI`~log(pop_density+a)+bipoc+Homevalue, data = Tan_Workpaper_CEO_Combined)  
SAIDivsPRH <- lm(`AW SAIDI`~log(pop_density+a)+bipoc+Homevalue, data = Tan_Workpaper_CEO_Combined)
```

```
#####
```

```
#sink()
```

```
stargazer(SAIDivslogPopDensity,SAIDivsHomevalue,SAIDivsBIPOC, align = TRUE, type = "html", title = "Table:  
2023 AW SAIDI, Bivariate", out = "SAIDI Bivariate.html")
```

```
stargazer(SAIFivslogPopDensity,SAIFivsHomevalue,SAIFivsBIPOC, align = TRUE, type = "html", title = "Table:  
2023 AW SAIFI, Bivariate", out = "SAIFI Bivariate.html")
```

```
stargazer(SAIDivsPR,SAIDivsPH,SAIDivsHR,SAIDivsPRH, align = TRUE, type = "html", title = "Table: 2023 AW  
SAIDI, Multivariate", out = "SAIDI Multivariate.html")
```

```
stargazer(SAIFivsPR,SAIFivsPH,SAIFivsHR,SAIFivsPRH, align = TRUE, type = "html", title = "Table: 2023 AW  
SAIFI, Multivariate", out = "SAIFI Multivariate.html")
```

**STATE OF MICHIGAN
MICHIGAN PUBLIC SERVICE COMMISSION**

In the matter of the Application of DTE)	
ELECTRIC COMPANY for authority to)	
increase its rates, amend its rate schedules)	Docket No. U-21534
and rules governing the distribution and)	
supply of electric energy, and for)	
miscellaneous accounting authority)	

PROOF OF SERVICE

I hereby certify that a true copy of the foregoing *Direct Testimony and Exhibits of Boratha Tan* was served by electronic mail upon the following Parties of Record, this Friday, July 26, 2024.

ABATE

Michael J. Pattwell
Clark Hill PLC
212 E. Cesar E. Chavez Avenue
Lansing, MI 48906
mpattwell@clarkhill.com

Stephen A. Campbell
Clark Hill PLC
500 Woodward Avenue, Suite 3500
Detroit, MI 48226
scampbell@clarkhill.com

ABATE Consultant

Brian C. Andrews
James R. Dauphinais
Christopher C. Walters
Jessica York
bandrews@consultbai.com
jdauphinais@consultbai.com
cwalters@consultbai.com
jyork@consultbai.com

ADVANCED ENERGY UNITED; ENERGY MICHIGAN, INC.; FOUNDRY ASSOCIATION OF MICHIGAN; INSTITUTE FOR ENERGY INNOVATION; MICHIGAN ENERGY INNOVATION BUSINESS COUNCIL

Laura A. Chappelle
Timothy J. Lundgren
Justin K. Ooms
Potomac Law Group PLLC
120 N. Washington Square, Suite 300
Lansing, MI 48933
lchappelle@potomaclaw.com
tlundgren@potomaclaw.com
jooms@potomaclaw.com

Justin Barnes
Alexander J. Zakem
jbarnes@eq-research.com
ajz-consulting@comcast.net

MICHIGAN EIBC/IEI/UNITED

Laura Sherman
laura@mieibc.org

**CITIZENS UTILITY BOARD OF
MICHIGAN; MICHIGAN
ENVIRONMENTAL COUNCIL;
NATURAL RESOURCES DEFENSE
COUNCIL; SIERRA CLUB**

Christopher M. Bzdok
Tracy Jane Andrews
Troposphere Legal
420 East Front Street
Traverse City, MI 49686
chris@tropospherelegal.com
tjandrews@tropospherelegal.com

Breanna Thomas, Legal Assistant
breanna@tropospherelegal.com

Consultants:

Josh Denzler
Julielyn Gibbons
David Gard
Douglas Jester
Matt Bandyk
Paul Alvarez
Dennis Stephens
jdenzler@5lakesenergy.com
jgibbons@5lakesenergy.com
dgard@5lakesenergy.com
djester@5lakesenergy.com
mbandyk@5lakesenergy.com
palvarez@wiredgroup.net
dennis.stephens@hotmail.com

CITY OF ANN ARBOR

Valerie J.M. Brader
Rivenoak Law Group P.C.
3331 W. Big Beaver Rd., Suite 109
Troy, MI 48084
valerie@rivenoaklaw.com
ecf@rivenoaklaw.com

Valerie Jackson
Assistant City Attorney
City of Ann Arbor
Guy C. Larcom City Hall
301. E. Huron Street
Ann Arbor, MI 48104
Vjackson@a2gov.org

City of Ann Arbor Consultant:

Richard J. Bunch
rick@mi-maui.org

ELECTRIFY AMERICA, LLC

Jennifer Morante
Gordon Rees Scully Mansukhani
37000 Woodward Avenue, Suite 225
Bloomfield Hills, MI 48304
jmorante@grsm.com

Stephen Bright
Electrify America, LLC
1950 Opportunity Way, Suite 1500
Reston, Virginia 20190
Steve.Bright@electrifyamerica.com

Rhiannon Davis
Jigar Shah
Rhiannon.Davis@electrifyamerica.com
Jigar.Shah@electrifyamerica.com

ENVIRONMENTAL LAW AND POLICY CENTER; ECOLOGY CENTER; UNION OF CONCERNED SCIENTISTS; VOTE SOLAR

Daniel Abrams
Nicholas Wallace
James Gignac
Will Kenworthy
Brad Klein
Lee Shaver
Boratha Tan
Curt Volkman
Environmental Law & Policy Center
35 E. Wacker Drive, Suite 1600
Chicago, IL 60601
dabrams@elpc.org
nwallace@elpc.org
jgignac@ucsusa.org
will@votesolar.org
bklein@elpc.org
lshaver@ucsusa.org
btan@votesolar.org
curt@newenergy-advisors.com

Sydney White, Legal Intern
Carolyn Boyce, ELPC Paralegal
Alondra Estrada, ELPC Legal Assistant
swhite@elpc.org
cboyce@elpc.org
aestrada@elpc.org
MPSCDocket@elpc.org

EVGO SERVICES, LLC

Nikhil Vijaykar
Keyes & Fox LLP
580 California Street, 12th Floor
San Francisco, CA 94104
nvijaykar@keyesfox.com

Michael G. Oliva
Foster Swift Collins & Smith, PC
313 S. Washington Square
Lansing, MI 48933-2193
moliva@fosterswift.com

Alicia Zaloga, Paralegal
Lindsey Stegall
azaloga@keyesfox.com
Lindsey.Stegall@evgo.com

GREAT LAKES RENEWABLE ENERGY ASSOCIATION INC.

Don L. Keskey
Brian W. Coyer
University Office Place
333 Albert Avenue, Suite 425
East Lansing, MI 48823
donkeskey@publiclawresourcecenter.com
bwcoyer@publiclawresourcecenter.com

John Freeman
Bridget Corwin
John Richter
jfreeman13@comcast.net
bcorwin@umich.edu
johnarichter@pm.me

INTERNATIONAL TRANSMISSION COMPANY

Richard J. Aaron
Courtney F. Kissel
Olivia R.C.A. Flower
Hannah E. Buzolits
201 Townsend Street, Suite 900
Lansing, MI 48933
RAaron@dykema.com
CKissel@dykema.com
OFlower@dykema.com
HBuzolits@dykema.com

THE KROGER COMPANY

Michael L. Kurtz
Kurt J. Boehm
Jody Kyler Cohn
Boehm, Kurtz & Lowry
36 East Seventh Street, Suite 1510
Cincinnati, OH 45202
mkurtz@BKLawfirm.com
KBoehm@BKLawfirm.com
JKylerCohn@BKLawfirm.com

Kroger Consultant

Justin Bieber

jbieber@energystrat.com

MICHIGAN ATTORNEY GENERAL

Joel King

Assistant Attorney General

ENRA Division

525 W. Ottawa Street, 6th Floor

P.O. Box 30755

Lansing, MI 48909

KingJ38@michigan.gov

ag-enra-spec-lit@michigan.gov

AG Consultant

Seb Coppola

sebcoppola@corplytics.com

MICHIGAN CABLE

TELECOMMUNICATIONS ASSOC.;

ZECO SYSTEMS, INC. D/B/A

GREENLOTS

Sean P. Gallagher

Fraser Trebilcock Davis & Dunlap

124 West Allegan Street, Suite 1000

Lansing, MI 48933

sgallagher@fraserlawfirm.com

Justin Mann, Legal Assistant

jmann@fraserlawfirm.com

**MICHIGAN MUNICIPAL ASSOCIATION
FOR UTILITY ISSUES**

Valerie J.M. Brader

Rivenoak Law Group P.C.

3331 W. Big Beaver Rd., Suite 109

Troy, MI 48084

valerie@rivenoaklaw.com

Linda Hofrichter

Rick Bunch

lhd@rivenoaklaw.com

rick@mi-maui.org

MPSC STAFF

Heather M.S. Durian

Michael J. Orris

Amit T. Singh

Monica M. Stephens

Public Service Division

7109 West Saginaw Hwy, 3rd Floor

Lansing, MI 48917

durianh@michigan.gov

orrism@michigan.gov

singha9@michigan.gov

stephensm11@michigan.gov

Lori Mayabb

MPSC Staff Case Coordinator

mayabbl@michigan.gov

**SOULARDARITY; WE WANT GREEN,
TOO**

Mark Templeton

Amanda Urban

Jacob Schuhardt

Sam Heppell

Boris Lukanov

Joseph Amdur

Claire Black

Michelle David

Jason Frey

Andrew Kieffer

Ellie Maltby

Andrew Obeso

Ivy Truong

Jesse Bernes-Zieve

Josh Bretthauer

Sara Macedo

Serendipity Welsh

Adriel Ghadoushi

University of Chicago Law School
Abrams Environmental Law Clinic
6020 South University Avenue
Chicago, IL 60637
templeton@uchicago.edu
t-9aurba@lawclinics.uchicago.edu
jschuhardt@uchicago.edu
heppell@uchicago.edu
blukanov@psehealthyenergy.org
aclc_mpsc@lawclinic.uchicago.edu

Justin Schott
jbschott@umich.edu

Madison S. Wilson, Legal Assistant
madisonswilson@uchicago.edu

UTILITY WORKERS LOCAL 223

Ben King
3950 W. 11 Mile Road
Berkley, MI 48072
bking@michworkerlaw.com

WAL-MART

Melissa M. Horne
Higgins, Cavanagh & Cooney, LLP
10 Dorrance Street, 4th Floor
Providence, RI 02903
mhorne@hcc-law.com



Daniel Abrams
Environmental Law & Policy Center
dabrams@elpc.org