
O L S O N , B Z D O K & H O W A R D



June 13, 2023

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

Via E-Filing

RE: MPSC Case No. U-21297

Dear Ms. Felice:

The following is attached for paperless electronic filing:

Direct Testimony and Exhibits of Chris Neme on behalf of Michigan Environmental Council, Natural Resources Defense Council, Sierra Club, and Citizens Utility Board of Michigan (Exhibit MEC-7 through MEC-8); and

Proof of Service.

Sincerely,

Christopher M. Bzdok
chris@envlaw.com

xc: Parties to Case No. U-21297

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 rules governing the distribution and
supply of electric energy, and for
miscellaneous accounting authority.

U-21297

DIRECT TESTIMONY OF CHRIS NEME

ON BEHALF OF

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

June 13, 2023

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1 **I. INTRODUCTIONS AND QUALIFICATIONS**

2 **Q. Please state your name, employer and business address.**

3 A. My name is Chris Neme. I am a co-founder and Principal of Energy Futures Group, a
4 consulting firm that provides specialized expertise on energy efficiency, demand response,
5 renewable energy, strategic electrification and other clean energy markets, programs and
6 policies. My business address is P.O. Box 587, Hinesburg, VT 05461.

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

8 A. I am testifying on behalf of Michigan Environmental Council, Natural Resources Defense
9 Council, and Sierra Club, and the Citizens Utility Board of Michigan, collectively “MNSC.”

10 **Q. Please describe your educational background.**

11 A. I received a Master of Public Policy degree from o the University of Michigan (Ann Arbor)
12 in 1986. That is a two-year, multi-disciplinary degree focused on applied economics,
13 statistics and policy development. I also received a Bachelor’s degree in Political Science
14 from the University of Michigan (Ann Arbor) in 1985. My first year of graduate school
15 counted towards both my Masters’ and Bachelor’s degrees.

16 **Q. Please summarize your business and professional experience.**

17 A. I have worked in the energy industry for more than thirty years for clients in more than 30
18 different states, half a dozen Canadian provinces and several European countries. My work
19 has focused on utility system planning, with particular focus on markets, programs and
20 policies regarding energy efficiency, demand response, and other distributed energy
21 resources. That has included development and analysis of policies and pathways for
22 decarbonizing the energy sector, including strategic electrification. Much of my work
23 includes economic analysis, including benefit-cost analyses of various distributed energy

resources and electrification measures. A copy of my curriculum vitae is attached as Exhibit MEC-7.

Q. Can you provide examples of projects on which you have worked since co-founding Energy Futures Group (EFG)?

A. I co-founded Energy Futures Group in 2010. Since then, I have played lead roles in a variety of energy efficiency consulting projects. Recent examples include:

- Representing NRDC in both informal consultations and contested regulatory proceedings in Michigan, Illinois and Ohio on energy efficiency, and demand response program designs, cost-effectiveness analyses, evaluation, and shareholder incentive structures; distribution system planning and non-wires alternatives; electrification analysis, programs and policies; and integrated resource planning;
- Assisting the Sierra Club in providing technical input on gas utility decarbonization pathways and policies as part of the Massachusetts Future of Gas utility-stakeholder collaborative process and subsequent regulatory process;
- Co-leading a multi-stakeholder Vermont working group, co-authoring a white paper and providing legislative testimony and technical support on the policy concept of a Clean Heat Standard – a performance standard that would impose increasing annual obligations on Vermont Gas as well as the state’s wholesale suppliers of fuel oil and propane to reduce greenhouse gas emissions;
- Serving as an appointed expert representative on both the Ontario Energy Board’s Gas Integrated Resource Planning (IRP) Technical Working Group and its Evaluation and Audit Committee for gas demand-side management;

- 1 • Co-authoring the 2020 *National Standard Practice Manual for Benefit-Cost Analysis*
2 *of Distributed Energy Resources* (NSPM for DERs) and its 2017 predecessor *National*
3 *Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*
4 (NSPM for EE), as well as providing technical support to numerous state regulators,
5 utilities and other stakeholders in applying the guidance from these manuals;
- 6 • Leading a project for the Northeast Energy Efficiency Partnerships (“NEEP”) to
7 document lessons learned from utility and other efforts across the United States over
8 the past 25 years to use geographically targeted efficiency programs (sometimes in
9 concert with other distributed resources) to cost-effectively defer capital investment in
10 transmission and/or distribution system infrastructure; and
- 11 • Drafting policy reports for the Regulatory Assistance Project on a variety of energy
12 efficiency and related regulatory policy issues, such as whether 30% electric savings is
13 achievable in ten years, the history of efforts across the United States to use
14 geographically targeted efficiency programs to cost-effectively defer transmission and
15 distribution system investments, and the history of bidding of efficiency resources into
16 the PJM and New England capacity markets.

17 **Q. Have you previously filed expert witness testimony in other proceedings before the**
18 **Commission?**

19 A. Yes. I filed testimony in the following Michigan Public Service Commission dockets:

- 20 • U-21193, regarding DTE’s characterization and modeling of energy waste reduction
21 resources for its integrated resource plan;
- 22 • U-21224, regarding the merits of a propane electrification pilot program in Consumers
23 Energy’s 2022 rate case;

- 1 • U-20836, regarding the merits of a propane electrification pilot program in DTE’s rate
2 case;
- 3 • U-21090, regarding Consumers Energy’s characterization and modeling of energy
4 efficiency, demand response and conservation voltage regulation in its integrated
5 resource plan;
- 6 • U-20881, regarding DTE’s 2022-2023 gas waste reduction plan;
- 7 • U-20876, regarding DTE’s 2022-2023 electric waste reduction plan;
- 8 • U-20697, regarding Consumers Energy’s proposed shareholder incentive for
9 investment conservation voltage regulation;
- 10 • U-20429, regarding DTE’s 2020-2021 gas energy waste reduction plan;
- 11 • U-20373, regarding DTE’s 2020-2021 electric energy waste reduction plan;
- 12 • U-20471, regarding DTE’s assessment of energy efficiency resources in its Integrated
13 Resource Plan;
- 14 • U-20164, regarding Consumers Energy’s proposed new shareholder incentive
15 mechanism for demand response programs;
- 16 • U-18419, regarding DTE’s assessment of efficiency potential as part of its IRP put
17 forward by the Company in support of a proposed new gas-fired power plant;
- 18 • U-18268, regarding DTE’s proposed 2018-2019 gas energy efficiency programs
19 (Energy Waste Reduction) plan;
- 20 • U-18262, regarding DTE’s proposed 2018-2019 electric energy efficiency programs
21 (Energy Waste Reduction) plan;
- 22 • U-18261, regarding Consumers Energy Company’s proposed 2018-2021 energy
23 efficiency programs (Energy Waste Reduction) plan;

- 1 • U-17771, regarding Consumers Energy Company's proposed amendment to its 2017
- 2 energy efficiency programs (Energy Waste Reduction) plan;
- 3 • U-17762, regarding DTE's proposed amendment to its 2017 energy efficiency
- 4 programs (Energy Waste Reduction) plan;
- 5 • U-17429, regarding Consumers Energy's estimates of energy efficiency potential in its
- 6 assessment of alternatives to its proposal to construct a new 700 MW gas-fired power
- 7 plant (Thetford);
- 8 • U-17138, regarding Consumers Energy's proposed modifications to its 2013-2015
- 9 Energy Optimization plans;
- 10 • U-17049, regarding DTE's proposed modifications to its 2013-2015 Energy
- 11 Optimization plan;
- 12 • U-16670, regarding Consumers Energy's biennial review and Amended Energy
- 13 Optimization plan; and
- 14 • U-16671, regarding DTE's biennial review and Amended Energy Optimization plan.

15 **Q. Have you been an expert witness on energy efficiency matters before other regulatory**
16 **commissions?**

17 A. Yes, I have filed expert witness testimony in approximately 50 dockets before similar
18 regulatory bodies in twelve other states and provinces, including the neighboring
19 jurisdictions of Ohio, Illinois and Ontario.

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

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

22 Exhibit MEC-7: CV of Christopher Neme

23 Exhibit MEC-8: Response to MNSCDE-5.3b, d+e

1 **II. TESTIMONY OVERVIEW**

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

3 A. The purpose of my testimony is to address the reasonableness of DTE’s proposed pilot
4 program for electrification of residential customers who heat their homes with delivered fuels
5 (e.g., propane and fuel oil). In particular, I identify several shortcomings of DTE’s proposal
6 and offer recommendations for addressing those shortcomings.

7 **Q. Please summarize your conclusions regarding DTE’s proposal.**

8 A. The concept of a pilot program for electrifying DTE residential customers who use propane
9 or fuel oil is a good one. Electrification of fossil fuel use in homes and businesses has been
10 shown to be absolutely essential to meeting climate goals. In fact, the MI Healthy Climate
11 Plan explicitly calls for electrification programs targeting propane, fuel oil and other
12 delivered fuel use in order for the state to begin to lower building sector emissions. It is also
13 clear that electrification of propane, fuel oil and kerosene-heated homes is cost-effective
14 today – lowering heating bills from Day 1. Moreover, because of the big difference between
15 DTE’s electric rates and the actual marginal cost of serving additional electric load,
16 electrification can lower electric rates. Finally, given the urgency of the climate challenge,
17 the significant market barriers to adoption of cold climate heat pumps, and the reality that it
18 will likely take decades to fully transform the existing building stock, it is important that
19 electrification initiatives begin as soon as possible.

20 That said, I have several concerns regarding the specifics of DTE’s proposal. They are as
21 follows:

- 1 1. **Insufficient scale to learn what it takes to begin to move the market for heat**
2 **pumps.** DTE’s proposed pilot participation numbers – i.e., on the order of 300-400
3 per year and staying relatively flat across all five years – is just not enough to learn
4 what it takes to move the market.
- 5 2. **Lack of commitment to ensuring low-income participation.** DTE has no low-
6 income participation goal and the small additional rebate it is proposing to offer
7 low-income households is unlikely to be adequate to result in optimal heat pump
8 solutions for such customers.
- 9 3. **Not limiting the program to cold climate heat pumps models.** DTE’s proposed
10 minimum efficiency standards for air source heat pumps (ASHPs) do not include
11 cold climate performance requirements. In fact, DTE’s proposed standards are not
12 even as stringent as IRA tax credit requirements. Thus, the Company risks creating
13 norms in the heat pump market that are far short of what is economically optimal
14 for the state and the Company’s customers in the long-run.
- 15 4. **Lack of a plan to help customers weatherize and improve the efficiency of their**
16 **homes while electrifying.** The result will almost certainly be missed opportunities
17 to optimize the performance of electrified homes.
- 18 5. **Insufficient plan for collaboration with stakeholders on program plan**
19 **development, implementation and refinement over time.** The Company has
20 proposed creating a stakeholder working group, but only for once-a-year meetings.
21 That is insufficient to enable robust collaboration on this important initiative.

1 **Q: Please summarize your recommendation for the Michigan Public Service Commission.**

2 A: My recommendations can be summarized as follows:

3 1. In order to enable the getting started, I recommend that the Commission approve
4 DTE's proposed pilot program for 2024 with just the following three conditions:

- 5 a. Only promoting ASHPs that meet the cold climate Energy Star standard;
- 6 b. Attempting to maximize ASHP participation – significantly beyond levels
7 proposed by DTE, through increased rebate levels, increased marketing
8 efforts and/or other means;
- 9 c. Attempting to achieve significant participation by low-income
10 households; and
- 11 d. Approving a doubling of the rebate budget proposed by DTE.

12 2. To ensure a more robust program that is oriented more towards better understanding
13 what it takes to move the heat pump market, as well as more equitable and more
14 comprehensive, I recommend that DTE work with stakeholders to further modify
15 the program for 2025 and 2026 and to file those revisions no later than March 31,
16 2024 (or earlier if necessary to get approval by the end of calendar year 2024). I
17 further recommend that DTE ensure that the revised program for 2025 and 2026 be
18 consistent with the following principles:

- 19 a. Making an understanding of what it takes to move the heat pump market
20 a central goal of the program;
- 21 b. Aiming to electrify space heating in 3000 homes by the end of 2026;

- c. Aiming to ensure that at least one-third of participants are low-income households;
- d. Paying 100% of any incremental costs – i.e., costs over and above what would be covered by IRA rebates – for low-income households;
- e. Aggressively promoting the integration of electrification and building envelope efficiency by offering free professional energy audits to all participants, connecting low-income customers to state/federal and DTE weatherization and energy efficiency programs, and offering bonus rebates for weatherization measures to non-low-income participants.

1 **III. BENEFITS OF ELECTRIFYING RESIDENTIAL PROPANE AND FUEL OIL USE**

2 **Q. DTE has proposed a pilot program to promote electrification of homes in its electric**
3 **service territory that currently heat with propane, fuel oil or other delivered fuels.**
4 **What benefits has DTE suggested that such electrification would provide?**

5 **A:** DTE suggests that heat pumps can provide substantial benefits when displacing propane or
6 fuel oil. They include:

- 7 1. **Emission reductions.** DTE states that electrifying propane and fuel oil heating will
8 reduce greenhouse gas emissions immediately, with those reductions growing over
9 time as the DTE grid gets cleaner.¹
- 10 2. **Customer bill savings.** DTE also states that electrifying propane and fuel oil
11 heating will lower those customers' energy bills by hundreds of dollars per year.²
- 12 3. **Electric rate reductions.** DTE estimates that its proposed pilot program would
13 lower electric rates by \$6.3 million. This is because the added revenue from
14 increased electricity sales (primarily in winter), coupled with summer peak demand
15 savings resulting from more efficient air conditioning, would more than offset its
16 proposed program costs.³

¹ Direct testimony of Kelsey Peterson, p. 70, line 18 through p. 71, line 2.

² Ibid, p. 70, lines 5-16.

³ Ibid, p. 84, line 14 through p. 85, line 18.

1 **Q. Do you agree with DTE’s conclusion that electrification will reduce greenhouse gas**
2 **emissions?**

3 A: Yes. The references provided by DTE suggest that electrification of propane and/or fuel oil
4 consumption will reduce greenhouse gas emissions right away and that those reductions will
5 get bigger over time as the electric grid gets cleaner. Moreover, I suspect the emissions rates
6 assumed in that study are average or short-run marginal rates. The more appropriate rates for
7 assessing the impacts of policies or programs are long-run marginal emissions rates.⁴ Based
8 on long-run marginal emissions rates for Michigan,⁵ I estimate that a cold climate air source
9 heat pump would produce roughly half as much carbon dioxide emissions per unit of heat
10 output today as a propane or fuel oil furnace.⁶

11 **Q. Do you agree with DTE’s conclusion that electrification of propane and fuel oil heated**
12 **homes will reduce those customers’ energy bills?**

13 A: Yes. As DTE noted, both the MI Healthy Climate Plan and other studies such as a recent
14 Rewiring America report have concluded that customers currently using propane or fuel oil
15 for space heating would likely save on the order of \$500 a year or more on their energy bills

⁴ Gagnon, Pieter and Wesley Cole (National Renewable Energy Laboratory), “Planning for the evolution of the electric grid with a long-run marginal emissions rate”, published in iScience, Volume 25, Issue 3, 18 March 2022 (<https://www.sciencedirect.com/science/article/pii/S2589004222001857>).

⁵ Based on forecasts developed by the National Renewable Energy Laboratory through its Cambium model the long-run marginal emissions rate of CO2 combustion is forecast to be 343.9 kg/MWh in 2024 in Michigan (<https://scenarioviewer.nrel.gov/?project=82460f06-548c-4954-b2d9-b84ba92d63e2&mode=view&layout=Default>).

⁶ This assumes an average annual coefficient of performance (COP) in heating mode of 2.50 for the heat pump, an average COP of 0.86 for a propane or oil furnace and average rates of CO2 emissions from combustion of 62.87 kg/MMBtu for propane and 73.96 kg/MMBtu for residential fuel oil based on U.S. Environmental Protection Agency estimates (https://www.epa.gov/sites/default/files/2015-07/documents/emission-factors_2014.pdf).

1 as a result of electrification.⁷ In testimony I filed in DTE's rate case last year, I estimated
2 that replacing a residential propane heating system in DTE's service territory with a cold
3 climate air source heat pump would produce annual bill savings of over \$700 and that
4 replacing a propane water heater with an electric heat pump water heater would save an
5 additional \$450+ dollars.⁸ I have not updated that analysis, but have no reason to expect the
6 results to be materially different given today's propane and electricity prices.

7 **Q. Do you agree with DTE's conclusion that its electrification pilot would reduce electric**
8 **rates over the life of the electrification measures installed?**

9 A: Yes. I have not confirmed the precise magnitude by which DTE estimates that its proposed
10 pilot program would put downward pressure on rates. However, I am confident that there
11 will be downward pressure. Indeed, I reached a similar conclusion in an analysis I presented
12 in direct testimony in DTE's rate case last year, despite assumptions of considerably larger
13 rebates per heat pump than those proposed by DTE in this proceeding.⁹ While I have not
14 updated my analysis from last year, the primary driver of downward pressure on rates – i.e.,
15 a very large difference between the price residential customers pay per kWh of electricity
16 consumption in rates and the marginal cost of serving additional electric load – remains.
17 Thus, I have no reason to expect the results of analysis today to be materially different from
18 the results I generated last year.

19 **Q: Are there additional benefits from electrification of propane and fuel oil homes beyond**
20 **those identified by DTE in its presentation of its proposed pilot program?**

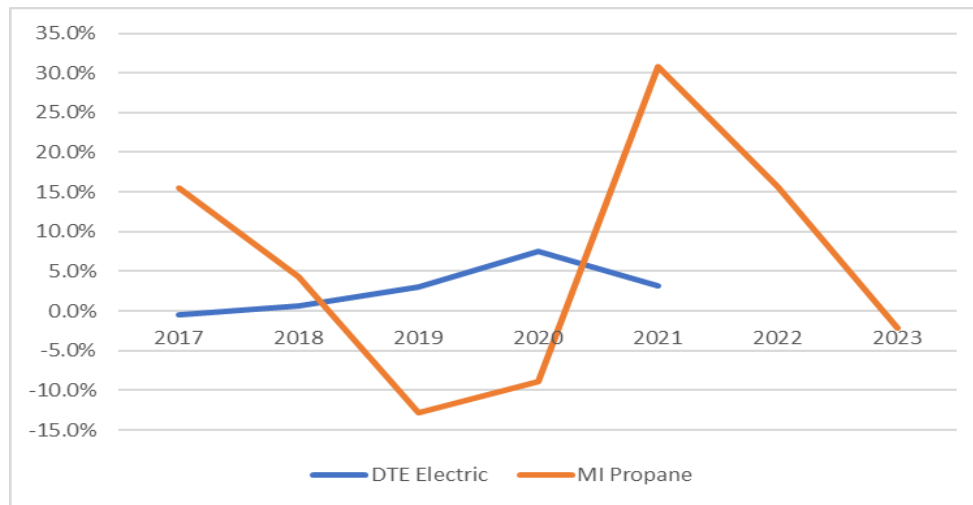
⁷ Peterson Direct, p. 70, lines 5-16 and p. 71, Table 10.

⁸ Direct testimony of Chris Neme in Case No. U-20836, p. 12, Table 1.

⁹ Ibid., p. 19, Table 2.

A: Yes. For example, as Figure 1 shows, in addition to reducing energy bills, electrification reduces the volatility that customers experience with energy bills because electricity prices tend to be much more stable than fossil fuel prices. In addition, electrification of some fossil fuel appliances can reduce indoor air pollution, which can have positive health ramifications.

Figure 1: % Change in Average Annual DTE Residential Electricity and Michigan Residential Propane Prices¹⁰



¹⁰ Average DTE residential revenue per kWh from U.S. Energy Information Administration, Electric Sales, Revenue, and average Price, Table 6: Residential sector (https://www.eia.gov/electricity/sales_revenue_price/). Electric data only available through 2021. Average Michigan residential propane prices from U.S. Energy Information Administration, Weekly Heating Oil and Propane Prices (https://www.eia.gov/dnav/pet/PET_PRI_WFR_DCUS_SMI_W.htm). Annual changes in graph are based on annual averages of weekly values for the months of January, February, March, November and December – consistent with the heating season and the only months for which EIA provides data. Note that these annual changes mask differences understate differences in price volatility because propane prices can vary significantly not only year to year, but month to month and sometimes even week to week.

1 **Q: Given the benefits of electrification of propane and oil heated homes, is there evidence**
2 **that such homes are switching to electric heat pumps?**

3 A: I am not aware of any evidence that propane and/or oil heated homes in DTE’s service
4 territory, or Michigan generally, are switching to electric heat pumps. In fact, DTE’s 2021
5 (i.e., its most recent) Residential Appliance Saturation Survey estimates that only about 4%
6 of households across its service territory have any kind of heat pump.¹¹ That is about two
7 percentage points *lower* than estimated in its 2016 survey.¹² The results are no different for
8 the northeastern part of the utility service territory which has the highest percentage of
9 households that use propane or fuel oil – 4% heat pumps in 2021 compared to 5% in 2016.¹³

¹¹ Ipsos, Residential Customer Appliance Survey, October 29, 2021, provided in response to MNSCDE-5.1e.

¹² Ipsos, 2016 Residential Customer Appliance Saturation Survey, provided in response to NRDCDE-1.5 in Docket U-20373.

¹³ The small declines in heat pump penetrations between 2016 and 2021 may not be statistically significant.

1 IV. GOALS OF A PROPANE AND FUEL OIL ELECTRIFICATION PILOT

2 **Q: What has DTE suggested are the goals of its proposed electrification pilot?**

3 A: DTE has identified six specific “learnings” that it is seeking to obtain through its proposed
4 pilot:

- 5 • Enabling the company to identify customers who have heat pumps through its
6 advanced metering infrastructure;
- 7 • Understanding heat pump adoption rates in different parts of its service
8 territory;
- 9 • Understanding the actual operating efficiency and other aspects of the
10 performance of heat pumps in its service territory;
- 11 • Understanding customer and contractor perceptions and satisfaction with heat
12 pumps;
- 13 • Improving understanding of the cost-effectiveness of heat pumps in its service
14 territory; and
- 15 • Understanding the impacts of heat pumps on its electric grid.¹⁴

16 **Q: Are those appropriate goals?**

17 A: There is a glaring omission from DTE’s stated objectives for its pilot. Specifically, the
18 Company has not made an understanding of what it will take to significantly grow the market
19 for heat pumps a core objective of its proposed pilot. Developing that understanding should
20 be its primary objective.

¹⁴ Peterson Direct, p. 82, lines 9-15.

1 While DTE's other stated goals and the information the Company would collect to address
2 those goals would have *some* value, I believe that DTE is placing too much emphasis on
3 most of them. Put simply, DTE is focusing its pilot primarily on technical learnings when it
4 should instead be focusing as much or more on market learnings.

5 **Q: Why should building an understanding of what it takes to grow the market for heat**
6 **pumps be the primary objective of a pilot program?**

7 A: It is clear from every independently conducted decarbonization pathways study with which
8 I am familiar that *massive* levels of electrification of all fossil fuel heating systems – propane,
9 oil and gas – are necessary to achieve the levels of greenhouse gas emission reductions
10 necessary to stabilize the climate. For example, a recent national study by Princeton
11 University examined five different technological and economically plausible pathways for
12 the U.S. to achieve net zero GHG emissions by 2050 and found that substantial levels of
13 electrification of buildings was required in all scenarios.¹⁵ Even a recent study funded by the
14 Massachusetts gas utilities concluded building electrification was one of several “low regret”
15 decarbonization strategies across all of the scenarios analyzed, with annual gas throughput
16 declined by at least 57% in all but one of the eight scenarios analyzed and by 73% in the
17 “hybrid electrification” scenario found to be lowest cost.¹⁶ And that is despite criticisms from
18 a number of stakeholders, including the Massachusetts Attorney General's office, that the

¹⁵ Larson, Eric et al. (Princeton University), *Net-Zero America: Potential Pathways, Infrastructure and Impacts, Final Report Summary*, October 29, 2021 ([https://netzeroamerica.princeton.edu/img/Princeton%20NZA%20FINAL%20REPORT%20SUMMARY%20\(29Oct2021\).pdf](https://netzeroamerica.princeton.edu/img/Princeton%20NZA%20FINAL%20REPORT%20SUMMARY%20(29Oct2021).pdf)).

¹⁶ Energy and Environmental Economics, *The Role of Gas Distribution Companies in Achieving the Commonwealth's Climate Goals*, filed in Massachusetts D.P.U. Docket 20-80, March 18, 2022 (<https://thefutureofgas.com/content/downloads/2022-03-21/3.18.22%20-%20Independent%20Consultant%20Report%20-%20Decarbonization%20Pathways.pdf>).

1 study was biased against electrification and in favor of biofuels.¹⁷ Given that customers
2 typically purchase new central heating and/or cooling equipment only once every 15 to 20
3 years, if we do not start to significantly accelerate customer adoption of heat pumps soon,
4 we will fail to achieve the level of emission reductions necessary to meet climate goals. Thus,
5 it is critically important that we better understand both the barriers to accelerating heat pump
6 sales in Michigan and how to overcome those barriers – and that we begin to learn those
7 lessons as soon as possible.

8 It should also be noted that every propane or oil heating customer who replaces their existing
9 heating system with another propane or oil system, rather than with a heat pump, will miss
10 an important, once every 15- to 20-year opportunity to significantly and affordably reduce
11 their energy bills.¹⁸ At the same time, DTE will miss an important opportunity to lower
12 electric rates by spreading fixed and sunk costs across a broader base of sales will also have
13 been missed.

¹⁷ For example, see <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/14922666> and <https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/14922536>.

¹⁸ It is much less expensive to switch to a heat pump when a customer otherwise would have purchased a new propane or oil heating system (and/or central air conditioner). In that situation, the capital cost of electrification is simply any incremental cost between a fossil fuel heating system (with a central air conditioner) and a heat pump. Once a new propane or oil heating system has been purchased, the capital cost of electrification is the full cost (rather than just the incremental cost) of a new heat pump.

1 **Q: Is the objective of quickly growing the market for heat pumps consistent with the MI**
2 **Healthy Climate Plan?**

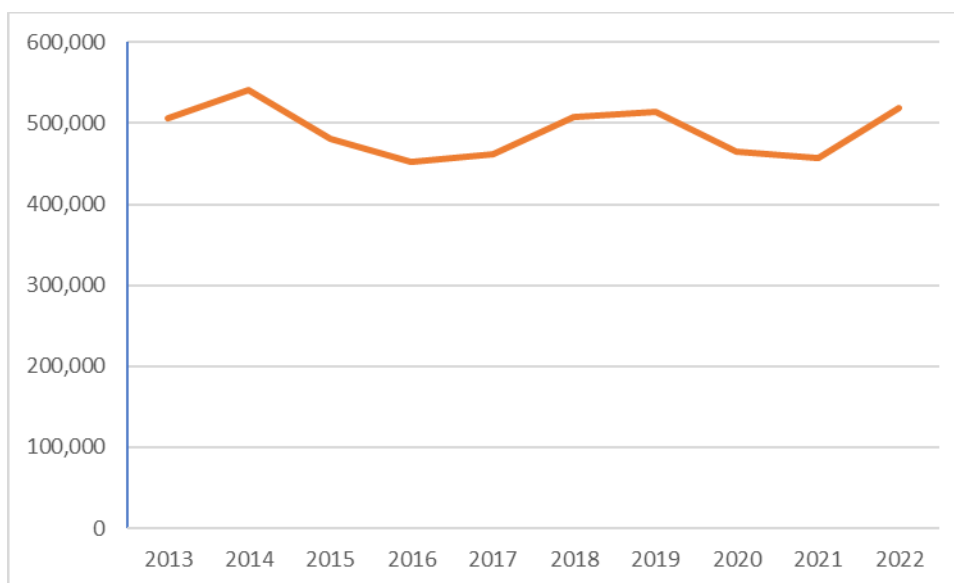
3 A: Yes. The MI Healthy Climate Plan set a goal of reducing emissions related to heating
4 Michigan homes and business by 17% by 2030 – or about 3% per year.¹⁹ It is clear that gas
5 efficiency programs, while important, will not enable the state to reach such goals by
6 themselves because they are currently achieving annual savings of only about 1.0%.²⁰
7 Moreover, that 1.0% annual savings level is relative to a baseline of what sales would have
8 been absent new efficiency measures rather than an absolute reduction in gas sales.²¹ In other
9 words, the annual savings can be partially, fully or more than fully offset each year by
10 increased sales resulting from either new customers (e.g., new construction) or existing
11 customers whose demand grows for any mix of reasons. Indeed, as Figure 1 shows, while
12 annual natural gas sales in Michigan have fluctuated a little from year to year, probably in
13 response to differences in economic conditions and differences in severity of winters, they
14 have stayed relatively unchanged (rather than having noticeably declined) over the past ten
15 years.

¹⁹ Michigan Department of Environment, Great Lakes and Energy, MI Healthy Climate Plan, April 2022, p. 42 (<https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Offices/OCE/MI-Healthy-Climate-Plan.pdf?rev=d13f4adc2b1d45909bd708cafccbfffa&hash=99437BF2709B9B3471D16FC1EC692588>).

²⁰ The MI Healthy Climate Plan recommends that natural gas efficiency program savings goals be increased to 1.5% per year, but even at that level significant investment in other emission reducing measures would be needed to reach the emissions reduction goal the plan sets for the state.

²¹ Presumably the same would be true for the MI Health Climate Plan recommendation that natural gas utility savings goals be increased to 1.5% per year.

Figure 2: Michigan Natural Gas Sales to Residential and Commercial Customers (MMcf)²²



That is undoubtedly why, among other things, the MI Healthy Climate Plan calls not only for increased energy efficiency investments but also for the establishment of “incentive programs for electric appliances and heat pumps” targeted to cases in which electric technology will save customers money today, including for homes currently burning propane or fuel oil.²³ For such incentive programs to materially contribute to achieving the goal of reducing emissions from buildings by 17% by 2030, they would need to be launched and ramped up very quickly.

²² Data from U.S. Energy Information Administration
(https://www.eia.gov/dnav/ng/ng_cons_sum_a_EPG0_vgt_mmcf_a.htm).

²³ MI Healthy Climate Plan, p. 43.

1 **Q: Can you elaborate on why some of the other goals that DTE has put forward for its**
2 **pilot are not as important as the goal of improving our understanding of what it takes**
3 **to move the heat pump market forward?**

4 A: With regard to DTE’s first two stated objectives, the Company has suggested that it would
5 like to better understand which of its current customers have heat pumps to “inform future
6 marketing, outreach, and program design.”²⁴ However, given that current heat pump
7 saturations are very low in DTE’s service territory and are likely to remain quite low for a
8 while, it is hard to see how that information would be useful for marketing or program design
9 for at least the next five years and probably much longer than that. In other words, this seems
10 more like “nice to have” rather than “important to have”, let alone “critical to have”
11 information.

12 With regard to the third objective of gaining a better understanding of heat pump
13 performance, it is important to recognize that while current heat pump technology is
14 relatively untested in Michigan, there is a substantial amount of data on heat pump
15 performance in other states with climates similar to DTEs. That is not to suggest that
16 performance data specific to DTE’s service territory would not be useful. It could be,
17 particularly if it was separately collected for different types of heat pumps, such as hybrid
18 systems that use fossil fuel as back-up heating and all-electric systems that use electric
19 resistance as back-up heat. However, it isn’t the most important potential learning from a
20 pilot.

²⁴ DTE response to MNSCDE-5.6ai.

1 With respect to the fourth stated goal, I agree that there is value in increasing understanding
2 of customer and contractor perceptions of heat pumps. In fact, this objective is the only
3 objective articulated by DTE that is related to better understanding market barriers to heat
4 pumps. Thus, it is an important goal. However, while understanding barriers is important, it
5 is also important to test what it takes to overcome those barriers.

6 With respect to DTE's fifth stated goal, I agree that it is important to understand the cost-
7 effectiveness of heat pumps for DTE's customers. However, we cannot really understand the
8 long-term cost-effectiveness of heat pumps until we reach a point in the development of the
9 market in which heat pumps are not special orders and/or sold only by a few contractors. Put
10 simply, we need to develop the market to the point where there is significant competition and
11 some economies of scale before any useful conclusions about cost-effectiveness can be
12 reached. DTE's pilot – with 1800 heat pumps for space heating over five years, or an average
13 of about 360 per year – will not take us to that point.

14 With respect to DTE's sixth goal, I agree that enhancing the Company's understanding of
15 how electrification will affect its electric grid is a useful and important objective. However,
16 the learnings would be greater if the pace and amount of electrification the pilot was
17 achieving was greater than DTE is planning.

18 To summarize, there is nothing inherently wrong or problematic with any of DTE's stated
19 goals for its pilot. They just are not as pressing or valuable as the goal of understanding what
20 it would take to move the market for heat pumps.

1 **Q: What is the implication of DTE’s decision to not make understanding how to grow the**
2 **heat pump market a central goal of its proposed pilot?**

3 A: Because DTE did not make understanding how to grow the heat pump market its central
4 goal (or even one of several primary goals), it is not designed to provide that understanding
5 and is unlikely to significantly enhance our collective knowledge of what it takes to move
6 the heat pump market.

1 **V. CONCERNS WITH THE DESIGN OF DTE’S PROPOSED PILOT**

2 **A. Overview**

3 **Q. What are your concerns regarding the design of DTE’s proposed propane and fuel oil**
4 **electrification pilot?**

5 A. I have several concerns. They are as follows:

- 6 1. Insufficient scale to learn what it takes to begin to move the market for heat pumps.
7 2. Lack of commitment to ensuring low-income participation.
8 3. Not limiting the program to cold climate heat pumps models – i.e., the type of heat
9 pumps that will need to be the foundation of a future energy transition for the state.
10 4. Lack of a plan to help customers weatherize their homes while electrifying.
11 5. Insufficient plan for collaboration with stakeholders on program plan development,
12 implementation and refinement over time.

13 **B. Insufficient Scale to Learn What it Takes to Change the Heat Pump Market**

14 **Q. What is the size of DTE’s proposed pilot program?**

15 A. DTE is proposing to rebate 1500 air source heat pumps (ASHPs), 300 geothermal or ground
16 source heat pumps (GSHPs) and 300 heat pump water heaters (HPWHs) over five years. It
17 appears from the Company’s proposed budget – i.e., rebate spending that stays relatively
18 constant over the proposed five-year period of the pilot – that DTE is planning for
19 participation levels to remain relatively flat over the five-year period.²⁵

²⁵ The Company’s workpapers suggest its plan for 2024 is to get 250 ASHP participants, or slightly little less than one-fifth of its proposed five-year total (response to MNSCDE-5.4). However, DTE’s proposed rebate budget for 2024 is \$667 thousand, or almost exactly one-fifth of its total five-year rebate budget of \$3.308 million (Direct Testimony of Kelsey Peterson, p. 83, Table 7). The proposed rebate budget actually

1 The Company estimates that its annual participation rate for ASHPs will be equal to about
2 3% of propane and oil heating customers who are both in the market each year to replace
3 their existing heating systems.²⁶

4 **Q. Are those reasonable goals?**

5 A. No. As discussed in the previous section of my testimony, a central goal of DTE's pilot
6 program should be to test what it takes to move the heat pump market. Being satisfied with
7 a 3% market share – not only for the first year, but for all five years of a pilot program – is
8 completely inconsistent with that objective.

9 **Q. What would be a more reasonable participation trajectory?**

10 A. As I discussed in my direct testimony in DTE's 2022 rate case, the Company should aim to
11 achieve 3000 space heating conversions within three years. That does not mean 1000 per
12 year for each of the next three years. Rather, there should be a ramp up over time – perhaps
13 along the lines of 500 homes in the first year, 1000 homes in the second year and 1500 homes
14 in the third year. The growth in the market over time is particularly important, as that is the
15 ultimate indicator of success in changing the market. It is also important that the pilot focus
16 on a shorter time horizon than the Company's proposed five years.

declines by 8% from 2024 to 2025 and again declines slightly from 2025 to 2026, before ramping up to a level in 2027 that is similar to 2024.

²⁶ DTE assumed that it would reach 4% of propane and oil heat customers who are both in the market for a new heating system *and* already have central A/C (Direct testimony of Kelsey Peterson, p. 81, lines 9-14). The Company estimates that 77% of propane and oil heat customers have central A/C (response to MNSCDE-5.4), so 4% of customers that already have central A/C translates to about 3% of customers with or without central A/C ($0.04 * 0.77 = 0.03$). The Company suggests that it focused on customers that already have central A/C because customers without it “may be less likely to convert to ASHPs” (Direct testimony of Kelsey Peterson, p. 81, lines 13-14). In my experience, that is not a reasonable assumption. In fact, customers who did not have air conditioning and wanted to add it were one of the key drivers of participation in the early years of programs to promote electrification with heat pumps in New England.

1 **Q. Why is it important that an electrification pilot focus on a time horizon of three years**
2 **instead of the five years DTE proposed for its pilot?**

3 A. As I discussed in the previous section of my testimony, achieving the levels of electrification
4 necessary for the state to decarbonize its economy is going to take decades, so we cannot
5 afford to wait for the results of a five-year pilot to begin electrification at a significant scale.
6 Again, the MI Healthy Climate Plan set a goal of a 17% reduction in building emissions by
7 2030. DTE cannot possibly make a meaningful contribution to achieving that goal if it
8 completes a pilot whose heating electrification participation peaks at something on the order
9 of 400 homes in 2028.²⁷

10 **Q. How does the scale of Consumers Energy’s propane electrification pilot compare to**
11 **DTE’s proposed pilot?**

12 A. Consumers is planning to electrify space heating in 2000 homes in its service territory over
13 three years. Note that Consumers has almost 20% fewer residential customers and 20% less
14 residential electricity sales and revenue than DTE.²⁸

15 **Q. How has Consumers explained the basis for its proposed participation goal?**

16 A: Consumers stated the following in its recent rate case filing:

17 *“The principal purpose of this pilot would be test how to drive significant demand*
18 *for cold climate heat pumps and identify and address the market delivery*

²⁷ DTE’s proposed pilot program rebate budget for 2028 is about 22% of its total five-year rebate budget. 22% of its proposed 1800 space heating electrification measures would be about 402 homes.

²⁸ U.S. Energy Information Administration, 2021 Utility Bundled Sales to Ultimate Customers – Residential (Table 6), found at https://www.eia.gov/electricity/sales_revenue_price/.

1 *challenges that will arise when there is such demand. That can only be reasonably*
2 *assessed with a pilot of this scale.”²⁹*

3 Note that Consumers’ proposed pilot, including the proposed scale of 2000 homes over three
4 years, was part of a settlement agreement approved by the Commission in Consumers’ 2022
5 rate case (U-21224).

6 **Q. Would DTE’s proposed pilot program budget need to increase to achieve the levels of**
7 **participation you are proposing?**

8 A. Yes. For one thing, higher rebate levels would likely be required. It will also likely be
9 necessary to more aggressively market the program to contractors and consumers.

10 **C. Lack of Commitment to Ensuring Substantial Low-Income Participation**

11 **Q. Has DTE established any low-income participation goals for its proposed electrification**
12 **pilot program?**

13 A. No.

14 **Q. Has DTE included anything in the design of its proposed program to address the unique**
15 **market barriers to participation by low-income households?**

16 A: The Company stated that it would offer 50% higher rebates for “customers participating in
17 DTE Electric Low-Income Programs”. It is not entirely clear what that means, as DTE does
18 not specify the “DTE Electric Low-Income Programs” to which it is referring. I assume that
19 it means any existing low-income program, including the Company’s energy waste reduction
20 (EWR) programs and bill payment assistance programs.

²⁹ Exhibit No. A-145 (SQM-3) in Case No. U-21389.

1 **Q. Will that bonus rebate be sufficient to ensure robust participation by low-income**
2 **customers?**

3 A: No, at least not for optimal electrification solutions. First, low-income households cannot
4 typically afford any contribution to capital costs for home improvements, whether energy
5 efficiency improvements, electrification investments or other types of investments. This has
6 been a very widely held view – *for decades* – among energy efficiency program practitioners
7 across the country.³⁰ Thus, to the extent that electrification would cost more than the sum of
8 available Inflation Reduction Act (IRA) rebates and DTE rebates, low-income households
9 are highly unlikely to participate. Put another way, low-income participation in DTE’s pilot
10 program will almost certainly be limited to heat pumps whose costs can be 100% covered by
11 a combination of IRA and DTE rebates. At least initially, that is unlikely to be enough to
12 include full electrification with cold climate models. Since it is unclear whether or the extent
13 to which IRA rebates will be available for hybrid fossil fuel furnace/heat pump systems, it
14 may not be sufficient for the vast majority of potential electrification options.

15 Second, as is common for utilities across the country, I would expect that there are significant
16 numbers of low-income households that have not signed up for existing DTE low-income
17 programs. Thus, unless DTE plans to support customers who are eligible for such programs

³⁰ This is why the most recent Michigan energy efficiency potential study assumed that utilities would provide rebates equal to 100% of the cost of efficiency measures for low income customers while offering an average rebate of only 40% of the cost of efficiency upgrades for all other customers [Guidehouse, Michigan Energy Waste Reduction Statewide Efficiency Potential Study (2021-2024), prepared for the Michigan Public Service Commission, September 13, 2021, (https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/workgroups/potential_studies_2021/MI-EWR-Statewide-Potential-Study-Report---Final.pdf?rev=5db96898419c45c78b12205f665858d2&hash=C5E5E698030228F3968619DD4947FFBD)], p. 9.

1 but not currently enrolled in them – and the Company has not addressed this issue in their
2 filing – many low-income households many not even be able access the extra incentives DTE
3 is planning to offer low-income households.

4 **Q. How has Consumers Energy addressed low-income participation in its proposed**
5 **electrification program?**

6 A: Consumers has committed to a goal of low-income participation that is at least proportional
7 to low-income customers’ share of unregulated fuel (principally propane and fuel oil)
8 consumption.³¹

9 **Q. Should DTE be expected to make a similar commitment?**

10 A: Yes. Such a commitment is necessary to ensure that low-income households are not left
11 behind in the energy transition. It is also necessary to ensure that DTE, the Commission and
12 stakeholders learn what is necessary to overcome the unique barriers to electrification that
13 low-income households face. I would expect proportional participation among low-income
14 households would mean that at least 30% of participants would need to be low-income.³²

³¹ Direct testimony of Steven Q. Mclean in Case U-21389, p. 36, lines 22-23.

³² Data from the Kaiser Family Foundation suggest that about 30% of Michigan households have incomes at or below 200% of the federal poverty guideline (<https://www.kff.org/other/state-indicator/population-up-to-200-fpl/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>), the eligibility threshold used for many low income assistance programs including DTE’s low-income EWR programs. The poverty rate for the three northern-most counties in the “thumb” of the state (Huron, Tuscola and Sanilac), which are among the counties with the highest fraction of homes in DTE’s service territory using propane or fuel oil for space heating (34% of homes according to census data reported in the American Community Survey at <https://data.census.gov/mdat/#/>), all have a lower median income level than the state and have a collective poverty rate (at or below 100% of federal poverty guidelines) that is slightly higher than the statewide average (<https://www.census.gov/quickfacts/fact/table/sanilacountymichigan,huroncountymichigan,tuscolacountymichigan,MI/IPE120221>).

1 **Q. How would DTE’s proposed pilot electrification program have to be modified to ensure**
2 **proportional participation by low-income households?**

3 A: First, DTE would have to actively promote the program to income qualified single-family
4 and multi-family households, particularly through community-based organizations that
5 already have relationships with such households and low-income communities, including
6 organizations through which DTE currently promotes its low-income EWR programs.

7 Second, DTE would have to commit to offering a large enough financial incentive – on top
8 of what will be available from IRA rebates – to cover the full cost of new heat pumps for
9 income qualified households. This would require some additional budgetary resources.

10 **D. Not Limiting Rebates to Cold Climate Heat Pumps**

11 **Q. Has DTE specified the minimum efficiency levels it plans to require in order for a**
12 **customer to receive a heat pump rebate under its pilot program?**

13 A: Yes. DTE has stated that it will require all GSHPs and HPWHs to be Energy Star certified.
14 For ASHPs, DTE has suggested that it will require split systems (the most common systems)
15 to have a minimum SEER2 seasonal cooling efficiency rating of 15.2, a minimum EER2
16 peak cooling efficiency rating of 11.7 and a minimum HSPF2 heating efficiency rating of
17 7.8. The current federal Energy Star program has two different ASHP efficiency standards
18 – a cold climate Energy Star standard and a non-cold climate Energy Star standard. DTE’s
19 proposed minimum efficiency requirements for ASHPs are consistent with the non-cold
20 climate Energy Star standard.

1 **Q. Are DTE's proposed minimum efficiency standards reasonable?**

2 A: DTE's proposed minimum efficiency standards for GSHPs and HPWHs are reasonable.
3 However, its proposed efficiency standard for ASHPs is not. DTE should only be promoting
4 heat pumps capable of functioning efficiently in cold climates.

5 **Q. Why should DTE only promote cold climate ASHPs?**

6 A: As discussed in previous sections of my testimony, the decarbonization of Michigan's
7 buildings is going to require massive amounts of electrification, in part because of the very
8 limited availability and very high cost of low carbon biofuels.³³ As also previously discussed,
9 the State has established a goal of reducing emissions from buildings by 17% by 2030. That
10 goals likely cannot be met without significant levels of electrification. Thus, there should be
11 a premium put on maximizing the amount of fossil fuel use that heat pumps displace. Put
12 another way, an important opportunity is lost whenever a heat pump that reduces fossil fuel
13 use by only 60-70% is installed instead of one that could have achieved greater annual energy
14 bill savings by displacing 90-100% of fossil fuel.

15 It is also critically important to note that the heat pump market in DTE's service territory is
16 very small. Part of the purpose of DTE's pilot should be to grow the market, in part by

³³ For example, the renewable natural gas (RNG) study commissioned last year by the Michigan Public Service Commission concluded that the annual amount of RNG that could become available in the state by 2050 was between only 8.5% and 22.0% of current average annual fossil gas consumption from residential, commercial, and industrial customers in the state (ICF, Michigan Renewable Natural Gas Study, September 23, 2022, <https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/workgroups/RenewableNaturalGas/MI-RNG-Study-Final-Report-9-23-22.pdf?rev=213e31ab46c24ce1b799eeb8a42f0824&hash=5B8C2CEB98C8F8F20C7D65F4C4153CE1>). And that is despite a number of optimistic assumptions. The same study estimated that some of the state's RNG resource potential would cost in excess of \$40 per MMBtu – or an order of magnitude or more greater than the Henry Hub spot market price for fossil gas this past winter (<https://www.eia.gov/dnav/ng/hist/rngwhhdm.htm>).

1 raising awareness and familiarity and comfort with heat pump alternatives among both
2 HVAC contractors and customers. If the pilot conditions contractors and customers to think
3 of non-cold climate models as appropriate, those perceptions will be very difficult to change
4 later. Put simply, it makes no sense to establish efficiency norms that are lower than levels
5 efficiency that are optimal in the long run.

6 **Q. All heat pumps, including cold climate models, become less efficient as the outdoor**
7 **temperature drops. Does a cold climate ASHP still produce heat less expensively than**
8 **a propane furnace even when it is very cold outside?**

9 A: Yes. Cold climate heat pumps are required to produce heat with a coefficient of performance
10 (COP) of at least 1.75 at 5 degrees Fahrenheit (their average winter season efficiency ranges
11 from a COP of 2.5 to 3.0 or higher). Even at that lower level of efficiency at 5 degrees, the
12 cost of producing heat with a cold climate ASHP is still nearly 30% less than the cost of
13 producing heat with a propane furnace.³⁴

14 **Q. Can cold climate ASHPs be part of hybrid heating solutions that include both a heat**
15 **pump and a propane or fuel oil furnace?**

16 A: Yes. In fact, the hybrid electrification decarbonization pathway preferred by the
17 Massachusetts gas utilities assumed all hybrid systems would include cold climate heat
18 pumps.

³⁴ Calculated using DTE's assumptions regarding the average 2022 price of propane (\$2.53/gallon), average cost of electricity for an ASHP (\$0.1476), and average propane furnace efficiency (86%) – all from Response to MNSCDE-5.5b – and a cold climate heat pump COP of 1.75 at 5° F. Note many cold climate heat pumps have COPs that are better than 1.75 at 5° F.

1 **Q. Is Consumers Energy’s proposed electrification pilot program limiting promotion of**
2 **ASHPs to cold climate models?**

3 A: Yes.³⁵

4 **Q. What has DTE said about why it is not proposing to limit its ASHP rebates to cold**
5 **climate models?**

6 A: DTE states that the reason it is not planning to limit ASHP rebates to cold climate models is
7 to “best match the Inflation Reduction Act (IRA) rebates and tax credits, which also do not
8 have a cold climate designation requirement.”³⁶ The Company also suggests that “unique
9 attributes of a home may require solutions beyond only cold climate heat pumps to most
10 appropriately offset delivered fuel consumption.”³⁷

11 **Q. Is that a reasonable explanation?**

12 A: No. First, by statute, to earn an IRA tax credit one must install a heat pump that meets the
13 Consortium for Energy Efficiency’s highest efficiency tier. For 2023, that includes an
14 HSPF2 rating of at least 8.1, a minimum COP rating of 1.75 at 5 degrees Fahrenheit, and a
15 minimum capacity to deliver heat at 17 degrees Fahrenheit.³⁸ The first two of those
16 requirements are consistent with the cold climate Energy Star standard; the third is analogous
17 to but slightly little less stringent than the cold climate Energy Star standard. All three of
18 those requirements of them are more stringent than DTE is proposing to require. Moreover,
19 those standards may become stricter in 2024 and subsequent years. In other words, many

³⁵ Case No. U-21389, Direct testimony of Steven Q. Mclean, p. 36, line 21.

³⁶ Ex MEC-8, Response to MNSCDE-5.3b.

³⁷ Ibid.

³⁸ <https://ceel.my.site.com/s/resources?id=a0V2R00000sUQd1UAG>.

1 ASHPs that meet DTE's proposed standard would actually not qualify for an IRA tax credit.
2 In addition, it is not yet clear whether the IRA rebates will require that equipment meet the
3 Energy Star cold climate efficiency ratings.

4 Second, even if IRA rebates and tax credits do not adopt minimum efficiency requirements
5 identical to the cold climate Energy Star specification, DTE could and should do so.
6 Adopting a standard less stringent than IRA standards (as the discussion above regarding the
7 IRA tax credit requirements shows DTE is actually proposing to do) would be problematic
8 because DTE would not be able to leverage federal funding for some of its rebates. However,
9 adopting a standard that is a little more stringent would not be problematic because it would
10 essentially be offering customers a bonus rebate for installing the best equipment.

11 Third, I do not understand the argument that unique attributes of some homes may necessitate
12 use of less efficient heat pumps. The Company has not made clear what those attributes
13 would be. Moreover, even if there are unusual cases where it is not physically possible or
14 reasonable to install a cold climate ASHP, the program requirements should not be built
15 around exceptions. Doing so has the effect of watering down standards in ways not necessary
16 for the vast majority of the market. Unusual cases can either be excluded from the pilot or,
17 alternatively, treated as exceptions on a custom basis.

18 **Q. What if the additional energy bill savings from a cold climate ASHP do not offset the**
19 **cost differential between a cold climate ASHP and a non-cold climate model?**

20 A: If the heat pump market in DTE's service territory was well-developed and the costs of
21 greenhouse gas emissions had been internalized in the price of fossil fuels, then it may be
22 appropriate to consider whether the added cost of a cold climate ASHP was worth the added
23 benefit of increased efficiency and energy bill savings. However, neither of those things are

1 true today. In particular, the cost of cold climate heat pumps – and their incremental cost
2 relative to non-cold climate models – is likely to come down as demand increases, there is
3 more competition and economies of scale begin to be realized. Basing decisions on which
4 products to promote on current product prices and without consideration of longer-term
5 policy goals is misguided.

6 E. Lack of a Plan for Integrating Electrification with Energy Efficiency

7 **Q. What has DTE said about how it will address the opportunities for promoting**
8 **improvements to building envelop efficiency (i.e., increased insulation and air leakage**
9 **reduction) in the homes of customers who participate in its electrification pilot?**

10 A: DTE said nothing in its direct evidence in this proceeding about how it plans to promote
11 energy efficiency to pilot program participants. In response to discovery questions, it said
12 that it is not planning to require certain levels of efficiency to qualify for a heat pump rebate³⁹
13 and that it “plans to leverage the existing EWR programs to educate customers on the benefits
14 of building envelope efficiency, insulation and reducing air leakage.”⁴⁰

15 **Q. Is that a reasonable response?**

16 A: I am concerned that the Company appears to be treating energy efficiency as an afterthought
17 as it relates to its pilot electrification program. There are a number of benefits of integrating
18 building envelope efficiency and electrification. For example, the ability of heat pumps to
19 meet the heating load of a home is enhanced if the home is relatively efficient. Customers
20 are also more likely to be satisfied with the performance of a heat pump if their home is

³⁹ Ex MEC-8, Response to MNSCDE-5.3d.

⁴⁰ Ex MEC-8, Response to MNSCDE-5.3e.

1 efficient. They will also increase energy bill savings if they take advantage of opportunities
2 to reduce air leakage and/or increase insulation levels. Of course, the impacts of
3 electrification on the grid are also minimized if the home is efficient. Thus, while I do not
4 take issue with DTE’s decision to not require a certain level of energy efficiency in order to
5 qualify for a heat pump rebate, I think the Company should be planning to do more to
6 promote efficiency in homes that take such rebates than just referring them to the Company’s
7 EWR programs.

8 **Q. What would you have liked to see DTE include in its pilot program plan regarding**
9 **building envelope efficiency?**

10 A: Several things. The first would be the offer of a free, professional building efficiency audit.
11 Second, any income qualified participant should be immediately made aware of availability
12 of building envelope efficiency upgrades that are available for free or discounted through the
13 state/federal low-income weatherization program as well as any DTE EWR programs. The
14 Company should assist customers in accessing those programs. Third, the Company should
15 offer bonus rebates – i.e., dollars over and above what are available through its EWR
16 programs –to non-low-income households that electrify their space heating.

17 **F. Insufficient Level of Future Stakeholder Collaboration**

18 **Q. What has DTE proposed with respect to collaborating with stakeholders on the design,**
19 **roll-out and implementation of its pilot electrification program?**

20 A: The Company has proposed to create a stakeholder group that would meet annually “to
21 discuss program progress and potential modifications.”

1 **Q. Do you support that proposal?**

2 A: I strongly support the concept of a stakeholder group. However, the proposal to limit
3 engagement with stakeholders to once a year will unnecessarily limit the value of the
4 engagement. Annual meetings inevitably take the form of the utility presenting what has been
5 done and plans for the future rather than facilitating a real exchange of ideas. A process with
6 monthly meetings while the details of the pilot are being fleshed out and for the first three
7 months of implementation, then transitioning to quarterly meetings, would be much more
8 collaborative and would enable the Company to fully leverage the expertise and experience
9 with similar efforts in other jurisdictions that some interested stakeholders could bring to this
10 effort.

11 Also, it will be important for DTE to endeavor to include key stakeholder constituencies in
12 any group discussing this program. That should include community-based organizations,
13 low-income advocacy organizations, environmental groups and affordable housing groups.

1 **VI. RECOMMENDATIONS**

2 **Q: What are you recommending for this proceeding?**

3 A: My recommendations are as follows:

- 4 1. DTE's proposed 2024 pilot program to electrify homes currently using propane, oil,
5 and/or other fossil fuels for heating or water heating should be approved with several
6 conditions. This will allow the program to get started quickly while work is proceeding
7 to revise the program design for subsequent years. The conditions for the 2024 program
8 approval should be:
- 9 a. The only ASHPs the Company can promote are those meeting the cold climate
10 Energy Star specification.
- 11 b. The Company should attempt to maximize ASHP participation in 2024, through
12 increases in ASHP rebate levels, enhanced marketing and/or other means.
- 13 c. The Company should endeavor to achieve substantial participation by low
14 income customers.
- 15 d. The rebate portion of the budget should be doubled in order to accommodate
16 additional participation and targeting of low income households.
- 17 2. DTE's should work with MNSC, Commission Staff and other interested stakeholders
18 in revising plans for the pilot for 2025 and 2026. DTE should file the revised pilot
19 program design, goals and budget with the MPSC no later than March 31, 2024 (or
20 earlier if necessary to gain approval prior to launching the revised program in January
21 2025). The proposal could be part of a future rate case (if the Company makes a new
22 rate case proposal within the required timeframe) or a stand-alone proposal. The
23 Company's proposal should be consistent with the following design principles:

- 1 a. The principal goal of this pilot would be to test how to drive significant demand
2 for cold climate heat pumps and identify and address the market delivery
3 challenges what will arise when there is such demand.
- 4 b. To that end, the pilot should have a goal of electrifying space heating in at least
5 3,000 homes by the end of 2026.
- 6 c. There should be a commitment to ensuring that at least 33% of the electrified
7 homes are low-income. It is important that low-income electrification
8 challenges be identified and that low-income customers are not left behind as
9 electrification proceeds, since they benefit most from the lowering of heating
10 costs and are least able to afford the upfront investments needed to lower costs.
- 11 d. To facilitate low-income participation, there should be a commitment to pay
12 100% of the incremental cost (i.e., costs beyond those covered by IRA rebates)
13 of electrification measures for low-income participants.
- 14 e. The program should simultaneously emphasize the importance and value of
15 building envelope efficiency improvements – and support participant
16 investments in such improvements as they are being electrified (or soon
17 thereafter). At a minimum, this should include the offer of a free professional
18 energy audit of each participating homes, helping low-income participants
19 access free efficiency upgrades through the state/federal weatherization
20 program and DTE EWR programs, and providing bonus rebates for
21 weatherization measures installed by non-low-income participants.

22 **Q: Does that conclude your testimony?**

23 **A:** Yes, it does.

Chris Neme Principal



Professional Summary

Chris specializes in analysis of markets for energy efficiency, demand response, renewable energy and strategic electrification measures, as well as the design and evaluation of programs and policies to promote them. During his 25+ years in the industry, he has worked for energy regulators, utilities, government agencies and advocacy organizations in 30+ states, 7 Canadian provinces and several European countries. He has filed expert witness testimony in 60+ cases before regulatory commissions in 13 different jurisdictions; he has also testified before several state legislatures. Chris has authored numerous reports and papers on clean energy policies and programs, including the National Standard Practice Manual for Benefit Cost Analysis of Distributed Energy Resources (2020), the predecessor NSPM for energy efficiency (2017), and several reports on electric non-wires and gas non-pipe alternatives.

Experience

2010-present: Principal, Energy Futures Group, Hinesburg, VT

1999-2010: Director of Planning & Evaluation, Vermont Energy Investment Corp., Burlington, VT

1993-1999: Senior Analyst, Vermont Energy Investment Corp., Burlington, VT

1992-1993: Energy Consultant, Lawrence Berkeley National Laboratory, Gaborone, Botswana

1986-1991: Senior Policy Analyst, Center for Clean Air Policy, Washington, DC

Education

M.P.P., University of Michigan, 1986

B.A., Political Science, University of Michigan, 1985

Selected Projects

- **Natural Resources Defense Council (Illinois, Michigan and Ohio).** Critically review efficiency, demand response, electrification, distribution system investment and integrated resource plans filed by IL, MI and OH utilities. Draft/defend regulatory testimony on critiques. Represent NRDC in regular stakeholder-utility engagement processes. Represent NRDC in collaborative development of non-wires solution pilots. Support development of Illinois clean energy legislation. (2010 to present)
- **E4TheFuture.** Co-authored National Standard Practice Manual Benefit Cost-Analysis of Distributed Energy Resources (2020) and NSPM for efficiency (2017). Present the NSPM to audiences across the U.S. and Canada; helping several to assess how to use it to refine current practices. (2016-present)
- **Vermont Agency of Natural Resources.** Supported EFG/Cadmus team in analysis of pathways for achieving the state's Global Warming Solutions Action emission reduction requirements, including marginal abatement cost curve development (2022). Supporting new assessment of emissions and cost tradeoffs between policy options for decarbonizing buildings and industry sectors (2023).

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- **Connecticut Energy Efficiency Board.** Part of team providing on-going review and input on utility efficiency program planning and related policy issues. Lead role in providing input on New England Avoided Energy Supply Cost study and cost-effectiveness screening policy issues. (2019-present)
- **Ontario Energy Board.** Appointed to serve on provincial gas DSM Evaluation Advisory Committee, providing input on multi-year evaluation plans, scopes of work for evaluation studies and independent evaluator assessments of utilities' annual gas savings claims. Also serve on gas IRP committee, providing input on non-pipe alternatives, including cost-effectiveness analyses and selection of pilot projects. Previously also appointed to advisory committees on gas and electric efficiency potential studies and advisory committee on carbon price forecast studies. (2015-present)
- **Green Energy Coalition (Ontario).** Represent coalition of environmental groups in regulatory proceedings, utility negotiations and stakeholder meetings on DSM policies, utility proposed DSM Plans, integrated resource planning and rules governing non-pipe alternatives. (1993 to present)
- **Energy Action Network (Vermont).** Co-authored a white paper on the concept of a "Clean Heat Standard" – a kind of renewable portfolio standard that would impose increasing obligations on Vermont Gas and wholesale suppliers of fuel oil and propane to reduce greenhouse gas emissions from burning of fossil fuels in homes and businesses, consistent with the state's Global Warming Solutions Act requirements (e.g., 40% reduction by 2030). Co-leading related voluntary working group of interested parties providing input on the design of the policy. Testified before Vermont House Energy and Technology Committee on Clean Heat Standard legislation. (2020-present)
- **Sierra Club (Massachusetts).** Supported Sierra Club's participation in an year-long process in which the Massachusetts' gas utilities engaged with stakeholders to discuss and consider the future of the gas industry in the context of decarbonization policy goals. Reviewed draft inputs to technical study of options for decarbonizing the gas industry presented to the group and assisted in drafting regulatory comments on final study results as well as gas utility policy proposals. (2021-2022).
- **Environmental Law and Policy Center.** Filed expert witness testimony supporting AEP Ohio's initial proposal to run a portfolio of efficiency programs and in opposition to a proposed rate case settlement agreement to eliminate such programs. (2021)
- **Sierra Club (Maryland).** Provided strategic support on testimony on cost-effectiveness and other rules governing expansion of gas infrastructure to connect additional customers. (2021)
- **New Jersey Board of Public Utilities.** Served on management team responsible for statewide delivery of New Jersey Clean Energy Programs. Led strategic planning; support regulatory filings, cost-effectiveness analysis & evaluation work. (2015 to 2020). Served on management team for start-up of residential and renewables programs for predecessor project. (2006-2010)
- **Regulatory Assistance Project - U.S.** Provided guidance on efficiency policy and programs. Lead author on strategic reports on program options for decarbonizing Vermont buildings, achieving 30% electricity savings in 10 years, using efficiency to defer T&D system investments, & bidding efficiency into capacity markets. (2010 to 2020)
- **Energy Efficiency Alberta.** Assisted EEA in providing input to Alberta Utilities Commission on the role efficiency resources can play in reducing electric system costs. (2019 to 2020)

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- **Consumers Association of Canada (Manitoba) and Winnipeg Harvest.** Critically reviewed and filed regulatory testimony on Efficiency Manitoba's first three-year plan (2020-2023), with particular emphasis on the extent to which the plan supported advanced heat pump technology as both an electric efficiency measure and a key to future building electrification. (2019-2020).
- **Citizens Action Coalition of Indiana.** Critically reviewed how energy efficiency resources were modeled in utility IRPs, as well as the design of energy efficiency program portfolios. (2018 to 2020)
- **Efficiency Vermont.** Provided technical support in review of avoided cost assumptions, as well as related policies on cost-effectiveness analyses of efficiency resources (2019).
- **Earth Justice and Southern Alliance for Clean Energy.** Helped critically review Florida utilities' efficiency potential studies and proposed 2020-2024 energy efficiency savings targets. (2019)
- **New Hampshire Office of the Consumer Advocate.** Drafted expert witness testimony on the merits of utilities adding a pilot non-wires solution project to their efficiency program plans. (2018)
- **Regulatory Assistance Project - Europe.** Provide on-going support on efficiency policies and programs in the United Kingdom, Germany, and other countries. Reviewed draft European Union policies on Energy Savings Obligations, EM&V protocols, and related issues. Drafted policy brief on efficiency feed-in-tariffs and roadmap for residential retrofits. (2009 to 2018)
- **Green Mountain Power (Vermont).** Supported development and implementation of GMP's first compliance plan for Vermont RPS Tier 3 requirement to reduce customers' direct consumption of fossil fuels, with significant emphasis on strategic electrification strategies. Also developed 10-year forecast of sales that could result from three different levels of policy/program promotion of residential electric space heating, electric water heating and electric vehicles. (2016 to 2018)
- **Alberta Energy Efficiency Alliance.** Drafted white paper how treatment of "efficiency as a resource" could be institutionalized in Alberta. The paper followed several presentations to government agencies and others on behalf of the Pembina Institute. (2017 to 2018)
- **Southern Environmental Law Center.** Assessed reasonableness of Duke Energy's historic efficiency program savings claims, as well as the design of their efficiency program portfolios for 2019. Filed expert witness testimony on findings in North Carolina dockets (2018).
- **Toronto Atmospheric Fund.** Helped draft an assessment of efficiency potential from retrofitting of cold climate heat pumps into electrically heated multi-family buildings (2017).
- **Northeast Energy Efficiency Partnerships.** Helped manage Regional EM&V forum project estimating savings for emerging technologies, including field study of cold climate heat pumps. Led assessment of best practices on use of efficiency to defer T&D investment. (2009 to 2015)
- **Ontario Power Authority.** Managed jurisdictional scans on leveraging building efficiency labeling/disclosure requirements and non-energy benefits in cost-effectiveness screening. Supported staff workshop on the role efficiency can play in deferring T&D investments. Presented on efficiency trends for Advisory Council on Energy Efficiency. (2012-2015)
- **Vermont Public Interest Research Group.** Conducted comparative analysis of the economic and environmental impacts of fuel-switching from oil/propane heating to either natural gas or efficient, cold climate electric heat pumps. Filed regulatory testimony on findings. (2014-2015)

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- **New Hampshire Electric Co-op.** Led assessment of the co-op's environmental and social responsibility programs' promotion of whole building efficiency retrofits, cold climate heat pumps and renewable energy systems. Presented recommendations to the co-op Board. (2014)
- **National Association of Regulatory Utility Commissioners (NARUC).** Assessed alternatives to 1st year savings goals to eliminate disincentives to invest in longer-lived savings. (2013)
- **California Investor-Owned Utility.** Senior advisor on EFG project to analyze 10 leading U.S. utility portfolios to determine if there are differences in the cost of saved energy related to utility spending in specific non-incentive categories, including administration, marketing, and EM&V. (2013)
- **DC Department of the Environment (Washington DC).** Part of VEIC team administering the DC Sustainable Energy Utility (SEU). Helped characterize the DC efficiency market and supporting the design of efficiency programs that the SEU will be implementing. (2011 to 2012)
- **Ohio Sierra Club.** Filed and defended expert witness testimony on the implications of not fully bidding all efficiency resources into the PJM capacity market. (2012)
- **Regulatory Assistance Project – Global.** Assisted RAP in framing several global research reports. Co-authored the first report – an extensive “best practices guide” on government policies for achieving energy efficiency objectives, drawing on experience with a variety of policy mechanism employed around the world. (2011)
- **Tennessee Valley Authority.** Assisted CSG team providing input to TVA on the redesign of its residential efficiency program portfolio to meet aggressive new five-year savings goals. (2010)
- **New York State Energy Research and Development Authority (NYSERDA).** Led residential & renewables portions of several statewide efficiency potential studies. (2001 to 2010)
- **Ohio Public Utilities Commission.** Senior Advisor to a project to develop a web-based Technical Reference Manual (TRM). The TRM includes deemed savings assumptions, deemed calculated savings algorithms and custom savings protocols. It was designed to serve as the basis for all electric and gas efficiency program savings claims in the state. (2009 to 2010)
- **Vermont Electric Power Company.** Led residential portion of efficiency potential study to assess alternatives to new transmission line. Testified before Public Service Board. (2001-2003)
- **Efficiency Vermont.** Served on Sr. Management team. Supported initial project start-up. Oversaw residential planning, input to regulators on evaluation, input to regional EM&V forum, development of M&V plan and other aspects of bidding efficiency into New England's Forward Capacity Market (FCM), and development and updating of nation's first TRM. (2000 to 2010)
- **Long Island Power Authority Clean Energy Plan.** Led team that designed the four major residential programs (three efficiency, one PV) incorporated into the plan in 1999. Oversaw extensive technical support to the implementation of those programs. This involved assistance with the development of goals and budgets, development of savings algorithms, cost-effectiveness screening, and on-going program design refinements. (1998 to 2009)

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Selected Publications and Reports

- *Cost Savings and CO2 Emission Reductions of Residential Electrification in Peoples Gas Territory*, prepared for the Natural Resources Defense Council, November 2022 (with David Hill & Liz Bourguet)
- *Tip of the Spear: How Efficiency Programs Supporting Cold Climate Heat Pumps in Low Income Multi-Family Buildings Could Help Lay the Foundation for Building Decarbonization in Michigan and Illinois*, 2022 ACEEE Summer Study on Energy Efficiency in Buildings (with Laura Goldberg, Valeria Rincon and Samantha Williams)
- *The Clean Heat Standard*, Vermont Energy Action Network (EAN) White Paper, December 2021 (with Richard Cowart)
- *National Standard Practice Manual for Benefit Cost Analysis of Distributed Energy Resources*, August 2020, (with Tim Woolf and others)
- *Reducing CO₂ Emissions from Vermont Buildings: Potential and Cost-Effectiveness of Select Program Options*, Regulatory Assistance Project, February 13, 2019 (with Richard Faesy)
- *Pumping Energy Savings: Recommendations for Accelerating Heat Pump Adoption in Ontario's Electrically Heated Multi-Residential Buildings*, Toronto Atmospheric Fund, July 2018 (with Devon Calder, Brian Purcell and Judy Simon)
- *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*, Edition 1, Spring 2017 (with Tim Woolf, Marty Kushler, Steven Schiller and Tom Eckman)
- *The Next Quantum Leap in Efficiency: 30% Electricity Savings in 10 Years*, Proceedings of the 2016 ACEEE Summer Study on Energy Efficiency in Buildings, Volume 9, pp. 1-14 (with Jim Grevatt, Rich Sedano and Dave Farnsworth)
- *The Next Quantum Leap in Efficiency: 30% Electricity Savings in Ten Years*, published by the Regulatory Assistance Project, February 2016 (with Jim Grevatt)
- *Energy Efficiency as a T&D Resource: Lessons from Recent U.S. Efforts to Use Geographically Targeted Efficiency Programs to Defer T&D Investments*, published by Northeast Energy Efficiency Partnerships, January 9, 2015 (with Jim Grevatt)
- *Unleashing Energy Efficiency: The Best Way to Comply with EPA's Clean Power Plan*, Public Utilities Fortnightly, October 2014, pp. 30-38 (with Tim Woolf, Erin Malone and Robin LeBaron)
- *The Resource Value Framework: Reforming Energy Efficiency Cost-Effectiveness Screening*, published by the National Efficiency Screening Project, August 2014 (with Tim Woolf et al.)
- *U.S. Experience with Participation of Energy Efficiency in Electric Capacity Markets*, Regulatory Assistance Project, August 2014 (with Richard Cowart)
- *The Positive Effects of Energy Efficiency on the German Electricity Sector*, IEPEC 2014 Conference, September 2014 (with Friedrich Seefeldt et al.)

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- *Final Report: Alternative Michigan Energy Savings Goals to Promote Longer Term Savings and Address Small Utility Challenges*, prepared for the Michigan Public Service Commission, September 13, 2013 (with Optimal Energy)
- *Energy Efficiency Feed-in-Tariffs: Key Policy and Design Considerations*, Proceedings of ECEEE 2013 Summer Study, pp 305-315 (with Richard Cowart)
- *Can Competition Accelerate Energy Savings? Options and Challenges for Efficiency Feed-in-Tariffs*, published in *Energy & Environment*, Volume 24, No. 1-2, February 2013 (with Richard Cowart)
- *An Energy Efficiency Feed-in-Tariff: Key Policy and Design Considerations*, published by the Regulatory Assistance Project, March/April 2012 (with Richard Cowart)
- *U.S. Experience with Efficiency as a Transmission and Distribution System Resource*, published by the Regulatory Assistance Project, February 2012 (with Rich Sedano)
- *Achieving Energy Efficiency: A Global Best Practices Guide on Government Policies*, published by the Regulatory Assistance Project, February 2012 (with Nancy Wasserman)
- *Residential Efficiency Retrofits: A Roadmap for the Future*, published by the Regulatory Assistance Project, May 2011 (with Meg Gottstein and Blair Hamilton)
- *Is it Time to Ditch the TRC?* Proceedings of ACEEE 2010 Summer Study on Energy Efficiency in Buildings, Volume 5 (with Marty Kushler)
- *Energy Efficiency as a Resource in the ISO New England Forward Capacity Market*, in *Energy Efficiency*, published on line 06 June 2010 (with Cheryl Jenkins and Shawn Enterline)
- *A Comparison of Energy Efficiency Programmes for Existing Homes in Eleven Countries*, prepared for the British Department of Energy and Climate Change, 19 February, 2010 (with Blair Hamilton et al.)
- *Energy Efficiency as a Resource in the ISO New England Forward Capacity Market*, Proceedings of the 2009 European Council on an Energy Efficient Economy Summer Study, pp. 175-183 (with Cheryl Jenkins and Shawn Enterline)
- *Playing with the Big Boys: Energy Efficiency as a Resource in the ISO New England Forward Capacity Market*, Proceedings of ACEEE 2008 Summer Study Conference on Energy Efficiency in Buildings, Volume 5 (with Cheryl Jenkins and Blair Hamilton)
- *Recommendations for Community-Based Energy Program Strategies, Final Report*, developed for the Energy Trust of Oregon, June 1, 2005 (with Dave Hewitt et al.)
- *Shareholder Incentives for Gas DSM: Experience with One Canadian Utility*, Proceedings of ACEEE 2004 Summer Study on Energy Efficiency in Buildings, Volume 5 (with Kai Millyard)
- *Cost Effective Contributions to New York's Greenhouse Gas Emission Reduction Targets from Energy Efficiency and Renewable Energy Resources*, ACEEE 2004 Summer Study Proceedings, Volume 8 (with David Hill et al.)
- *Opportunities for Accelerated Electric Energy Efficiency Potential in Quebec: 2005-2012*, prepared for Regroupement national des conseils regionaux de l'environnement du Quebec, Regroupement des organismes environnementaux energie and Regroupement pour la

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- responsabilite sociale des entreprises, May 16, 2004 (with Eric Belliveau, John Plunkett and Phil Dunsky)
- *Review of Connecticut's Conservation and Load Management Administrator Performance, Plans and Incentives*, for Connecticut Office of Consumer Counsel, October 31, 2003 (with John Plunkett, Phil Mosenthal, Stuart Slote, Francis Wyatt, Bill Kallock and Paul Horowitz)
 - *Energy Efficiency and Renewable Energy Resource Development Potential in New York State*, for New York Energy Research and Development Authority, August 2003 (with John Plunkett, Phil Mosenthal, Stave Nadel, Neal Elliott, David Hill and Christine Donovan)
 - *Assessment of Economically Deliverable Transmission Capacity from Targeted Energy Efficiency Investments in the Inner and Metro-Area and Northwest and Northwest/Central Load Zones", for Vermont Electric Power Company, Final Report: April 2003* (with John Plunkett et al.)
 - *Residential HVAC Quality Installation: New Partnership Opportunities and Approaches*, Proceedings of ACEEE 2002 Summer Study Conference on Energy Efficiency in Buildings, Volume 6 (with Rebecca Foster, Mia South, George Edgar and Put Murphy)
 - *A Modified Delphi Approach to Predict Market Transformation Program Effects*, Proceedings of ACEEE 2000 Summer Study Conference on Energy Efficiency in Buildings, Volume 6 (with Phil Mosenthal et al.)
 - *Using Targeted Energy Efficiency Programs to Reduce Peak Electrical Demand and Address Electric System Reliability Problems*, published by the American Council for an Energy Efficient Economy, November 2000 (with Steve Nadel and Fred Gordon)
 - *Energy Savings Potential from Addressing Residential Air Conditioner and Heat Pump Installation Problems*, American Council for an Energy Efficient Economy, February 1999 (with John Proctor and Steve Nadel)
 - *Promoting High Efficiency Residential HVAC Equipment: Lessons Learned from Leading Utility Programs*, Proceedings of ACEEE 1998 Summer Study Conference on Energy Efficiency in Buildings, Volume 2 (with Jane Peters and Denise Rouleau)
 - *PowerSaver Home Program Impact Evaluation*, report to Potomac Edison, February 1998 (with Andy Shapiro, Ken Tohinaka and Karl Goetze)
 - *A Tale of Two States: Detailed Characterization of Residential New Construction Practices in Vermont and Iowa*, Proceedings of ACEEE 1996 Summer Study Conference on Energy Efficiency in Buildings, Volume 2 (with Blair Hamilton, Paul Erickson, Peter Lind and Todd Presson)
 - *New Smart Protocols to Avoid Lost Opportunities and Maximize Impact of Residential Retrofit Programs*, in Proceedings of ACEEE 1994 Summer Study on Energy Efficiency in Buildings (with Blair Hamilton and Ken Tohinaka)
 - *Economic Analysis of Woodchip Systems and Finding Capital to Pay for a Woodchip Heating System*, Chapters 6 and 8 in *Woodchip Heating Systems: A Guide for Institutional and Commercial Biomass Installations*, published by the Council of Northeastern Governors, July 1994

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- *PSE&G Lost Opportunities Study: Current Residential Programs and Relationship to Lost Opportunities*, prepared for the PSE&G DSM Collaborative, June 1994 (with Blair Hamilton, Paul Berkowitz and Wayne DeForest)
- *PSE&G Lost Opportunities Study: Preliminary Residential Market Analysis*, prepared for the PSE&G DSM Collaborative, May 1994 (with Blair Hamilton, Paul Berkowitz and Wayne DeForest)
- *Long-Range Evaluation Plan for the Vermont Weatherization Assistance Program*, prepared for the Vermont Office of Economic Opportunity, February 1994 (with Blair Hamilton and Ken Tohinaka)
- *Impact Evaluation of the 1992-1993 Vermont Weatherization Assistance Program*, prepared for the Vermont Office of Economic Opportunity, December 1993 (with Blair Hamilton and Ken Tohinaka)
- *Electric Utilities and Long-Range Transport of Mercury and Other Toxic Air Pollutants*, published by the Center for Clean Air Policy, 1991
- *Coal and Emerging Energy and Environmental Policy*, in Natural Resources and Environment, 1991 (with Don Crane)
- *Acid Rain: The Problem*, in EPA Journal, January/February 1991 (with Ned Helme)
- *An Efficient Approach to Reducing Acid Rain: The Environmental Benefits of Energy Conservation*, published by the Center for Clean Air Policy, 1989
- *The Untold Story: The Silver Lining for West Virginia in Acid Rain Control*, published by the Center for Clean Air Policy, 1988
- *Midwest Coal by Wire: Addressing Regional Energy and Acid Rain Problems*, published by the Center for Clean Air Policy, 1987
- *Acid Rain: Road to a Middle Ground Solution*, published by the Center for Clean Air Policy, 1987 (with Ned Helme)

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MPSC Case No: U-21297

Requester: MNSC

Question No.: MNSCDE-5.3b

Respondent: K. Peterson

Page: 1 of 1

Question: Regarding direct testimony of Kelsey Peterson, p. 78, line 20 through p. 79, line 21: DTE summarizes the rebates that will be made available for ASHPs, GHSPs and HPWHs – for both contractors and customers.

b. Is DTE planning to require that ASHPs be “cold climate” models, defined either by achieving the federal Energy Star cold climate heat pump designation or the Northeast Energy Efficiency Partnerships’ cold climate ASHP product listing (https://ashp.neep.org/#!/product_list/). If so, please specify which designation will be required. If not, please explain why DTE will not be limiting rebates for ASHPs to cold climate models.

Answer: DTE Electric does not plan to limit rebates for ASHPs to cold climate models only in order to best match the Inflation Reduction Act (IRA) rebates and tax credits, which also do not have a cold climate designation requirement. Unique attributes of a home may require solutions beyond only cold climate heat pumps to most appropriately offset delivered fuel consumption.

Attachment: None

MPSC Case No: U-21297

Requester: MNSC

Question No.: MNSCDE-5.3d

Respondent: K. Peterson

Page: 1 of 1

Question: Regarding direct testimony of Kelsey Peterson, p. 78, line 20 through p. 79, line 21: DTE summarizes the rebates that will be made available for ASHPs, GHSPs and HPWHs – for both contractors and customers.

d. DTE did not make reference to any potential requirements regarding the efficiency of homes into which ASHPs or GSHPs would be installed. Please clarify whether there will be any requirements – whether minimum insulation levels, minimum home efficiency scores or even just a requirement to get a building envelop efficiency assessment or audit.

Answer: DTE Electric is not planning to require certain levels of home efficiency to qualify for a rebate.

Attachment: None

MPSC Case No: U-21297

Requester: MNSC

Question No.: MNSCDE-5.3e

Respondent: K. Peterson

Page: 1 of 1

Question: Regarding direct testimony of Kelsey Peterson, p. 78, line 20 through p. 79, line 21: DTE summarizes the rebates that will be made available for ASHPs, GHSPs and HPWHs – for both contractors and customers.

e. Even if there are no efficiency requirements, what – if anything – will DTE do to educate customers of the benefits of building envelop efficiency improvements and/or promote upgrading of insulation levels or reductions of air leakage through the pilot program. In responding, please be clear about whether it will be more than just referring customers to the Company's EWR programs.

Answer: DTE Electric plans to leverage the existing EWR programs to educate customers on the benefits of building envelope efficiency, insulation, and reducing air leakage.

Attachment: None

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 rules governing the distribution and supply of electric energy, and for miscellaneous accounting authority. U-21297

PROOF OF SERVICE

On the date below, an electronic copy of **Direct Testimony and Exhibits of Chris Neme on behalf of Michigan Environmental Council, Natural Resources Defense Council, Sierra Club, and Citizens Utility Board of Michigan (Exhibit MEC-7 through MEC-8)** was served on the following:

Name/Party	E-mail Address
Administrative Law Judge Hon. Sharon Feldman	feldmans@michigan.gov
DTE Electric Company Jon P. Christinidis Paula Johnson-Bacon Andrea E. Hayden	mpscfilings@dteenergy.com jon.christindis@dteenergy.com paula.bacon@dteenergy.com andrea.hayden@dteenergy.com
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Soulardarity & We Want Green, Too Mark Templeton Amanda Urban	Aelc_mpsc@lawclinic.uchicago.edu templeton@uchicago.edu t-9aurba@lawclinic.uchicago.edu
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Utility Workers Union of America, Local 223 Benjamin L. King	bking@michworkerlaw.com

[signature page to follow]

The statements above are true to the best of my knowledge, information, and belief.

OLSON, BZDOK & HOWARD, P.C.
Counsel for MEC, NRDC, SC & CUB

Date: June 13, 2023

By: _____
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