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March 9, 2023

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

Re: **MPSC Case No. U-21193**

Dear Ms. Felice:

Attached for electronic filing in the above-referenced matter, please find the **PUBLIC** Direct Testimony and Exhibits of Ryan E. Katofsky on behalf of The Michigan Energy Innovation Business Council, The Institute for Energy Innovation, Advanced Energy United, and The Clean Grid Alliance. Thank you for your assistance in this matter.

Very truly yours,

Justin K. Ooms Digitally signed by Justin K. Ooms
Date: 2023.03.09 15:28:37 -05'00'

Justin K. Ooms

JKO/srd
Enclosure
c. All parties of record.

STATE OF MICHIGAN

MICHIGAN PUBLIC SERVICE COMMISSION

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In the matter of the Application of DTE Electric Company for approval of its Integrated Resource Plan pursuant to MCL 460.6t, and for other relief.	)))))	**Case No. U-21193**

DIRECT TESTIMONY OF RYAN E. KATOFSKY

ON BEHALF OF

THE MICHIGAN ENERGY INNOVATION BUSINESS COUNCIL,

INSTITUTE FOR ENERGY INNOVATION,

ADVANCED ENERGY UNITED,

AND

CLEAN GRID ALLIANCE

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I. INTRODUCTION AND QUALIFICATIONS

Q. State your name, business name and address.

A. My name is Ryan E. Katofsky, and I am a Managing Director at Advanced Energy United, located at 1010 Vermont Ave. NW, Suite 1050, Washington, D.C. 20005.

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

A. I am appearing here as an expert witness on behalf of the Michigan Energy Innovation Business Council ("Michigan EIBC"), Institute for Energy Innovation ("IEI"), Advanced Energy United ("United;" f/k/a Advanced Energy Economy), and Clean Grid Alliance ("CGA") collectively referred to as "Michigan EIBC/IEI/United/CGA."

Q. Summarize your educational background.

A. I have a Master of Science in Engineering from Princeton University (1993), and a Bachelor of Engineering (Mechanical) from McGill University (1990).

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

A. Since May 2013, I have been employed at Advanced Energy United, where I helped establish and manage United's state regulatory engagement. This involves working with United's member companies to develop policy positions on a wide range of utility regulatory issues pertaining to distributed energy resources ("DERs"), distribution system planning, utility business model innovation, rate designs, customer and system data access, and other topics. As part of this, I have written and contributed to comments in numerous proceedings before the Michigan Public Service Commission ("Commission" or "MPSC")

as well as several other utility commissions in the United States where Advanced Energy United is an active party. Prior to working at Advanced Energy United, I spent 20 years as a consultant to the advanced energy industry, electric utilities, as well as state and federal government agencies, covering a wide range of issues related to advanced energy markets, technologies, and policies. I worked at Arthur D. Little from 1993 to 2002, Navigant Consulting from 2002 to 2008, and as an independent consultant from 2008 to 2013. In those roles, I provided market and economic analysis, developed business strategies, and supported state and federal government agencies charged with the development of advanced energy programs. Prior to that, my Master's degree (1990-1993) was a comprehensive techno-economic assessment of the production of renewable transportation fuels from biomass. My work experience is set forth in detail in my résumé, attached as Exhibit EIB-24 (REK-1).

Q. Have you previously testified before this Commission?

A. No, I have not previously testified before this Commission.

Q. Have you provided support of testimony or submitted comments in any other utility regulatory proceeding before this Commission?

A. Yes. In my role at Advanced Energy United, I have supported and reviewed testimony filed on behalf of Michigan EIBC/IEI/United in the following proceedings:

- U-20649 (Consumers Energy ["Consumers"] Voluntary Green Pricing Program case)
- Consolidated U-20713 (DTE Electric ["DTE," "DTE Electric," or the "Company"] Voluntary Green Pricing Program case)/U-20851 (DTE Electric Renewable Energy Plan case)
- U-21134 (Consumers Voluntary Green Pricing Program case)

In addition, I have written or contributed to comments filed in the following proceedings before the Commission:

- U-21227, In the matter, on the Commission's own motion, to seek comments from rate-regulated electric, steam, and natural gas utilities regarding potential utility infrastructure improvements in the state of Michigan from the federal funding available under the Infrastructure Investment and Jobs Act of 2021
- U-20147, In the Matter, On the Commission's Own Motion, to Open A Docket For Certain Regulated Electric Utilities to File Their Distribution Investment And Maintenance Plans And For Other Related, Uncontested Matters.
- U-20348, In the Matter, On the Commission's Own Motion, to Address Outstanding Issues Regarding Demand Response Aggregation For Alternative Electric Supplier Load.
- U-20633, In the matter, on the Commission's own motion, to commence a collaborative to consider issues related to integrated resource and distribution plans.
- U-20852, In the matter, on the Commission's own motion, to commence a collaborative to consider best practices to ensure cost-effective development of new energy resources and to limit procurement barriers for emerging technologies, including processes for competitive bidding.
- U-20898, In the Matter, On the Commission's Own Motion, to Commence A Collaborative to Consider Issues Related to New Technologies And Business Models.
- U-20905, In the Matter, On the Commission's Own Motion, to Examine The Changes to The Regulations Implementing The Public Regulatory Policies Act of 1978, 16 Usc 2601 Et Seq., Pursuant to Federal Energy Regulatory Commission Final Order No. 872.
- U-21099, In the Matter, On the Commission's Own Motion, to Open A Docket For Load Serving Entities In Michigan to File Their Capacity Demonstrations As Required By Mcl 460.6W.
- U-21122, In the matter, on the Commission's own motion, to review the response of Alpena Power Company, Consumers Energy Company, DTE Electric Company, Indiana Michigan Power Company, Northern States Power Company, Upper Michigan Energy Resources Corporation, and Upper Peninsula Power Company to recent storm damage in their service territories.
- U-20757, In the matter, on the Commission's own motion, to review its response to the novel coronavirus (COVID-19) pandemic, including the statewide state of emergency, and to provide guidance and direction to energy and telecommunications providers and other stakeholders.
- U-20645, In the Matter, on the Commission's Own Motion, to Establish Mi Power Grid.
- U-20747, In the Matter, on the Commission's Own Motion, to Implement the Provisions of Section 6X of 2016 Pa 341.

I have also been an active participant in several workgroups in the MI Power Grid initiative, and in addition to my work before the Commission I have been directly involved in United's interventions in the following proceedings in other states:

- In New York, the Consolidated Edison rate cases in 2019 and 2022, which included development of performance incentive mechanisms for demand response; and the Value of Distributed Energy Resources proceeding, which has dealt extensively with compensation mechanisms and tariff development for a range of DERs.
- In Illinois, Ameren's and Commonwealth Edison's 2022 Performance Metrics proceedings, which created performance incentive mechanisms for demand response, among other outcomes established in the state's Climate and Equitable Jobs Act.

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

A. In my role at Advanced Energy United, I have led the trade organization's work on state regulatory issues, which has included direct engagement in specific proceedings as well as the development of broader policy positions relevant to our engagement at utility commissions. As described above, I have participated in several workgroups at the Commission and written comments in a number of non-adjudicated cases. I also communicate formally and informally with Advanced Energy United member companies to understand how the advanced energy industry may be affected by the outcomes of the various proceedings we are engaged in. My work at utility commissions supports efforts to enable advanced energy products and services to provide economic and other benefits to utility customers and the electricity system as a whole. This includes creating opportunities for advanced energy products and services to meet customer and system needs and to identify and implement changes to utility business models that better align their financial incentives with desired outcomes.

Q. What is the purpose of your testimony?

A. The purpose of my direct testimony is to describe, based on my experiences as Managing Director at Advanced Energy United, concerns that I have with the demand response ("DR") aspects of the Company's IRP, including the level and types of DR included in DTE's Proposed Course of Action ("PCA"), the lack of DR from any source other than utility-run programs, and issues related to inclusion of DR in utility competitive bidding.

As I explain further below, I conclude that the opportunities for DR to contribute to the Company's resource needs are greater than what the Company included in its PCA. Specifically, I discuss how a recent order by the Commission in Case U-21099 regarding the ability of third-party DR aggregators to work directly with customers of Michigan utilities will create new DR opportunities that were not considered by the Company. I also review DTE's DR pilots and present electric vehicle ("EV") managed charging as one example that is indicative of the additional opportunities for DR that were not included by DTE in its PCA but that are likely to become meaningful markets within the 20-year timeframe of the Company's analysis. Finally, I discuss how it is important to include DR as part of Company competitive solicitations for capacity resources within the context of competitive bidding guidelines adopted by the Commission in proceeding U-20852.[1]

[1] See *In the matter, on the Commission's own motion, to commence a collaborative to consider best practices to ensure cost-effective development of new energy resources and to limit procurement barriers for emerging technologies, including processes for competitive bidding*, order of the Public Service Commission, entered September 9, 2021 (Case No. U-20852).

While these issues are of direct relevance to the current proceeding, I also believe they are important for the Commission to consider for future IRPs for all utilities subject to its jurisdiction.

Q. Are you sponsoring any exhibits?

A. Yes, I am sponsoring the following exhibits:

- Exhibit EIB-24 (REK-1): Résumé of Ryan E. Katofsky
- Exhibit EIB-25 (REK-2): Attachment to Discovery Response in Case No. U-21193, MNSCDE-5.7, U-21193 MNSCDE-5.7 DR Pilots.xlsx

II. CONTRIBUTION OF DEMAND RESPONSE TO RESOURCE PORTFOLIO

Q. Can you briefly explain what demand response is and how it fits into the IRP?

A. Demand response encompasses a range of options whereby customers can reduce electricity usage (demand) in response to price or other signals. Those signals can come from the local utility or from an organized wholesale market. DR can be controlled by the customer, a third party or the utility, for example, if a customer grants dispatch rights to a behind-the-meter battery owned by that customer. DR actions can include load reductions, the use of onsite generation or batteries, or combinations of these measures, all of which will reduce the amount of electricity that those customers are drawing from the grid. Demand response events typically occur during periods of peak demand or under circumstances where the supply-demand balance of the grid is threatened, for example, if one of more power plants are unable to operate or suffer unexpected outages due to extreme weather or fuel supply disruptions.

Customers of all types and sizes can provide DR, from individual residential customers to large industrials. Historically, most DR has been provided by larger commercial and industrial ("C&I") customers, but more recently, especially with the increased use of distributed energy storage and smart devices like Wi-Fi-connected thermostats, smaller customers are more readily able to provide DR. Customers that provide DR are compensated for their actions, either through utility-run and -administered programs, or via third-party DR companies, either individually or as part of an aggregation.

As it relates to the current case, it is my understanding that only DR that is registered as a Load Modifying Resource ("LMR") with the Midcontinent Independent System Operator ("MISO") and that can therefore receive MISO capacity credit, is included in the Company's IRP. As such, any potential value that DR may provide to the local distribution system is not considered. This means that DR may be undervalued and its potential contribution to meeting capacity needs could similarly be underestimated.

Q. Can you provide an overview of how DR was included and modeled in DTE's IRP?

A. My understanding is that DR has been included in two ways in the DTE IRP. First, DTE developed a year-by-year estimate of DR capacity for its existing programs. This was then used as an exogenous input to the IRP modeling and remained fixed under all scenarios, including in the PCA. The DR available from these programs is summarized in Table 1 below, which is reproduced from Witness Farrell's Exhibit A-7.1. The majority of DR in DTE's current portfolio—832 MW out of a total of 904 MW for the MISO 2022-2033

Planning Year[2]--is comprised of what I would describe as traditional interruptible rates, whereby the Company can call for interruptions for one of several reasons (depending on the program), including maintaining system integrity, making an emergency purchase, economic reasons, or when available system generation is insufficient to meet anticipated demand. A smaller portion of the existing DR portfolio, approximately 72 MW out of a total of 904 MW for the MISO 2022-2033 Planning Year, is comprised of programs that target smaller residential and commercial customers using dynamic rates or smart devices like Wi-Fi-connected thermostats. Those programs can use price signals to incent the desired behavior or allow for direct control of devices by the utility or a company acting as a contracted agent (i.e., implementer) of the utility.

Table 1: Inputs to IRP Modeling for Existing DTE DR Programs Levels and Forecasted Growth (UCAP MW)

Program Description	2023	2024	2025	2026	2027	2028	2029-2042
D1.1 Interruptible A/C	238	244	243	243	243	242	242
D1.8 Dynamic Peak Pricing/ SmartCurrents	11	11	11	17	17	17	17
D5 Interruptible Water Heating	0	0	0	6	6	6	6
Legacy Tariff Based Rates	564	563	558	561	561	559	558
R12 Capacity Release	45	50	56	61	61	61	61
Smart Savers (BYOD)	61	61	61	61	61	61	61
Total	**920**	**929**	**929**	**949**	**949**	**946**	**944**

As shown in Table 1, DTE expects that some of its existing DR programs will grow modestly between 2023 and 2026, whereas others are expected to remain at or near 2023

[2] These values are from Table 1 in Witness Farrell's testimony. They differ slightly from the IRP inputs for the year 2023 provided by Witness Farrell in Exhibit A-7.1.

levels throughout the 20-year planning horizon of the IRP. Overall, total DR capacity in existing DTE programs is estimated to grow from 920 MW in 2023 to 949 MW in 2026, or by about 3.2%. There are then some minor reductions in some assumed program sizes through 2028, after which program sizes are held constant, such that existing DR programs contribute a consistent 944 MW of capacity from 2029 all the way through 2042.

The second component of the DR analysis is comprised of several additional DR types that were evaluated in the *Michigan Demand Response Statewide Potential Study*, prepared by Guidehouse for the Commission (the "DR Potential Study").[3] As described by Witness Farrell, DTE took the results of this study and developed DR capacity estimates specific to DTE's service territory, including annual costs and MW of "Achievable Potential" for selected DR options included within the DR Potential Study. My understanding is that adjustments were made to account for existing DR capacity in DTE's current portfolio that were of a similar type to those taken from the DR Potential Study. These DR resources were then included in the IRP modeling among the list of possible resources to meet the Company's energy and capacity needs. The list of DR resources and their Achievable Potential are included in Table 2 below, reproduced from Witness Farrell's Exhibit A-7.2.

Witness Farrell also indicated that DTE added 15% to the non-capital component of DR costs for the DR options that were derived from the DR Potential Study to account for the maximum possible financial incentive that DTE could receive on its DR programs.

[3] Guidehouse Inc., Michigan Demand Response Statewide Potential Study (2021-2040) (2021).

Table 2: Achievable Potential by Option for Additional DR beyond Existing DTE DR Programs (UCAP MW)

Program Description	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Behavioral DR	0	2	1	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2
Behind the Meter (BTM) Battery Dispatch	0	0	0	0	1	1	2	2	3	4	4	5	6	7	8	9	9	10	10	10
Bring Your Own Thermostat	0	0	1	14	23	31	38	46	53	60	68	77	86	95	105	117	127	139	151	164
C&I Capacity Reduction	0	0	19	82	145	160	155	151	146	143	140	140	139	138	137	137	135	134	133	132
C&I Demand Bidding	0	5	12	16	12	9	9	9	9	9	8	8	8	8	8	8	8	8	8	8
Electric Vehicle Managed Charging	0	0	0	1	3	4	5	6	7	9	10	12	14	17	19	22	24	27	29	32
Peak Time Rebate without Enabling Tech	0	1	2	4	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4
Critical Peak Pricing with Enabling Tech	76	150	210	226	229	222	215	209	203	198	194	191	187	183	180	177	173	169	165	160
Time-of-Use	0	0	123	114	107	103	102	101	100	99	98	98	97	97	97	97	96	95	95	95
Voltage Optimization	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**76**	**158**	**369**	**459**	**528**	**539**	**533**	**531**	**527**	**527**	**531**	**539**	**545**	**552**	**562**	**572**	**579**	**589**	**599**	**609**

Q. What were the results of the Company's analysis with respect to DR?

A. As I indicated above, DTE treated existing DR programs as an exogenous input to the IRP modeling. Those resources are included in the PCA at the levels shown in Table 1 above. As for the additional DR options derived from the Guidehouse DR Potential Study summarized in Table 2 above, none were included in the PCA, despite additional DR being selected by the IRP model in several scenarios.

Q. Can you describe some of those modeling results?

A. I reviewed the results of several scenarios run by DTE.[4] Although DTE ran a range of scenarios without the new federal financial incentives from the Inflation Reduction Act ("IRA") that showed additional DR being selected, I focused on the "REFRESH" sensitivity runs that did include the impact of the IRA. In particular, I reviewed the DR results from the REFRESH runs labeled 6A, 6B, 7A, and 7B. The differences between these runs relate to the choices made regarding future plans for the Monroe and Belle River plants. As summarized in greater detail by Witness Roumpani, the difference between the scenarios labeled "6" vs. "7" is the retirement schedule for the Monroe units (2028/2032 vs. 2028/2035, respectively) and the difference between scenarios labeled "A" vs. "B" is

[4] The data for the scenarios that were reviewed were taken from the following workpapers: Manning\107 NDA WP SDM 107-REFRESH_CASE_6A_BLR28_MNR28_32\Outputs\PC\REFRESH_CASE_6A_BLR28_MNR28_32 -Resource Annual; Manning\108 NDA WP SDM 108-REFRESH_CASE_6B_BLR25_26GAS_MNR28_32\Outputs\PC\REFRESH_CASE_6B_BLR25_26GAS_MNR28_32 -Resource Annual; Manning\109 NDA WP SDM 109-REFRESH_CASE_7A_BLR28_MNR28_35\Outputs\PC\REFRESH_CASE_7A_BLR28_MNR28_35 -Resource Annual; Manning\110 NDA WP SDM 110-REFRESH_CASE_7B_BLR25_26GAS_MNR28_35\Outputs\PC\REFRESH_CASE_7B_BLR25_26GAS_MNR28_35 -Resource Annual; Manning\115 NDA WP SDM 115-REFRESH_PCA_OPT\Outputs\PC\REFRESH_PCA_OPT -Resource Annual.

whether Belle River is retired in 2028 ("A") or converted to burn natural gas in 2025/2026 ("B").[5]

In all four of these scenarios, additional DR, beyond the exogenous inputs representing existing DR programs listed in Table 1 above, is found to be cost-effective and is selected by the IRP model, as shown in Figure 1 below. In the 6A and 7A REFRESH scenarios, which retire Belle River in 2028, the IRP model selects a maximum of [redacted] MW of additional DR in [redacted], beyond the exogenous inputs representing existing Company DR programs. This is more than [redacted]% additional DR compared to DTE's PCA and represents [redacted] the Achievable Potential in that year, covering several types of DR. The amounts selected by the model in subsequent years are lower but remain above [redacted] MW for the entire study period. In the 6B and 7B REFRESH runs, about [redacted] MW of additional DR above existing DTE DR programs is selected starting in 2028, all in the "Time-of-Use" category, which has the lowest costs, per Witness Farrell's Exhibit A-7.3. This decreases to about [redacted] MW by 2042.

[5] As described in workpaper WP SDM 158 - REFRESH Sensitivity Analysis Results.xlsx

[redacted]

Q. What did DTE conclude about DR when developing the PCA?

A. As discussed by Witness Mikulan, the Company states that in the final PCA, DR was not cost-competitive with lower-cost solar plus storage resources and that no additional DR, beyond existing Company programs, was selected.

Q. How does this conclusion compare to the results of the REFRESH runs described above?

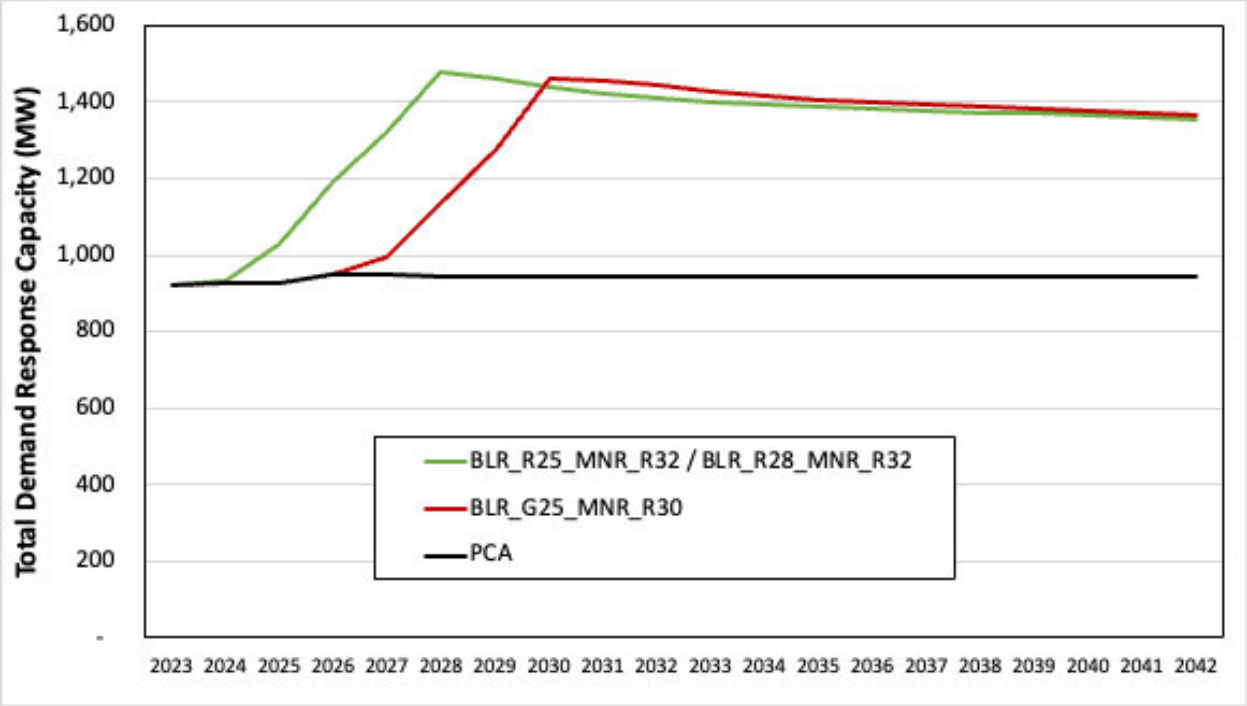
A. This conclusion appears inconsistent with the Company's modeling results. As Witness Roumpani describes in her testimony, the Company arrived at its PCA via a series of steps, using a variety of tools and making certain decisions along the way. Witness Roumpani concludes that because some of those steps were completed without consideration of the

IRA, the analysis underpinning the PCA is obsolete. Thus, it is possible that when the Company was finalizing its PCA, it concluded that no additional DR was cost-effective. However, its own analysis that I have described above clearly shows that additional DR, beyond what was assumed for their existing programs, is cost-effective even when including the impacts of the IRA.

Q. What did the analysis conducted by Strategen show with respect to DR potential?

A. The results of Strategen's modeling, conducted on behalf of Michigan EIBC/IEI/United/CGA, are detailed in the testimony of Witness Roumpani. Strategen used the same assumptions as DTE with respect to DR costs and Achievable Potential and also used the same exogenous inputs regarding DTE's existing DR programs. The results of those modeling runs with respect to DR are shown in Figure 2 below. [redacted]. The timing of the need for DR among the three scenarios modeled by Strategen differs slightly based on the assumptions regarding the timing of the retirement of the Monroe units and whether Belle River is converted to gas or retired, but in all three cases, DR plays a significantly larger role than in the PCA.

Figure 2: Total Amount of DR Selected in Strategen Modeling and Compared to the PCA



Q. Do you think the PCA is reasonable and prudent with respect to its utilization of DR?

A. No, I do not.

Q. Please explain why you think PCA is not reasonable and prudent with respect to DR.

A. As I stated above, DTE chose to exclude additional DR beyond its existing programs from its PCA even though additional DR was shown to be cost-effective under a range of modeling assumptions. This result was confirmed by Strategen's independent analysis and shows the value of DR under additional scenarios. Although there is variability in the amount of DR selected and the timing of its selection, the general conclusion that cost-effective DR has been "left on the table" by the Company is, in my view, essentially unavoidable.

It is worth noting that one of DTE's existing DR programs matches one of the categories of additional DR from the DR Potential Study but is left out of DTE's PCA, while one of DTE's current DR pilots aligns with a second category left out of the PCA by DTE. Thus, it should be reasonable for DTE to scale both of those existing options. These options are the critical peak pricing sub-option, "CPP with enabling technology," which Witness Farrell indicated is in line with DTE's existing SmartCurrents program, and the Peak Time Rebate ("PTR") sub-option that aligns with DTE's current Peak Time Savings ("PTS") pilot. The PTS pilot, according to DTE's discovery response included here as Exhibit EIB-25 (REK-2), had more than 9,700 participants at the end of 2022.

Furthermore, although I did not examine them in detail, there also appears to be alignment between other DTE DR pilots and the categories of DR that were included from the DR Potential Study. This includes the EV DR Pilot and the EV managed charging category, the C&I Storage Pilot and the Behind the Meter Battery Dispatch category, and the C&I Dashboard Pilot and the C&I Capacity Reduction and C&I Demand Billing categories. This suggests to me that at least some of the DR pilots that DTE is pursuing are likely to result in cost-effective programs. It is therefore surprising to see that DTE chose to assume the opposite—that none of its current DR pilots would result in programs that could be included in its IRP, even though the Achievable Potential for these DR categories already screens for cost-effectiveness.

Q. Because some of these DR options are similar to existing and pilot programs, is there a chance that including them would result in double counting?

A. No. It is my understanding that the Achievable Potential that DTE used to determine inputs to the IRP modeling was incremental to their existing programs, such that there is no chance that including a scaling up of these options within the PCA would result in double counting.

Q. Are there other reasons, beyond the modeling results, why you believe DTE should have included more DR in its PCA?

A. Yes. Since at least 2018, the Commission has been investigating issues related to the ban that prohibits third-party DR aggregators (also referred to as aggregators of retail customers, or "ARCs") from working with full-service customers of Michigan's IOUs.[6] Thus, the activities of these aggregators have been limited to those customers whose load is within the 10% open to retail competition. On December 21, 2022, the Commission issued an order in the capacity demonstrations proceeding, U-21099,[7] and related proceedings, partially lifting this ban to allow customers with demand of 1 MW or more to work with an aggregator, should they so choose. In that order, the Commission also

[6] See the following cases: U-21099, In the matter, on the Commission's own motion, to open a docket for load serving entities in Michigan to file their capacity demonstrations as required by MCL 460.6w; U-20348, In the matter, on the Commission's own motion, to address outstanding issues regarding demand response aggregation for alternative electric supplier load; U-21032, In the matter, on the Commission's own motion, to request comment on the MIDCONTINENT INDEPENDENT SYSTEM OPERATOR, INC.'s implementation of Federal Energy Regulatory Commission Order No. 841 regarding energy storage resources; and U-21225, In the matter, on the Commission's own motion, to open a docket for load serving entities in Michigan to file their capacity demonstrations as required by MCL 460.6w.

[7] *In the matter, on the Commission's own motion, to open a docket for load serving entities in Michigan to file their capacity demonstrations as required by MCL 460.6w*, order of the Public Service Commission, entered December 21, 2022 (Case No. U-21099) ("December 21 Order"); see also the Commission's order in the same docket granting in part and denying in part Consumers Energy Company's Petition for Rehearing of the December 21 Order, *In the matter, on the Commission's own motion, to open a docket for load serving entities in Michigan to file their capacity demonstrations as required by MCL 460.6w*, order of the Public Service Commission, entered February 23, 2023 (Case No. U-21099).

signaled its intention to eventually allow smaller customers to also work with third-party DR aggregators, after experience is gained with the larger customers. This order thus opens up additional load that DR aggregators can target, creating additional opportunities for DR to contribute to capacity needs in DTE's service territory. While it will take time for this market to develop, the fact that it is not considered at all in the PCA is a gap that leads to, in my opinion, an underestimation of DR potential. DR aggregators are uniquely qualified to seek out customers and provide innovative solutions. The order to partially lift the DR ban will also increase competition among DR providers and should therefore drive down costs, which would further increase the DR market beyond what DTE considered.

Q. Is it possible that opening up DR to third parties will result in attrition from DTE's DR programs, and if so, what is the impact of that?

A. Yes, it is possible that some customers participating in DTE's existing DR programs will choose to move over to a third-party DR aggregator. However, those resources will still need to meet the same MISO requirements for capacity accreditation and will thus still contribute to meeting DTE's overall capacity needs. What is required is one or more mechanisms that will enable DTE to continue to rely on this DR capability to meet its resource needs and capacity demonstrations. The Commission addressed this issue in its order in the ongoing capacity demonstrations proceeding, where it identified several ways in which load serving entities ("LSEs"), including utilities, could meet their capacity demonstration requirements, including contracting with third-party DR aggregators. In that order the Commission wrote:

> As to how LSEs will account for capacity in the capacity demonstration proceedings, the Commission notes that, currently, MISO LSEs can meet

> their resource adequacy obligations by securing sufficient ZRCs through a combination of Fixed Resource Adequacy Plans (FRAPs), self-supplied MW, and purchasing capacity from the MISO PRA. DR resources backed by ARCs can be utilized under all three methods. To account for ARC DR in Michigan's four-year capacity demonstration, aggregators may sell LSEs forward ZRCs bilaterally that the LSEs may then use to meet capacity planning requirements. Alternatively, LSEs may identify a portion of capacity to procure via the PRA, up to 5%, which could be backed, in part, by ARC DR.[8]

Therefore, I observe that there are multiple pathways by which utilities could continue to rely on DR, even if that DR is not part of a utility-administered program.

Q. Are there other reasons you believe DTE has underestimated the DR opportunity?

A. As described in DTE's load forecasts, building electrification is gaining momentum, as illustrated in Figure 10.3.6 in Section 10 of Exhibit A-3.1 showing heat pump saturation over the IRP study period.[9] Moreover, transportation electrification is accelerating, as also noted in DTE's load forecast described in Section 10 of Exhibit A-3.1. This is reflected in DTE's baseline forecasts and also in its High Electrification scenario. The High Electrification scenario, which aligns with the MI Healthy Climate Plan, could easily be more reflective of reality than DTE's baseline forecast. Regardless, the trend towards electrification of buildings and vehicles creates both the need for and value of additional demand management, and thus new DR opportunities that do not appear to be adequately reflected in the PCA.

Q. Do you believe that there is risk in relying too heavily on DR as a capacity resource?

[8] December 21 Order, p. 35.
[9] See also Direct Testimony of Shayla D. Manning on behalf of DTE Electric Company, Case No. U-21193, p. 82.

A. In their testimony, Company witnesses Farrell and Burgdorf highlight the risks they perceive to exist if higher levels of DR penetration are to be relied upon during the study period. They discuss factors such as the recent changes approved by FERC and implemented by MISO within the past few years for Load Modifying Resources ("LMRs"), including requirements increasing the minimum number of calls LMRs must be available for in order for to receive full capacity credit, reduced notification times, more rigorous testing and event performance requirements, and the change to the seasonal capacity market structure. Witness Burgdorf also raises the current levels of LMR capacity as a percentage of the total Planning Reserve Margin Requirement ("PRMR") in the North/Central regions compared with the entire MISO market (12.2% vs. 8.7%), showing that these regions already rely significantly more upon DR, and that there is an expectation that these resources may in the future be called upon. Witness Farrell also notes the tightening capacity supplies across MISO.

While it is true that the changes to MISO's requirements of LMRs has increased following these recent market rule changes and may continue to evolve in the coming years, the capabilities of DR-enabling technologies have improved and will continue to improve over time. Of particular note is the ability to reduce reliance on manual intervention by customers to execute load reduction measures or operate behind-the-meter energy assets to reduce their metered demand when DR events are called. Automation helps by removing one significant point of potential failure that may introduce risk of relying on existing, let alone increasing, levels of DR. While there can be risk of higher numbers of potential calls reducing customer interest and having some participants decide not to participate,

automation can help reduce the level of burden on customers, while ensuring a reliable and timely response. Customers are also often able to monitor their performance throughout events to see if they are on track or need to take additional steps to reduce their load.

In cases where DR resources are called upon multiple days in a row, some customers may suffer fatigue and have their performance reduced. Some commercial and industrial customers may have production schedules or deadlines that may cause them not to be able to participate in all events. However, under the recently approved seasonal capacity market changes, the number of calls expected of LMRs during the summer season (minimum of five events) has not changed compared to the "summer-only" version of the product. Rather, the requirements to perform have been established for each season, and MISO Market Participants and participating customers can elect whether or not to register as an LMR in each season based upon the program in which they qualify (through the utility).

DR aggregators, which have been limited in their ability to operate in Michigan except as vendors to utilities to assist with implementation of the utility DR programs or, more recently, to work with customers served by Alternative Electric Suppliers, now have the ability to work with Commission-jurisdictional utility customers, and are able to offer these products and services to help improve upon the reliability of customers' DR capabilities. Additionally, DR aggregators are able to combine customers into aggregated LMRs (within the constraints of MISO's LMR rules), leveraging the ability of individual customers that may not be able to meet the full requirements of the MISO rules to participate and contribute to the overall performance of the resource. This is yet another way to help

alleviate the risk of customer attrition from DR participation in Michigan and allow customers that may not otherwise be eligible to participate to contribute and provide benefits and value.

Q. What are your overall conclusions with respect to DR in the PCA?

A. My overall conclusion is that the PCA is too conservative with respect to DR and that in optimized portfolios that fully factor in the IRA, that there is about 50% more DR that is cost-effective that was not include by the Company.

III. DR PILOT PROGRAMS AND ADDITIONAL DR OPPORTUNITIES FOR FUTURE IRPS

Q. Can you say more about the role of pilots in the context of the IRP analysis?

A. In general, I support well-designed pilots that can demonstrate not just the viability of new technologies and services but also innovative business models and financial arrangements that leverage customer and third-party investments for the benefit of participating customers and the grid as a whole. The Commission has invested significant efforts to create a framework for pilot programs, and as part of my participation in the MI Power Grid investigation I contributed to comments that were filed with the Commission that supported the funding of well-designed pilots with clear goals for both technology and business model innovation and that recommended that utilities be required to demonstrate how pilots could be scaled.[10]

[10] See *In the matter, on the Commission's own motion, to establish MI Power Grid*, order of the Public Service Commission, entered February 4, 2021 (Case No. U-20645), pp. 6–7.

In order for pilots to yield benefits to customers, they must result in viable, scalable programs. Company Witness Farrell described five DR pilots that the Company is conducting. These include an Electric Vehicle DR pilot, a residential whole-home generator pilot, a C&I battery storage pilot, The Peak Time Savings (PTS) Pilot, and a C&I dashboard pilot. As I noted earlier in my testimony, there is overlap between the scope of these pilots and some of the DR options from the Guidehouse DR Potential Study that were included in the IRP and selected by the model in various runs but not included in the PCA. Thus, there is a disconnect between the Company's DR pilot activities and the contribution of DR to the resource portfolio, especially since, as I understand it, DTE only included DR options and Achievable Potential from the DR Potential Study that were deemed cost-effective. Thus, the failure of DTE to include any DR capacity from its pilot programs in its PCA is, in my view, a missed opportunity, especially in the context of a 20-year resource portfolio analysis, where it would be reasonable to assume that at least some of these pilots would result in viable programs. Rather than wait until DR pilots are 100% complete before contemplating how they may scale up and contribute to capacity resources, it seems reasonable to me that the Company could review their learnings to date in ongoing pilots, supplemented with benchmarking efforts referenced in the testimony of Witness Farrell, and make informed assumptions about their future potential, especially since there is good alignment between the Company's pilot programs and some of the DR categories deemed cost effective in the DR Potential Study.

Q. Can you give an example of a DR option being piloted by DTE but not included in the PCA?

A. EV managed charging is the subject of a current DTE pilot program that is also included among the DR options from the DR Potential Study. I believe it provides a good example of a missed opportunity, in part because EVs represent a source of significant future load, and also because EVs have the potential to not just be a source of demand reduction but also of supply via vehicle-to-grid ("V2G") applications, also referred to as vehicle-grid integration ("VGI"). Other utilities are already implementing EV managed charging programs on a commercial basis, indicating that that this represents a viable business opportunity. Utilities are also piloting VGI.

DTE's Electric Vehicle DR pilot program is known as the ChargingForward program. This pilot, started in 2019, looks to integrate EV load with the grid, explore new technologies, and address EV expansion equitably.[11] Company Witness Farrell noted that EV managed charging was among the DR options found to be cost-effective in the DR Potential Study "across three (3) different scenarios which represent different input parameters for participation, incentive levels, distributed energy resources (DER) adoption, avoided costs, and energy waste reduction (EWR) related adjustments."[12] However, given the large market for EVs that is anticipated, even in the Starting Point for the IRP, DTE assumed that there was only 32 MW of Achievable Potential by 2042 for EV managed charging.

Q. Please summarize DTE Electric's projection of electric vehicles in its IRP.

[11] See Exhibit A-3.1, p. 80.
[12] Direct Testimony of Keegan O. Farrell on behalf of DTE Electric Company, Case No. U-21193, p. 15.

A. Within their IRP filings, the Company discusses EVs and related matters in several places. Witness Leuker testifies that the light-duty EV stock is projected to grow 19.3% annually on average, corresponding to an annual market share of new light-duty vehicle ("LDV") sales of 22% in 2030 and 53% in 2040. Similarly, the electric fleet stock is projected to grow 20.2% annually from 2023 through 2042 in DTE Electric's service territory.[13] Combined, this translates to a projected annual EV load of 5,289 GWh in 2040.[14] He goes onto explain that different EV market penetration scenarios were considered in the High Electrification and Stakeholder sensitivity cases. Within these sensitivities, the EV assumptions align with the (then) draft of the MI Healthy Climate Plan, which targeted that 50% of light-duty vehicle sales, 30% of medium-duty and heavy-duty sales, and 100% of bus sales will be electric by 2030.[15] These sensitivities represent significantly more aggressive market penetration assumptions than what is in the Starting Point outlook for EVs, but DTE did not appear to provide load impacts for these in direct testimony. Still, Figure 10.3.4 in Witness Manning's Exhibit A-3.1 suggests that the "DTE High Case" would see the EV stocks roughly double that of the Base Case.

Witness Manning also introduced exhibits that show the saturation of light-duty and fleet EVs over time in the Company's territory through 2042.[16] Specifically, he states that the light duty EV stock will reach around 1,400,000 vehicles by 2042, or a little more than 40% of registrations, while EV fleet vehicles will reach more than 6,000 units.

[13] Direct Testimony of Markus B. Leuker on behalf of DTE Electric Company, Case No. U-21193, pp. 21–22.
[14] *Id.*
[15] See Exhibit A-3.1, p. 84.
[16] *Id.*, pp. 80–81.

Q. Please explain what you think is missing from DTE Electric's projection of electric vehicles and the contribution of EV managed charging to the IRP.

A. As a threshold matter, given the projected size of the EV market, even under the more conservative assumptions of the Starting Point in the IRP, the lack of EV managed charging within the PCA is, in my view, a major omission. Moreover, the state of Michigan has EV goals that are considerably more ambitious. Beyond that, I have identified three issues with how EV managed charging was included in the analysis. First, the vehicle projections in the DR Potential Study appear to be considerably lower than what DTE has assumed in its IRP. The DR Potential study assumes that about 1.4-1.6 million EVs will be on the road in Michigan by 2040,[17] whereas DTE's comparable estimate is about 2.5 million vehicles, as shown in Figure 10.3.4 in Witness Manning's Exhibit A-3.1.[18] The discrepancy is even greater when compared to the High Case. Second, the DR Potential Study only appears to consider residential managed charging, even though commercial managed charging would represent an additional opportunity. While the number of vehicles is considerably smaller than for LDVs, the per-vehicle opportunity is higher. Third, neither DTE nor the DR Potential study appear to consider VGI, although in response to Discovery Request MNSCDE-5.7, Witness Farrell indicated that DTE intends to study VGI in its existing EV managed charging pilot. See Exhibit EIB-25 (REK-2).

[17] See Figures 2-18 and 2-19 of the DR Potential Study.
[18] See Exhibit A-3.1, p. 81.

Q. Can you give examples of what are other jurisdictions doing with regards to EV managed charging?

A. Presently, there are several EV managed charging programs across the county. For example, in Minnesota, Xcel Energy has two time-of-use rate options for residential customers that own an EV. This allows owners to save money on their electric bills by charging their EVs during off-peak hours. They also further incentivize owners by giving them bill credits annually.[19] Another investor-owned utility, Eversource in Connecticut, offers a program that will ramp down or pause charging an EV during peak times. The program provides advanced notice to enrollees so that they avoid charging during a peak event, or they can opt out if needed.[20] In Nevada, NV Energy offers a program that if a resident enrolls in their Electric Vehicle Time-of-Use rates program, they get a special rate on the entire electric bill. All that is required of the customer is that they charge their EV during non-peak times. NV Energy offers a similar program for business as well.[21]

Q. Are there managed charging programs that have seen results and been reported on?

A. Yes. Green Mountain Power has two separate programs, Rate 72 and Rate 74. The first of these programs alerts its customers to energy peaks between four to twenty-four hours in advance. The customer can then choose whether they will continue charging with just a touch of a button on their smartphone. If they decide to keep charging, they will pay $0.73388 per kWh during peak times in contrast to $0.14274 per kWh for charging during

[19] Xcel Energy, *Optimize Your Charge*, EV.XCELENERGY.COM, https://ev.xcelenergy.com/optimize-your-charge-mn (last visited February 23, 2023).

[20] Eversource, *EV Home Charger Demand Response*, EVERSOURCE.COM, https://www.eversource.com/content/residential/save-money-energy/explore-alternatives/electric-vehicles/ev-charger-demand-response (last visited February 23, 2023).

[21] NV Energy, *Electric Vehicle Rate*, NVENERGY.COM, https://www.nvenergy.com/account-services/energy-pricing-plans/electric-vehicle (last visited February 23, 2023).

non-peak times.[22] Rate 74 allows customers to choose when they charge during regular, set, peak, and off-peak hours. If a customer charges during a peak time, the rate is $0.18035/kWh, and off-peak (all other times), it is $0.13726/kWh.[23] As a result, Green Mountain Power found that in 2021, only about 2% of Rate 72 enrollees opted out of managed charging during a peak event, while 95% of Rate 74 enrollees chose to charge during off-peak hours. This performance suggests a very high degree of engagement and performance by program enrollees. Also, through this program, Green Mountain Power identified that there are other load-management opportunities. For example, it "detected a spike in charging" at the beginning of off-peak hours and the end of peak events. According to Green Mountain Power, this could lead them to stagger "off-peak hours among customers and gradually reactivating managed chargers after a Peak Event."[24]

Another utility, Consolidated Edison in New York, has a program known as SmartCharge NY. In 2022, there were 9,923 EVs enrolled in the program, including a limited number of medium and heavy-duty vehicles. This translates to approximately 24% of EVs on the road in Consolidated Edison service territory. Performance of the program is measured in peak avoidance, whereby Consolidated Edison calculates the difference between the maximum possible demand of the vehicles enrolled and compares that to the actual observed demand from charging during the peak demand window. The maximum

[22] Green Mountain Power Corporation, *Off Peak Electric Vehicle Residential Service Rate Schedule: Company Designation 72*, GREENMOUNTAINPOWER.COM (August 14, 2020), https://greenmountainpower.com/wp-content/uploads/2020/09/Rate-72.pdf.

[23] Green Mountain Power Corporation, *Time-of-Use Electric Vehicle Residential Service Rate Schedule: Company Designation 74*, GREENMOUNTAINPOWER.COM (October 1, 2022), https://greenmountainpower.com/wp-content/uploads/2020/09/Rate-74.pdf.

[24] VERMONT PUBLIC UTILITY COMMISSION, REPORT TO THE VERMONT STATE LEGISLATURE - ACT 55: 2022 REPORT ON ELECTRIC RATES FOR ELECTRIC VEHICLES (January 14, 2022), https://epsb.vermont.gov/?q=downloadfile/549896/165269.

possible demand is based on the maximum charging capacity of each vehicle enrolled based on manufacturer specifications. That data is then summed across all participating vehicles and subtracted from the actual coincident demand observed during the peak window summed cross all participating vehicles. For example, in 2022, the potential maximum charging demand was 1,448,758 kW, while the peak observed was just 3,500 kW, or an average peak contribution of just 0.35 kW per vehicle enrolled, indicating that virtually all participants were able to avoid on-peak charging.

Q. Should the Commission also consider vehicle-to-grid technologies for demand response? If so, why?

A. Yes, this Commission and the Company should consider vehicle-to-grid technologies. As EVs increase in number, their ability to put power back onto the grid will become a meaningful opportunity. This is especially true of fleet vehicles like school buses. School buses are particularly well-suited to this application because they sit idle much of the day, especially during the summer when system peaks occur. Moreover, given the number of EVs anticipated to be on the road in the coming years, even if a small fraction of the approximately 1.4 million EVs expected to be on the road in DTE service territory by 2042 were able to participate in a VGI program, they could provide significant DR capacity. As I noted above, the Company indicated its intent to examine V2G as part of its existing EV managed charging pilot.

Q. What do you recommend the Commission do with regards to DTE's DR pilot programs?

A. I recommend that the Commission review the status and progress of the five pilots described by DTE in its IRP and direct DTE to provide more detailed information as to why none of the pilots were assumed to result in additional DR in the PCA. For future IRPs, the Commission should direct all utilities to develop and include reasonable projections for DR pilot programs that are showing promise and that are likely to be adopted as ongoing programs.

IV. COMPETITIVE PROCUREMENT OF DEMAND RESPONSE

Q. What is the importance of following the competitive procurement guidelines?

A. As described in greater detail in the testimony of witness Sherman on behalf of Michigan EIBC/IEI/United/CGA in the instant proceeding, regarding the competitive procurement guidelines established and implemented prior to DTE's IRP filing, it is important that all resource types capable of providing the products desired be eligible to participate in any procurement opportunity. Ensuring that all eligible resource types are considered broadens the field to include more eligible RFP respondents that may submit bids based upon their costs to deliver the resources necessary to meet the defined needs. Excluding resources that qualify to provide the desired services in the MISO market in procurement events, does a disservice to all captive ratepayers that may otherwise have had lower bills had some resource types not been excluded.

Q. Have DR and energy waste reduction (EWR) been eligible resources in other procurements by Commission-jurisdictional utilities?

A. No, DR and EWR resources have not been eligible to participate in other Commission-jurisdictional utility RFPs. As an example, the RFP issued following the settlement agreement reached in Consumers' 2021 IRP was presented as being "all-source," when in fact it was not. The RFP's language explicitly stated that the eligible resource types were to be "generation" resources, thereby excluding non-generating resource types such as DR and EWR. When the Independent Administrator was asked during the procurement process as to whether DR and EWR would be eligible, the response received was "no."[25]

Q. Do you expect, based upon DTE's IRP filing, that any future solicitations will truly be "all-source" and comply with the Commission's procurement guidelines and allow DR and EE resources to be considered as eligible resource types?

A. No, I do not, based on key phrases used in the testimony of Company witnesses Leslie and Hernandez when discussing the procurement. Witness Leslie discusses all-source procurements in the context of being inclusive of renewable resources, which implies specific types of generation technologies. In witness Hernandez's testimony, she is clear that the procurement processes are "consistent with" and "aligned" with the Commission's competitive procurement guidelines, and would incorporate energy storage and renewable energy resources. However, she does not state that future RFPs will comply with the Commission's guidelines.

[25] Consumers Energy Company, *FAQ*, CONSUMERS-RFP.COM (September 9, 2022, revised November 28, 2022), https://www.consumers-rfp.com/FAQ.

Q. What recommendations do you have to ensure that the Commission's competitive procurement guidelines are followed in future procurement events?

A. The Commission should require DTE, as well as all Commission-jurisdictional utilities, to adhere to its competitive procurement guidelines to ensure that competitive procurements are technology neutral, transparent, and non-discriminatory. PURPA regulations permit a state regulatory authority to use a price determined pursuant to a competitive solicitation process to establish rates for PURPA qualified facilities ("QF") making sales to utilities. FERC adopted the so-called *Allegheny* principles in Order 872, stating that "[a] primary feature of a transparent and non-discriminatory competitive solicitation is that a utility's capacity needs are open for bidding to all capacity providers, including QF and non-QF resources, on a level playing field."[26] These regulations require, among other things, that "Solicitations are open to all sources, to satisfy that electric utility's capacity needs, taking into account the required operating characteristics of the needed capacity."[27]

In addition, because the Commission has ordered that full-service customers of utilities can now work with third-party DR aggregators, one way in which the DR capacity under the management and control of those aggregators can be used by utilities to meet their capacity needs, including in their capacity demonstrations, is to allow DR to participate in utility RFPs for capacity resources. As I noted above, the Commission identified several ways in which LSEs could meet their capacity demonstrations requirements, including contracting with third-party DR aggregators.

[26] Qualifying Facility Rates and Requirements Implementation Issues Under the Public Utility Regulatory Policies Act of 1978, 85 Fed. Reg. 54638, 54690 (Sept. 2, 2020); see *Allegheny Energy Supply Company, LLC*, 108 FERC ¶ 61,082, at 22 (2004).
[27] 18 C.F.R. § 292.304(b)(8)(i)(B).

V. CONCLUSIONS AND RECOMMENDATIONS

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

A. I recommend that the Commission:

1. Direct DTE to include a minimum of an additional 500 MW of DR over the next 20 years, consistent with the modeling results described above that support this level of additional DR.
2. For future IRPs, direct the Company and all Commission-jurisdictional utilities to develop reasonable projections for DR pilot programs that are showing promise and that are likely to be adopted as ongoing programs, and include those projections in their IRP analyses.
3. For future IRPs, direct DTE and all commission-jurisdictional utilities to include EV managed charging and VGI in their IRP analyses.
4. Include DR and EWR as eligible resources in all Company competitive procurements.

Q. Does that complete your testimony?

A. Yes.

STATE OF MICHIGAN

MICHIGAN PUBLIC SERVICE COMMISSION

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In the matter of the Application of DTE Electric Company for approval of its Integrated Resource Plan pursuant to MCL 460.6t, and for other relief.	)))))	**Case No. U-21193**

EXHIBITS OF RYAN E. KATOFSKY

ON BEHALF OF

THE MICHIGAN ENERGY INNOVATION BUSINESS COUNCIL,

INSTITUTE FOR ENERGY INNOVATION,

ADVANCED ENERGY UNITED,

AND

CLEAN GRID ALLIANCE

Ryan E. Katofsky

Professional Experience

05/2013–present **Advanced Energy United** Washington, DC

Managing Director (01/2019-present); VP, Industry Analysis (07/2016-01/2019); Sr. Director, Industry Analysis (07/2015-06/2016); Director, Industry Analysis (05/2013-06/2016)

- Lead United's state regulatory engagement, including United's interventions in adjudicated and non-adjudicated proceedings at state utility commissions.
- Engage directly in state utility commission proceedings and stakeholder processes, focused on accelerating the energy transition and aligning the utility business model with state policy goals.
- Working with members, develop policy positions on the range of regulatory policy issues affecting the advanced energy industry.
- Subject matter expert supporting development of United's publications and report, including leading development of the Advanced Energy Market Report.
- Lead the development of the market opportunity assessment for United's annual policy portfolio prioritization.

06/2008–05/2013 **Independent Consultant** Arlington, MA

Independent consultant providing renewable energy and clean energy consulting and advisory services.

- Supported the VP of Technology/VP of Strategy of a major gas/electric utility in developing and managing its clean energy portfolio, with a focus on renewable energy, low-carbon technologies, electric transportation, and smart grid. Supported development of the broader business strategy for North America.
- For Advanced Energy Economy, provided a range of support to their Industry Analysis team as it built out its content library; supported other parts of the AEE organization.
- Strategic support and analysis for the Renewable Energy Technology Deployment Implementing Agreement of the International Energy Agency, focused on the role of renewable energy in global energy scenarios.
- For a major oil and gas company, provided strategic support to their Alternative Energy business unit.
- For a startup technology company, conducted an independent energy and emissions "well-to-wheels" analysis of different shale oil production processes.
- For a major investment bank, provided an independent review and assessment of national and global projections of renewable energy market development.
- For a local renewable energy firm, provided an independent review of their wind power pro-forma model.

04/2002–06/2008 **Navigant Consulting, Inc**. Burlington, MA

Managing Consultant, promoted to Associate Director in March 2005

- Subject matter expert in renewable energy technologies, markets, businesses and policies, with particular expertise in biomass power, biofuels, integrated biorefineries, and photovoltaics.
- Project manager responsible for managing multiple projects annually with budgets of up to $400,000 each. Managed subcontractors as needed.
- Lead role in developing/overseeing analytical models for levelized cost of electricity, RPS markets, renewable energy technology performance forecasts, and renewable energy market forecasts.
- "Well-to-wheels" analysis of conventional and alternative fuel chains (energy, emissions, economics).
- Managed client relationships and developed new business in renewable energy. Clients included electric utilities, renewable energy equipment manufacturers, global energy companies, and state and Federal agencies, including the US DOE, National Renewable Energy Laboratory, California Energy Commission, NJ Office of Clean Energy, Massachusetts Technology Collaborative.
- Provided mentoring to and conducted performance evaluations of junior staff.

10/1993–04/2002 **Arthur D. Little, Inc.** Cambridge, MA

Consultant, Senior Consultant, Manager, Senior Manager

- Conducted a wide range of projects for clients focused on market and technology assessment of renewable energy, fuel cells, microturbines and advanced gas turbines.
- Developed "well-to-wheels" analysis of conventional and alternative fuel chains (energy, emissions, economics).
- Conducted detailed thermodynamic modeling of reformer/fuel cell systems to support development of a multi-fuel fuel processor.
- As Senior Manager, served as a Group Manager responsible for career development and performance evaluation of junior staff, including making recommendations for promotion.

Education

1990–1993 **Princeton University** Princeton, NJ

- Master of Science in Engineering (Mechanical & Aerospace), GPA: 3.6/4.0
- Research conducted at the Center for Energy and Environmental Studies (now part of the Princeton Environment Institute)
- Thesis topic: The production of renewable transportation fuels from biomass via gasification
- Guggenheim Fellowship (one of five awarded annually)

1986–1990 **McGill University** Montreal, Quebec

- Bachelor of Engineering (Mechanical), GPA: 3.8/4.0
- British Association Medal for Great Distinction; University Scholar

Community Leadership

- 2008-2014: Arlington Soccer Club youth soccer coach
- 2012: Community Solar Coach in the Solarize Arlington campaign
- 2016-present: Community Representative on the Arlington High School Building Committee; Chair of the Sustainability Subcommittee
- 2018-present: Member, Arlington Clean Energy Future Committee (Chair as of February 2013), which leads the town's efforts to become carbon neutral by 2050

Case: U-21193
Request: MNSCDE-5.7
Respondent: K. Farrell

	MNSCDE-5.7a	MNSCDE-5.7b	MNSCDE-5.7c	MNSCDE-5.7d
Pilot	**Description**	**# of Participants - Current**	**# of Participants - Expected**	**Duration of Pilot**
Peak Time Savings (PTS)	The PTS pilot is structured to reward customers for reducing energy consumption during the Company's called Peak Time Events. The participating customers receive bill credits for each event based on measured reductions in customers' energy demand relative to a pre-established baseline, which was been initially developed based on features of comparable utility programs. Unlike the Company's current DPP rate, the PTS pilot does not change or increase a customer's electric rate during peak events, but instead provides customers with a no-risk introduction to demand response.	9,748 (as of 12/31/2022)	Up to 10,800	The PTS pilot launched in June of 2021 with limited-time recruitment and is scheduled to conclude at the end of September 2023.
Electric Vehicle (EV) DR Pilot	Smart Charge is a pilot that is designed to assess the effectiveness of the Open Vehicle Grid Integrated Platform (OVGIP) concept to integrate EV charging with grid objectives through demand response. The Company continues to conduct a pilot that involves a partnership with select automotive manufacturers (OEMs) in its electric service territory. The Company and the OEMs seek a better understanding of the responsiveness of the EV owners and their willingness to participate in DR events, specifically targeted at vehicle charging and the amount of energy that is curtailed or avoided through events. Beginning in 2023, the Company will begin to study managed charging, in parallel with the current DR pilot initiatives, as well as evaluate Vehicle to Grid (V2G/V2H) opportunities in collaboration with the OEMs.	606 (as of 12/31/2022)	Up to 1,000	SmartCharge launched in 2019. Currently, there is no scheduled conclusion date.
Residential Whole-home Generator Pil	The Company plans to conduct a residential customer-owned natural gas generator pilot. The pilot will leverage Generac Grid Services' platform and utilize telemetry to shift customers' electric load to the customers' generator in real-time during peak events. Customers will receive an incentive for their participation in the program.	0	Up to 200	The anticipated start date of the pilot is the summer of 2023 with scheduled conclusion in 2025.
Commercial & Industrial (C&I) Storage Pilot	The battery energy storage pilot is a behind-the-meter (BTM) lithium-ion battery energy storage system (BESS) at two customers' sites. It is designed to test the ability to achieve peak demand shaving or shifting during demand response events.	1 very interested customer has been identified and conversations regarding next steps and contract execution are ongoing	Up to 2	The anticipated start date of the pilot is the summer of 2023 with scheduled conclusion in 2025.
Commercial & Industrial (C&I) Dashboard Enhancement*	The Company is planning to partner with a program implementer to provide C&I customers who take service under a demand response tariff (i.e. D8, R10 and R12) with technology and software so customers can better understand and sequentially, improve upon their event performance.	0	Unknown	Unknown

*The C&I Dasboard Enhancement is not considered a pilot by the Company but instead, an enhancement to its current DR Tariff offerings.

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

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In the matter of the Application of DTE ELECTRIC COMPANY for approval of its integrated resource plan pursuant to MCL 460.6t and for other relief.	)))))	Case No. U-21193

PROOF OF SERVICE

STATE OF SOUTH CAROLINA)
) ss.
COUNTY OF BERKELEY)

Summer R. Dukes, the undersigned, being first duly sworn, deposes and says that she is a Paralegal at Potomac Law Group PLLC and that on the 9th day of March, 2023 she served a copy of the **PUBLIC** Direct Testimony and Exhibits of Ryan E. Katofsky on behalf of The Michigan Energy Innovation Business Council, The Institute for Energy Innovation, Advanced Energy United, and The Clean Grid Alliance, upon those individuals listed on the attached Service List via email.

Summer R. Dukes

Digitally signed by Summer R. Dukes
Date: 2023.03.09 15:29:12 -05'00'

Summer R. Dukes

March 3, 2023

Case No. U-21193
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March 3, 2023

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*Signed Nondisclosure Certificate under the Protective Order for this case.
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