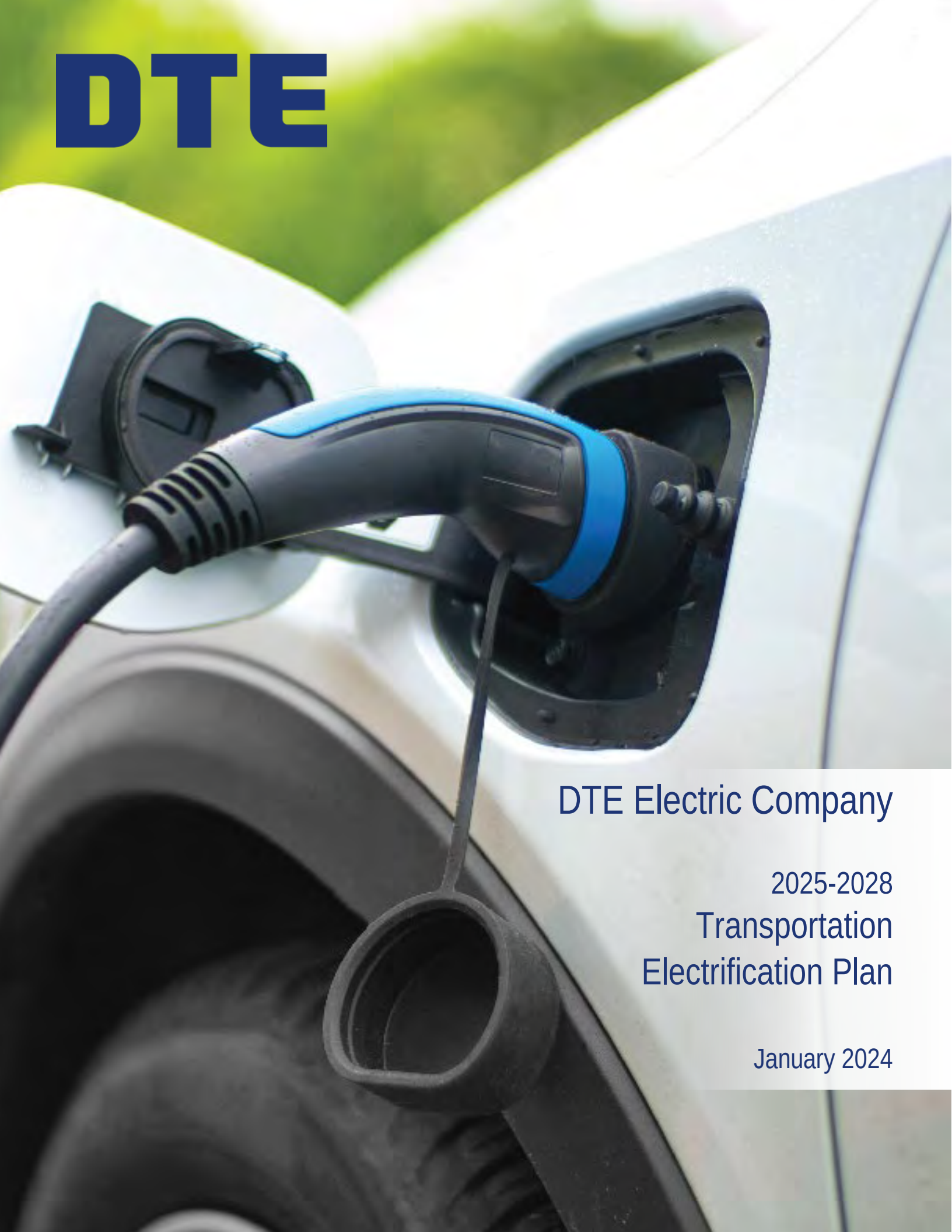

DTE

DTE Electric Company

2025-2028 Transportation Electrification Plan

January 2024

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Tables and Figures

Abbreviations

ACEEE .... American Council for an Energy Efficient Economy
BCA ..... Benefit-Cost Analysis
BEV ..... Battery Electric Vehicle
BIL ..... Bipartisan Infrastructure Law
BYOC ..... Bring Your Own Charger
CAGR ..... Compound Annual Growth Rate
CE..... Consumers Energy
CFM..... Clean Fuels Michigan
CIAC ..... Contribution in Aid of Construction
ComEd..... Commonwealth Edison
ConEd..... Consolidated Edison
CSB…….Clean School Bus
DAC ..... Disadvantaged Community
DCFC..... Direct Current Fast Charger
DDOT ... Detroit Department of Transportation
DGP..... Distribution Grid Plan
DOE..... Department of Energy
DTE ..... DTE Energy
DTEE ..... DTE Electric (or “the Company”)
E&O ..... Education & Outreach
EEI..... Edison Electric Institute
EGLE ..... Department of Environment, Great Lakes, and Energy
EJC..... Environmental Justice Community
EPRI ..... Electric Power Research Institute
EV..... Electric Vehicle
GM..... General Motors
GWh ..... Gigawatt-hour
IBEW ..... International Brotherhood of Electric Workers
IRA..... Inflation Reduction Act
IRP..... Integrated Resource Plan
IT ..... Information Technology
KPI..... Key Performance Indicator
kV ..... Kilovolt
kW ..... Kilowatt
LI..... Low-Income
LMI..... Low- and Moderate-Income
MDOT ..... Michigan Department of Transportation
MEIBC ..... Michigan Energy Innovation Business Council
MHDV ..... Medium- and Heavy-Duty Vehicles
MPSC ..... Michigan Public Service Commission
MTEC..... Midcontinent Transportation Electrification Collaborative
MUD ..... Multi-Unit Dwelling
NEVI ..... National Electric Vehicle Infrastructure
NPV ..... Net Present Value
NRDC ..... National Resources Defense Council
NYSE..... New York Stock Exchange
OEM ..... Automaker Original Equipment Manufacturer
OFME ..... Office of Future Mobility & Electrification
OVGIP ..... Open Vehicle-Grid Integration Platform
SBAM..... Small Business Association of Michigan
SCE ..... Southern California Edison
SEMCOG Southeast Michigan Council of Governments
SFH ..... Single-Family Home
TE ..... Transportation Electrification
TEP ..... Transportation Electrification Plan
TOD ..... Time of Day
UMR ..... Utility Make-Ready
V2G ..... Vehicle-to-Grid
V2H..... Vehicle-to-Home
ZEV..... Zero Emission Vehicle

1 Executive Summary

1.1 Strategic Goals and Objectives

DTE Electric (DTEE or the Company) has an important role to play in reliably accommodating new electric vehicles (EVs) on the grid and accelerating the transition to help the State of Michigan and its citizens achieve their decarbonization goals. DTE Electric's EV program, Charging Forward, launched in 2019 and has continued to grow and evolve and in November 2022, the Michigan Public Service Commission (MPSC) requested DTEE to *"submit a full scale, well-developed, permanent Charging Forward proposal that includes a BCA [benefit-cost analysis]"* (Case No. U-20836 Order dated November 18, 2022, p. 351). As a result, the Company has spent the last year developing a comprehensive transportation electrification plan (TEP) with in-depth benchmarking, robust analyses, stakeholder engagement, and careful evaluation of the role of the utility to guide productive and prudent investment in the transportation electrification sector for the 2025-2028 timeframe. The Company is filing the TEP in Case No. U-21538 in compliance with the MPSC's December 21, 2023 Order in that docket.

To guide its strategy and TEP development, the Company first benchmarked other TEPs to establish key themes that informed its approach and program proposals. Next, DTEE determined the charging infrastructure required to support forecasted EV adoption, which could increase from about 46,000 EVs in Southeast Michigan today to approximately 326,000 by 2028. The resulting market size estimates that approximately 238,000 incremental chargers will be needed in the DTEE service territory over the four-year TEP time horizon, requiring nearly $1.9 billion of infrastructure investment. This total infrastructure investment will ultimately need to be funded by a mix of public, private, government, and utility sources. While DTEE will fully support the needed infrastructure investment through utility make ready, DTEE's proposed programs in this TEP support approximately 19,300 chargers, with rebates, and comprise the utility portion of investment for Southeast Michigan, pending MPSC approval. The portfolio results in $56 million rate relief for DTEE customers for the full investment and was designed with the following guiding principles in mind:

- Support and accelerate EV adoption by facilitating charger deployment while maintaining affordability benefits for all DTEE customers at the portfolio level,
- Consider unique reasons for utility participation such as closing charging gaps and improving economics of electrification in the near-term, and

- Promote equity with a focus on low-income (LI) customers and disadvantaged communities (DACs).

Working closely with stakeholders during the development and execution phases is helpful to enable a balanced, well-aligned plan for the State of Michigan. Overall, surveyed stakeholders overwhelmingly indicated DTEE's engagement approach met expectations, with 83% of surveyed organizations stating they were either "satisfied" or "very satisfied," with the balance stating they were "neutral." Providing transparency into DTEE's EV investment strategy with the TEP informs the public and maximizes coordination effectiveness with regional and other organizations on their transportation electrification (TE) efforts to guide optimal use of funds. DTEE's Charging Forward program currently has funding to continue programming through 2024. Thereafter, this proposed TEP would take effect, pending approval by the MPSC in the next general rate case.

1.2 Summary of Recommendations

DTE will fully support the needed infrastructure investment through utility make ready. The proposed TEP portfolio achieves DTEE's guiding principles by facilitating charger deployment for key segments through rebates, while maintaining affordability benefits for all DTEE customers at the portfolio level, closing charging gaps and improving economics of electrification in the near-term, and promoting equity with a focus on LI customers and DACs. The portfolio is summarized in Table 1 below:

Table 1 Proposed TEP Rebate Programs, 2025-2028

Customer Segment	Customer Sub-Segments	Rebate[1]	No. of Rebates	Share of Market	Total Investment (M)
Single-Family Homes	LI Level 2	$2,200	10,900	100%	$24.0
Multi-Unit Dwellings	LI Level 2	$14,400	485	90%	$7.0
	Non-LI Level 2	$5,000	4,130	45%	$20.7
Public	DAC/rural on-route DCFC	$70,000	310	35%	$21.6
	All other on-route DCFC	$50,000	310	35%	$15.4
Fleet	Transit bus DCFC	$70,000	33	100%	$2.3
	School bus DCFC	$70,000	100	30%	$7.0
	Other DCFC	$70,000	285	30%	$20.0
	Level 2	$2,500	2,735	90%	$6.8
			Total Rebate Investment		**$124.8**

This portfolio supports approximately 18,250 Level 2 charger ports and 1,040 direct current fast chargers (DCFCs). On-route charging makes up the biggest category of investment at 30%, followed closely by fleet at 29%, multi-unit dwellings (MUDs) at 22%, and single-family homes (SFHs) at 19%. Out of DTEE's proposed rebate investment of $125 million, half would go to segments promoting equity in EV and EV infrastructure access. In addition to approximately $125 million in charger rebate investment, DTEE is proposing approximately $20 million in Supporting Functions: $7.3 million for Program Administration, $6.0 million for continued Education & Outreach, $4.0 million for the Emerging Technology Fund, and $2.5 million for data capabilities. Taken together, Supporting Functions make up less than 15% of total TEP investment of $145 million, which is in-line with other TEP benchmarking results. Overall, the TEP portfolio-level BCA results in $56 million of rate relief for DTEE customers.

Through the TEP, DTEE will establish a foundational capability to monitor, facilitate, and develop the EV charger network in Southeast Michigan in a prudent and effective way. The Company will closely watch market signposts, remain agile, and scale its programs accordingly while ensuring alignment with the overarching TEP guiding principles. Maintaining flexibility to adjust program parameters to market dynamics – while simultaneously adhering to programmatic guiderails – is

[1] LI SFH and LI MUD are average estimates based on total installation costs and would not exceed actual costs

critical to minimize risk of stranded investment while effectively supporting the EV charger network and MI Healthy Climate Plan.

2 Introduction

2.1 Scope and Purpose

As the new fuel provider for EVs, DTEE has an important role to play in not only reliably accommodating new EVs on the grid but also accelerating the transition to help the state of Michigan and its citizens achieve its decarbonization goals. The Company has had success with its Charging Forward pilots to date, so with the November 2022 Order in Case No. U-20836, the MPSC has requested for DTEE to *"submit a full scale, well-developed, permanent Charging Forward proposal that includes a BCA [benefit-cost analysis]."* As a result, the Company has spent the last year developing a comprehensive TEP with in-depth benchmarking, robust analyses, and careful evaluation of the role of the utility to guide productive and prudent investment. The purpose of this TEP is to provide key takeaways from the benchmarking and market assessment conducted, the Company's overall strategy to support TE and manage the corresponding load, proposed customer programs and investment levels, and the resulting BCA for the 2025-2028 timeframe. Providing transparency into DTEE's EV investment strategy with the TEP informs the public and maximizes coordination effectiveness with regional and other organizations on their TE efforts to guide optimal use of funds.

2.2 Company Overview

DTE Energy (NYSE:DTE) is a Detroit-based diversified energy Company involved in the development and management of energy-related businesses and services nationwide. Its operating units include an electric Company serving 2.3 million customers in Southeast Michigan and a natural gas Company serving 1.3 million customers in Michigan. The DTE portfolio includes energy businesses focused on custom energy solutions, renewable energy generation and energy marketing and trading. Through its commitment to cleaner energy, DTE Electric plans to reduce CO2 emissions by 90% and DTE Gas will plan to reduce methane emissions 80% by 2040 to produce cleaner energy while keeping it safe, reliable and affordable. DTE Electric and Gas aspire to achieve net zero carbon emissions by 2050. DTE is committed to serving with its energy through volunteerism, education and employment initiatives, philanthropy and economic progress. Information about DTE is available at dteenergy.com, empoweringmichigan.com, twitter.com/dte_energy and facebook.com/dteenergy.

2.3 Vision and Guiding Principles

DTEE's EV vision, in support of its net zero commitments, is to power and enable a cleaner energy future for its customers through transportation electrification. The Company aims to do this by:

- Accelerating customers' journeys to EV adoption through programming that includes enhancing the state's charging network, beneficial electric pricing options, and advisory services,
- Amplifying EV benefits and breaking down barriers for all the communities it serves, with an intentional focus on low- and moderate-income customers and disadvantaged communities,
- Intelligently integrating EV load with the grid of the future by using advanced technologies to reduce peak demand and minimize costs to all customers, and
- Striving to deliver reliable, cleaner energy to power EVs and reduce state-wide carbon emissions.

DTEE's TEP was developed to enable this vision while adhering to the following guiding principles:

- Support and accelerate EV adoption by facilitating charger deployment while maintaining affordability benefits for all DTEE customers at the portfolio level,
- Consider unique reasons for utility participation such as closing charging gaps and improving economics of electrification in the near-term, and
- Promote equity with a focus on low-income customers and disadvantaged communities.

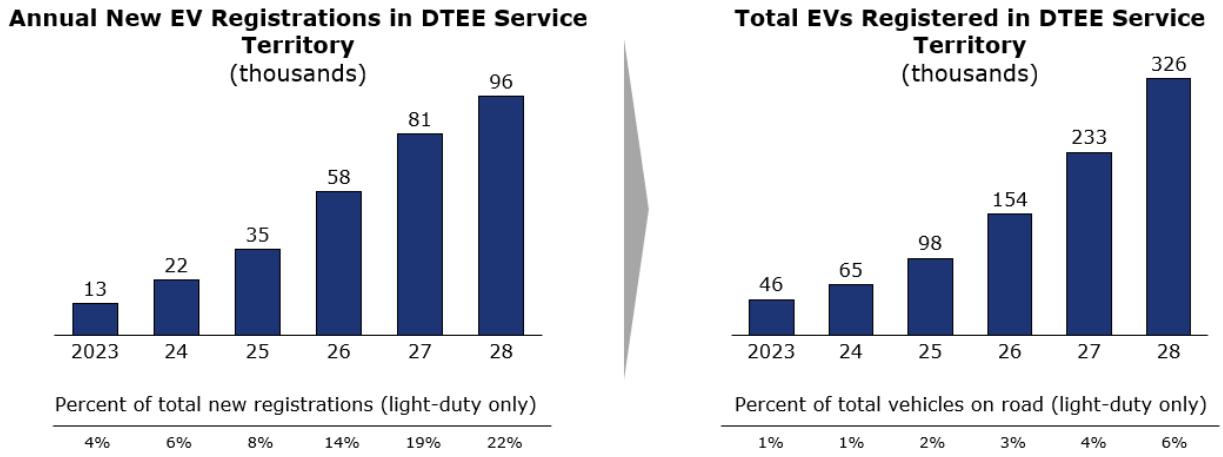
2.4 EV Market in Southeast Michigan

In DTEE's service territory of Southeast Michigan, EV sales have grown at a compound annual growth rate (CAGR) of 90% from 2019 to 2022, with approximately 13,100 EVs sold last year compared to about 1,900 EVs in 2019. Year to date, 77% of newly sold EVs are registered in the DTEE service territory, and 74% of those are all-electric (BEVs).[2] There are currently about 46,000 EVs on the road in Southeast Michigan, and the Company forecasts that could increase to approximately 326,000 – including medium-duty and heavy-duty vehicles (MHDVs) – by 2028, the last year of this TEP, as shown in Figure 1 below.[3] There are about 1,170 public Level 2

[2] The balance are plug-in hybrid EVs; regenerative hybrids and hydrogen fuel cell vehicles are not considered EVs
[3] Data from S&P Global as of September 30, 2023

chargers and 210 DCFCs reported as operable in the DTEE service territory according to the Department of Energy (DOE) Alternative Fuels Data Center.[4]

Figure 1 DTEE Forecast of Annual New EV Registrations and Cumulative Registered EVs[5]



Fuel economy and environmental impact are the top two purchase drivers among surveyed EV owners at 65% and 62%, respectively. The top three concerns of switching to an EV are all related to range anxiety for non-EV owners: location and availability of charging stations (71%), distance that can be traveled on a full charge (68%), and time it takes to recharge an EV (63%). One in four non-EV owners are not aware of a single public charging station, despite hundreds available, and only 15% of non-EV owners viewed themselves as "very familiar" with EVs. These findings indicate lack of awareness of EVs and their associated benefits as another key barrier to adoption.[6]

2.5 State and Federal Policies and Programs

In September 2020, Governor Whitmer signed Executive Directive 2020-10, which included a plan for Michigan to reach economy-wide, net-zero emissions by 2050. It also directed the Department of Environment, Great Lakes, and Energy (EGLE), to develop a pathway to a 100% carbon neutrality goal. In April 2022, EGLE filed the MI Healthy Climate Plan, which includes six "Key Strategies" towards one of its key action goals: electrify vehicles and increase public transit. Later that year, the state unveiled the MI Future Mobility Plan to continue Michigan's leadership in the transportation industry. A shared goal between both plans includes deploying 100,000 chargers

[4] As of November 29, 2023
[5] Registration volume includes medium-duty and heavy-duty vehicles
[6] September 2023 DTE Residential Tracking Survey, n=550 (150 EV owners and 400 non-EV owners)

to support two million EVs by 2030. To support those efforts, the State of Michigan's budget for the 2023-2024 fiscal year invests more than $145 million in clean mobility initiatives, including $125 million to fund a clean school bus grant program.

Two federal laws are also making a big impact on the EV market: the Bipartisan Infrastructure Law (BIL) signed into law November 2021 and the Inflation Reduction Act (IRA) signed into law August 2022. Through the National Electric Vehicle Infrastructure (NEVI) portion of the BIL, a minimum of $7.5 billion will be deployed over the next five years to fund a public DCFC network. As part of that, the Michigan Department of Transportation (MDOT) will receive and distribute $110 million in NEVI funds to build out Michigan alternative fuel corridors. The BIL contains an additional $32.5 billion eligible to support EVs, including the Environmental Protection Agency's Clean School Bus (CSB) Rebate program. Of note here, are the proactive partnership efforts that the eFleets Advisory Services team took to successfully promote the CSB program by reaching out to all the school districts in DTEE service territory – over 160 – and following up, with multiple touch points, with the 53 districts that were identified as prioritized by the EPA. As a result, school districts in DTEE applied for over 200 electric school buses, with 66 ultimately awarded to eight school districts and Michigan outperformed expectations in round one by receiving the fifth-highest number of awards in the country, with 24 districts winning a total of 133 electric buses.

The IRA includes $47 billion eligible to support EVs, not including funding to support the $7,500 consumer tax credit for light-duty EVs. The upfront price of an EV is observed as another key barrier to adoption with 60% of non-EV owners listing it as a top concern,[7] which can hopefully be assuaged with the recent availability of IRA federal tax incentives at the point of purchase.[8]

2.6 Summary of DTEE's Charging Forward Program

Since its initial approval from the Michigan Public Service Commission (MPSC) in May 2019, the Charging Forward program has continued to grow and evolve, powering approximately 35 million miles through the chargers rebated, saving over one million gallons of gasoline, and eliminating over 8,000 metric tons of CO_2 emissions. The original pilot, proposed in July 2018 with Case No. U-20162, was approved in May 2019. Building on the momentum of the fleet element in the initial filing, the Company proposed Charging Forward eFleets (eFleets) in Case No. U-20935 in December 2020 and received approval in March 2021. The third iteration of funding - for the Charging Forward Expansion - was approved in November 2022 in Case No. U-20836. Most

[7] September 2023 DTE Residential Tracking Survey, n=400
[8] Treasury lays out rules for instant EV rebate - POLITICO

recently, in December 2023, the MPSC approved funding in Case No. U-21297 to continue Charging Forward programming through 2024 as a bridge to the TEP that will begin in 2025 (pending approval).

Business Expansion Elements include the following business customer offerings: Business Charger Installation, Charging Hubs, eFleet Battery Support, and the Emerging Technology Fund. Customer Outreach includes the Education and Outreach approved with each program plus eFleet Advisory Services. Residential Programs include Home Charger Rebates, Home Charger Installation, and EV Rebates. The total investment has supported the installation of over 6,300 chargers with approximately 460 more approved and awaiting installation as shown in Table 2 below.

Table 2 Charging Forward Charger Rebate Status as of December 2023

Charging Forward Program	Installed	Pending Installation	Total Approved
Home Charger Rebates	4,928	0	4,982
L2 Business Charger Rebates	1,191	217	1,408
DCFC Business Charger Rebates	61	88	149
L2 eFleet Charger Rebates	132	68	200
DCFC eFleet Charger Rebates	11	88	99
Total	**6,323**	**461**	**6,838**

Other key Charging Forward accomplishments to date include:

- Achieving nearly 195 million customer Education & Outreach (E&O) impressions,
- Developing EV websites with valuable resources for residential and business customers, with over 1 million views since launch,
- Conducting over 2,200 eFleet Advisory Services consultations with about 405 total cost of ownership analyses for business customers,
- Approving 64 eFleet Charger Rebates for the seven school districts that were awarded federal Clean School Bus program funds,
- Providing turnkey Home Charger Installation for over 600 customers,
- Approving over 140 EV Rebates for income-qualified customers,

- Enrolling nearly 200 customers in EV Data Sharing and over 650 customers in DTE Smart Charge,
- Approving six pilots through the Emerging Technology Fund, and
- Facilitating the "Truck Stop of the Future" BIL grant for the State of Michigan in partnership with Daimler Truck North America and the State of Michigan.

As stated above, Charging Forward has funding to continue programming through 2024. Thereafter, this proposed TEP would take effect, pending approval by the MPSC in the next DTEE general rate case.

3 TEP Development

3.1 Benchmarking

To guide DTEE's strategy and TEP development, the Company analyzed six utility TEPs in-depth,[9] reviewed the American Council for an Energy Efficient Economy (ACEEE) report "Utility Transportation Electrification Planning – Emerging Practices to Support EV Deployment," from September 2022, in detail and has consistently participated in national EV working groups. This benchmarking allowed DTEE to establish key themes that have informed DTEE's approach and program proposals. A high-level summary of these TEPs at the time DTEE benchmarked them is in Table 3 below.

[9] Commonwealth Edison (ComEd), Consolidated Edison (ConEd), National Grid Massachusetts (National Grid), Southern California Edison (SCE) Charge Ready 2, SCE Charge Ready Transport, Xcel Colorado, and Xcel Minnesota

Table 3 Overview of Six TEPs Benchmarked as of Q4 2022[10,11]

Company	State	Electric Customers (millions)	Program Years	Investment (millions)	# of Charging Ports (L2 | DCFC)	2030 EV Forecasts
comed AN EXELON COMPANY	IL	4.1	'23-'25	$270	7,730 | 196	700,000
conEdison	NY	3.8	'21-'25	$290	18,500 | 457	500,000
nationalgrid	MA	2.2	'22-'25	$278	31,400 | 393	500,000
SOUTHERN CALIFORNIA EDISON	CA	1.4	'21-'25	$793	24,500 | 205	2,600,000
Xcel Energy	CO	5.2	'21-'23	$108	19,800 | 210	500,000
Xcel Energy	MN	1.5	'23-'26	$384	0 | 1,470	800,000
DTE (proposed)	MI	2.2	'25-'28	$145	18,250 | 1,040	600,000

While the programmatic focus varies widely across the country (e.g., make-ready rebates vs. utility ownership, EV incentives vs. charger incentives, etc.), there are several key themes that emerged from benchmarking. First, most TEPs outline investment and programs for three to five years, which is longer than a typical general rate case test period but is still able to accommodate major programmatic changes, as needed, in a dynamic environment. Second, TEPs generally emphasize Level 2 charging over DCFC due to the greater number of use cases, lower costs of installing Level 2 chargers compared to DCFCs and minimized grid impact to improve overall customer affordability. Six other key themes that emerged and are discussed in more detail below include 1) compliance with statewide regulations, 2) emphasis on equity, 3) focus on MUD and fleet segments, 4) a trend towards make-ready incentives as opposed to utility ownership, 5) other supporting functions, and 6) managing the incremental EV load.

From a compliance perspective, seven states have legislative or regulatory requirements to file periodic TEPs that describe their TE efforts for the next three to five years. Utilities in Colorado, Illinois, New Mexico, Oregon, and Washington are required by state legislation while utilities in Arizona and Virginia are required to submit TEPs by and to their utility commissions. In other

[10] Data for investment, program years, electric customers, and 2030 EV forecasts (rounded to nearest hundred thousand) sourced from company TEP filings. Exceptions: # Charge Ports for SCE does not include the 870 sites approved for the Charge Ready Transport medium-duty and heavy-duty vehicle program; 2030 EV forecasts for ComEd and ConEd were estimated based on state EV targets and customer size

[11] Since Q4 2022, Xcel CO has since reached a settlement agreement with its Commission, Xcel MN has since withdrawn its TEP, and National Grid has since received approval for portions of its TEP

cases, utilities have filed TEPs to align with statewide environmental initiatives including statutory EV targets.[12] The most impactful of these has been California's Zero Emission Vehicle (ZEV) program and its related regulations. The ZEV regulations have set increasingly stringent sales targets for EVs in California since 1990, with the most recent amendment to the regulations, called the Advanced Clean Cars II regulations, requiring all new passenger vehicles sold in California to be zero emissions by 2035. Fifteen other states have since adopted the program.[13] These states and California are collectively called ZEV states, and their share of national EV sales is higher than their share of the national population.[14] Accordingly, TEPs are more likely to be filed in these states than non-ZEV states. Furthermore, California and New York (two ZEV states) account for most of the $3 billion in approved utility TE investments over the last 10 years.[15]

Emphasis on equity, by supporting DACs and low- and moderate-income (LMI) residential customers, is a key theme in most TEPs. Eighty percent of TEPs reviewed in the ACEEE report address equity in some way, although the definition of the equity focus varies widely. DTEE observed 20%-40% of equity-focused investment in TEPs with the benchmarking it performed, which aligns with ACEEE's analysis. The most common way utilities are focusing their programs on equity is through enhanced program offerings for commercial customers that are located in DACs (with the definition varying by utility and state) and for residential customers that are either located in DACs or meeting an income threshold for low- and moderate-income customers. For example, National Grid proposed up to $1,000 in make-ready and charger rebates for SFHs, but customers in designated Environmental Justice Communities (EJCs) or meeting the LI threshold could receive $1,700.[16]

MUDs are receiving unique attention in most TEPs due to coordination issues between tenants and landlords. As the ACEEE report concludes, *"In general, policymakers, PUCs, and utilities see the need to direct resources toward these buildings,"* since this is an area where the competitive market is currently lacking solutions.[17] While the coordination issues are common to most MUDs, TEPs often feature increased incentives for - or additional programs limited to - MUDs located in DACs, serving LMI residents, or having some other equity focus. For example, Xcel Colorado has

[12] Utility Transportation Electrification Planning – Emerging Practices to Support EV Deployment | ACEEE
[13] Colorado, Connecticut, Delaware, Maine, Maryland, Massachusetts, Minnesota, New York, New Jersey, Nevada, Oregon, Rhode Island, Washington, Vermont, and Virginia
[14] Evaluating electric vehicle market growth across U.S. cities (theicct.org)
[15] Utility Transportation Electrification Planning – Emerging Practices to Support EV Deployment | ACEEE
[16] National Grid TEP filing; EJCs defined by the State of Massachusetts
[17] Utility Transportation Electrification Planning – Emerging Practices to Support EV Deployment | ACEEE

a utility-owned make-ready infrastructure program for MUDs and also offers a charger rebate for MUDs that meet income-qualified criteria or are located in high emissions communities.[18]

Fleets, particularly MHDVs, transit buses, and school buses, are another segment receiving unique attention, especially among larger utilities. SCE has dedicated $356 million through its Charge Ready Transport TEP to support the electrification of MHDVs by providing low- or no-cost charging infrastructure (DTEE's eFleets program similarly provides charger rebates and advisory services to support fleet electrification).[19] As with MUDs, some TEPs have equity-focused programs or enhanced incentives within their fleet offering. For example, ComEd's TEP proposal included a $120,000 rebate for electric school bus purchases, but that is increased by 50% to $180,000 for those buses serving DACs.[20]

Make-ready infrastructure programs are the most commonly offered incentive program in TEPs, and a greater share of TEP capital budgets go to these programs versus own-and-operate programs.[21] In a 2022 Midcontinent Transportation Electrification Collaborative (MTEC) analysis of all U.S. utility TE filings approved from 2012 through Q3 2022, and listed on the Atlas Public Policy EV Hub, nearly $2 billion had been approved for make-ready infrastructure programs, whereas in that same period less than $1 billion was approved for utility own-and-operate programs.[22] Consistent with this national trend, the three TEPs benchmarked by DTEE with significant capital budgets (excluding Xcel MN's withdrawn proposal) are allocating about 90% of their capital budgets towards make-ready infrastructure programs.

With regard to supporting functions, all DTEE-benchmarked utilities dedicate between 10% and 25% of their total TEP investment on other portfolio costs. These costs include marketing, education, outreach, and other program support such as IT and program administration. Utilities recognize the need to spread awareness about their programs and the benefits of EVs. Some ways that utilities are proposing to address this include expanding their websites and working with local car dealerships. An extension of these programs can also include advisory services such as call centers or dedicated people to advise customers, commonly in the fleet segment. More than half of utility TEPs offer detailed fleet advisory services including fleet assessments, which give

[18] Xcel CO TEP filing; high emissions communities are defined by Xcel CO in conjunction with stakeholders
[19] Charge Ready Transport Advances Despite Pandemic-Related Challenges and SCE Charge Ready Transport Decision
[20] ComEd TEP filing
[21] Utility Transportation Electrification Planning – Emerging Practices to Support EV Deployment | ACEEE
[22] Midcontinent Transportation Electrification Collaborative 2022 meeting

fleet operators an idea of what electrification would cost in terms of infrastructure investments and ongoing vehicle charging.[23]

Lastly, all benchmarked utilities emphasize the importance of strategically managing the incremental load from EV charging to mitigate the impacts to its grid. Most utilities have participant requirements or incentives that support managed charging or Time of Day (TOD) rates. Both methods can impact customer charging behavior by encouraging or requiring charging during off-peak hours. All utilities offer TOD rates to their residential participants and use their educational resources to encourage off-peak charging. Although all utilities recognize the importance of strategically managing the transition of additional EV load, especially as adoption increases, managed charging is still in a relatively nascent phase. Only two utility TEPs, National Grid and Xcel CO, offer an additional incentive for participants to enroll in managed charging programs. These programs are similar to DTE Smart Charge, which is currently offered and discussed in more detail in the Grid Integration sections below.[24]

3.2 Market Assessment

For the Market Assessment phase, DTEE determined the charging infrastructure required to support forecasted EV adoption in DTEE service territory. The Company's 2023 EV Registration Forecast (see Figure 1 above) is a combination of a short-term forecast constructed using recent registration data from S&P Global and a long-term forecast derived from other published industry expert forecasts. In the short-term forecast, EV registrations for 2024 and 2025 were determined using an exponential regression based on EV registrations from 2018 through 2023. Beginning in 2027, DTEE EV registrations are derived using recently published forecasts from 2022 and 2023.[25] Most of these are national EV sales forecasts that are converted to Michigan EV sales forecasts by applying a fraction which increases over time as the Company expects the Michigan EV sales rate to increase and be closer to the national EV sales rate. The Michigan EV forecast is then converted to a DTEE EV forecast by applying another factor representing the percentage of new EV registrations made in DTEE service territory. As the transitionary year between the short- and long-term forecasts, 2026 is the average of 2025 and 2027.

[23] Utility Transportation Electrification Planning – Emerging Practices to Support EV Deployment | ACEEE
[24] Utility Transportation Electrification Planning – Emerging Practices to Support EV Deployment | ACEEE
[25] Including those from Bloomberg New Energy Finance, Goldman Sachs, Electric Power Research Institute, International Council on Clean Transportation, Boston Consulting Group, and the U.S. Energy Information Administration

To evaluate charging requirements to support the EV forecast, the Company considered five primary, all-encompassing customer segments and their corresponding market needs as described in Table 4 below.

Table 4 Overview of Primary Customer Segments and Market Needs

Segment	Customer Description	Market Needs
SFHs	Residential customers in detached homes which generally have a single electrical panel (includes buildings with three or fewer housing units)	• Longer duration charging is possible, so it can be served exclusively by Level 2 chargers • Cost of installation, which can be as much as $8,000, is a barrier for LI customers
MUDs	Commercial customers with buildings that have four or more housing units. Parking may be in shared lots or designated parking spots	• Longer duration charging is possible, so it can be served exclusively by Level 2 chargers except in unique situations (e.g., no parking) • If landlords lack motivation to install chargers, it deters EV adoption for residents
Public	Commercial customers owning chargers for public use, either at a destination (e.g., stores and restaurants) or on-route near a major throughway	• In some areas, Level 2 chargers are sufficient, but majority of charging needs will be fulfilled by DCFCs in the future due to shorter charging time • In 2023, there is a lack of public charging infrastructure in disadvantaged and rural communities within DTEE service territory
Fleet	Commercial customers owning chargers for business use. Fleets can be one or more light-duty vehicles and/or MHDVs	• Type of chargers needed varies depending on type of EV, vehicle miles traveled, and parking duration(s) • Large fleet depots, particularly for MHDVs, can have high installation costs
Workplace	Commercial customers owning chargers for employee use with their personally owned vehicles	• Longer duration charging is possible, so it can be served exclusively by Level 2 chargers. Over time, workplaces may be served by DCFCs, too

Once the customer segments were established, DTEE's EV forecast was portioned out into each customer segment. The formula used to calculate the incremental number of chargers by customer segment and charger type (Level 2 or DCFC) for a given year is as follows:

$$Chargers = \frac{\frac{Number\ of\ EVs}{EVs\ per\ Charger\ Port} \times Charger\ Mix}{Ports\ per\ Charger}$$

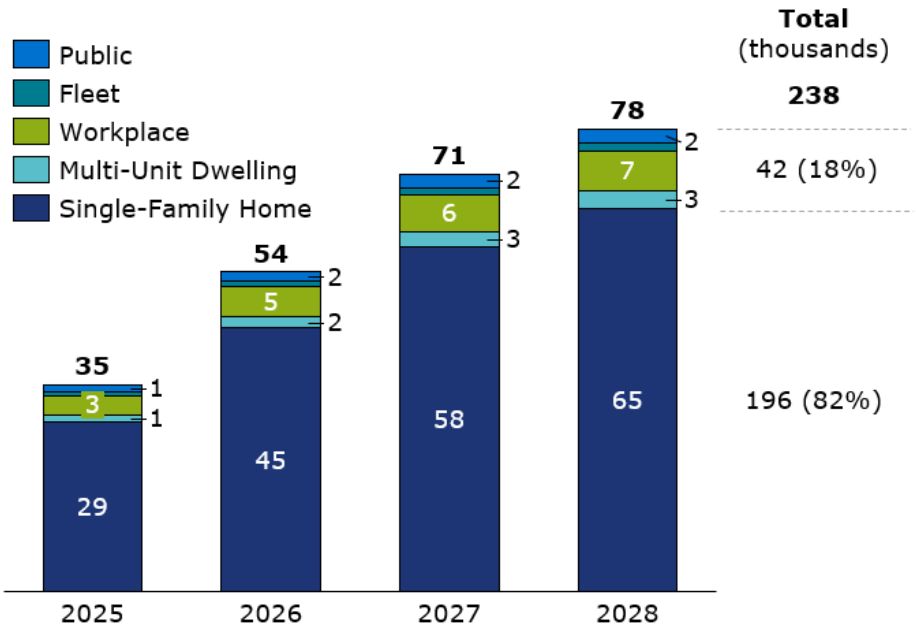
First, the incremental number of EVs forecasted that year was divided by the number of EVs served per charger port. EVs per charger port is assumed to be as low as one for SFHs and as high as approximately 200 for public on-route charging in 2028. Generally, the number of EVs per charger port increases over time, as adoption of EVs increases and chargers are utilized more efficiently.

Next, this number of ports was segmented into charger type by multiplying it by the charger mix, a percentage representing the assumed share of Level 2 or DCFC ports for that segment. Charger mix for SFHs and MUDs was assumed to be 100% Level 2 chargers since longer duration parking is expected. On the other hand, public charging was assumed to be primarily DCFCs. For fleet charging, the charger mix varies by use case and vehicle type. The Company assumed 80% Level 2 charging for light-duty vehicles, whereas it assumed 80% DCFCs for larger vehicles and 100% DCFCs for buses.

Finally, the number of chargers by customer segment was found by dividing the number of ports of each charger type by the number of ports per charger, which ranges between one and 1.3 depending on segment and year. For example, SFHs and school buses assume one port per charger, whereas public charging increases to 1.3 ports per charger in 2028.

The resulting market size estimates that approximately 238,000 incremental chargers will be needed over the four-year TEP time horizon, increasing from approximately 35,000 in 2025 to 78,000 in 2028 as shown in Figure 2 below. More than 80% of the estimated chargers needed to support forecasted EV adoption from 2025 through 2028 are projected to be at SFHs. Driven by the residential segment (both SFHs and MUDs), the majority of incremental chargers needed are Level 2 rather than DCFCs. In fact, during the TEP horizon, DCFCs make up about 2.5% of estimated incremental chargers needed. The corresponding load expected from each segment can be found in Appendix A.

Figure 2 Forecast of Incremental Chargers Needed in DTEE Service Territory (thousands)



The next step in the market assessment was to quantify the associated investment required to install the chargers needed. DTEE used Company data and considered the following factors in developing its cost assumptions by charger segment and type:

- Inflation of 5% for 2023 and 2% thereafter,
- Charger costs decreasing 3% each year due to expected technology advancement, and
- Economies of scale by assuming for each increase in scope of two chargers, charger costs were reduced by 2% and installation costs were reduced by 5% for Level 2 chargers and 10% for DCFCs, with no additional benefit after 10 chargers.

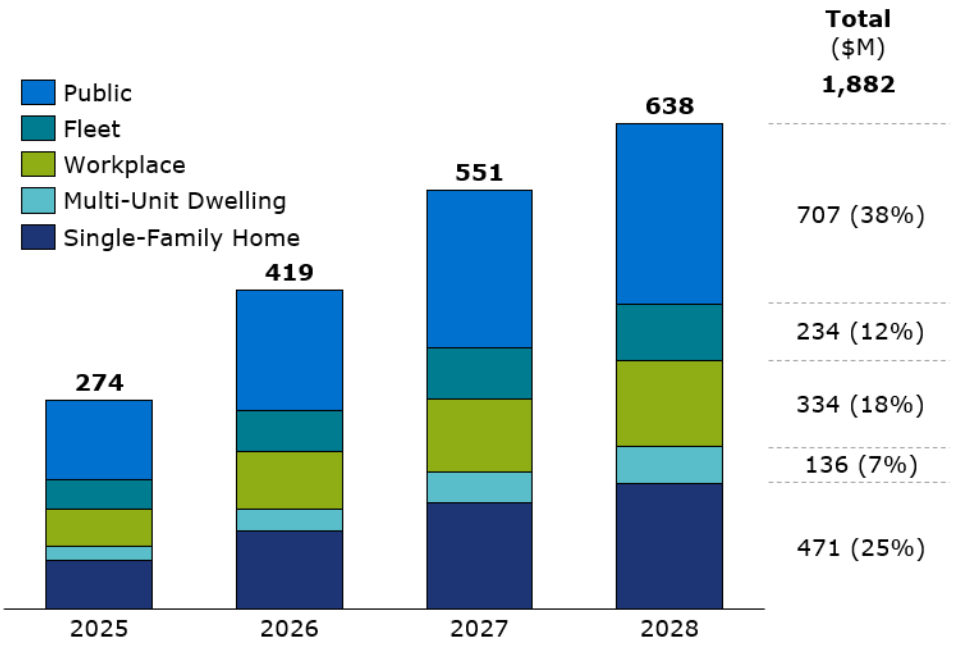
The effect of those factors on the cost assumptions is that charger and installation costs decline as the number of chargers per location increases, whereas charger costs decline and installation costs increase over time for a fixed number of chargers per installation. Finally, after reviewing internal project data, DTEE estimated that 20% of fleet installations and 75% of workplace installations did not require any service upgrades, so the utility make-ready (UMR) costs for those segments were reduced accordingly. For SFHs, it was also observed that the average customer make-ready (CMR) cost for “newer” buildings (built in 1980 or after) is about half the average CMR cost for “older” buildings (built before 1980). Similarly, DTEE estimated that newer SFHs would experience a delay on the kinds of UMR costs that older SFHs typically incur today. This is because newer neighborhoods typically have fewer homes per transformer, and so those areas

can accommodate low numbers of Level 2 EV chargers without requiring transformer upgrades, unlike older neighborhoods. The description and examples of UMR, CMR, and charger costs are included in Table 7 below, and the average cost assumptions by cost category can be found in Appendix B.

The resulting investment required for charger installation (including charger costs) is nearly $1.9 billion from 2025 through 2028, increasing from approximately $274 million to $638 million, respectively, as shown in Figure 3 below. Even though public charging represents just 3% of chargers needed (see Figure 2 above), it is the largest driver of investment required in the near-term at nearly 40% due to the high costs of DCFCs and their associated installation. Conversely, although SFH chargers are over 80% of total projected chargers, they only require about 25% of total investment since Level 2 chargers and installations at SFHs are much less expensive.

This total infrastructure investment will ultimately need to be funded by a mix of public, private, government, and utility sources, with the TEP Portfolio and Distribution Grid Planning sections below detailing DTEE's proposed and estimated investment from the utility. The $1.9 billion investment described above does not include transmission costs or power supply costs. In accordance with the 2022 Integrated Resource Plan (IRP), which was approved with a settlement agreement in July 2023, the Company does not project a generation capacity need through 2027.

Figure 3 Annual Investment Required for Charging Infrastructure in DTEE Service Territory by Customer Segment ($ millions)



3.3 Stakeholder Engagement

DTEE engages a variety of stakeholders for its current Charging Forward programs, including hosting annual stakeholder discussions, distributing high-level quarterly reports, and publishing detailed annual status reports. Continuing to work closely with stakeholders during TEP development and execution is helpful to ensure a balanced, well-aligned plan for the State of Michigan. DTEE considered that the scale of the TEP could be larger than prior Charging Forward proposals, and accordingly, the Company scaled up its stakeholder engagement efforts in the development phase. First, DTEE expanded its outreach to over 100 organizations that could be impacted by the TEP and organized these into three key stakeholder groups: EV industry, customer-facing organizations, and policy & advocacy groups. Types of organizations in those key stakeholder groupings are shown in Table 5 below.

Table 5 Types of Organizations in the Three Key Stakeholder Groups

EV Industry	Customer-Facing	Policy & Advocacy
• Auto manufacturers • Charger manufacturers • Network providers • Charger installation companies	• Municipalities • Regional planning organizations • Transit agencies • Businesses • Gas and convenience store owners • Rental car companies • Transportation Network Companies	• MPSC • Regional advocacy groups • National advocacy groups

To ensure its TEP balances the diverse interests of these parties, DTEE pursued a stakeholder engagement initiative aimed at providing transparency and obtaining feedback on the overall approach and development phases through a series of webinars and surveys. This initiative included:

- Consultation with the MPSC,
- A kick-off webinar with all organizations to explain the TEP approach, discuss the guiding principles, and request their engagement,
- Three separate meetings, by stakeholder group, covering the same content – market assessment, customer segmentation, and charger installation cost categories – to ask key questions and gain insight into stakeholder positions,
- A preview webinar with all organizations to get feedback on the preliminary proposal before finalizing the TEP,

- Four surveys, following the stakeholder group discussions, to allow space for additional feedback and make improvements in the content and process as applicable,
- A targeted BCA conversation with a subset of stakeholders to review the Company's methodology and achieve consensus where possible,[26] and
- Individual follow-up meetings with organizations as requested.

In total, DTEE invited 110 organizations to engage in this process with about half, or 54, participating and about half of the participants were from the EV Industry stakeholder group. A full list of participating organizations can be found in Appendix C.

The stakeholder engagement process provided valuable feedback, that was mostly aligned as evidenced by the following areas of general consensus:

- There is a need to provide charging rebates to facilitate the EV market in the near-term,
- Utility TEPs should have a strong focus on MUDs, LI customers, and DACs,
- The resulting plan should have a robust BCA that provides net affordability benefits to all customers at the portfolio level, and
- In parallel, DTEE should focus on grid modernization and streamlining interconnection timelines to improve reliability and the customer experience.

Identifying those areas of alignment provided the foundation upon which DTEE built the TEP. It was also helpful to identify areas of divergent opinions, which included the following differing positions:

- Utility ownership of chargers for specific use cases such as curbside Level 2 charging and rural fast charging versus utility ownership should be minimized and only as a last resort,
- There are clear market failures in the EV charger market today versus it is premature in the relatively new EV charger market to claim a market failure,
- Utilities should waive customer-owed contribution in aid of construction (CIAC) for utility make-ready costs for charger installation versus cost causation principles of rate design (and appropriate credits based on expected load and revenue) should remain in place for new service requests or upgrades, and

[26] Stakeholders for the benefit-cost analysis discussion included 5 Lakes Energy and MPSC Staff

- The output from the TEP market assessment for the number of chargers forecasted should align with the MI Healthy Climate Plan's aspirational EV target of two million EVs by 2030 versus aligning with DTEE's EV forecast.[27]

The biggest impact divergent opinions had on the TEP was to not include utility-owned charging with this initial TEP. Specifically, DTEE initially considered but ultimately decided not to propose utility-owned pole-mounted chargers in an effort to achieve consensus where possible. Although the Company believes there is merit in that offering due to lower costs, opportunity to seek federal funding at scale, and ability to provide more affordable overnight charging solutions for DACs and MUDs, there is not clear alignment across all stakeholders. Additionally, to ensure positive rate impact and affordability benefits accruing to all customers, DTEE also decided 1) not to waive CIAC beyond revenue credits from the existing line extension policy and 2) to use its EV forecast based on industry experts to determine near-term charging needs.

The Company gave a preview of proposed TEP programs to stakeholders in October 2023 and sent a survey to participants following the discussion. Stakeholder sentiment on the specific TEP proposals is provided throughout the rest of this report, as applicable. Overall, surveyed stakeholders overwhelmingly indicated DTEE's engagement approach met expectations, with 83% of surveyed organizations stating they were either "satisfied" or "very satisfied," with the balance stating they were "neutral." Sample verbatims provided by survey respondents include:

- *"Clear communication of different elements of plan. Data points shared were really helpful,"*
- *"It provided ample opportunity for feedback on DTE's proposed TEP plans,"* and
- *"I have a better understanding of DTE's intent to support light-duty EV charging. Industry stakeholders were given lots of opportunity to comment, and the comments were noted and seemed appreciated."*

3.4 Participation Framework

To begin exploring how the Company could best support the charging market while following its guiding principles, the five primary customer segments in the Market Assessment section above were further divided into sub-segments as described in Table 6 below. This allowed DTEE to examine the varying needs and market dynamics at a more granular level to appropriately determine the degree to which it should participate.

[27] MI Healthy Climate Plan

Table 6 Overview of Customer Sub-Segments

Segment	Customer Sub-Segments	Description of Location or Use Case
SFHs	LI	Level 2 chargers for SFH residents within 200% of federal poverty limit
	Non-LI	All other Level 2 chargers at SFHs
MUDs	LI	Level 2 chargers at affordable MUD housing (e.g., public housing, government-subsidized private housing, etc.)
	Non-LI	All other Level 2 chargers for MUDs
Public	DAC/rural on-route DCFCs	DCFCs within one mile of a major throughway and in DACs and/or rural areas
	All other on-route DCFCs	All other DCFCs within one mile of a major throughway
	Destination DCFCs	All DCFCs further than one mile from a major throughway
	Destination Level 2	All Level 2 public charging, including pole-mounted charging
Fleet	Transit agencies	DCFCs serving transit buses
	Schools	DCFCs serving school buses
	Level 2	Level 2 charging for fleet EVs, typically light-duty vehicles
	All other DCFCs	All other DCFCs for fleet EVs
Workplace	-	Chargers for employee use with personally owned vehicles

Another dimension to consider for providing charging market support are the three primary cost categories for charger installation: UMR, CMR, and EV Charger. Definitions and specific examples for these three cost categories are provided in Table 7 below.

Table 7 Charger Installation Cost Category Definitions and Examples

	Utility Make-Ready	Customer Make-Ready	EV Charger
Description	• Upgrades on the utility side of the meter, from the line transformer to the meter	• Upgrades on the customer side of the meter, from after the meter to the EV charger stub out	• Hardware required to charge the EV
Examples	• Grid edge infrastructure (e.g., pole top transformer) needs to be upgraded to support residential EV load • Another service line needs to be added to support EV chargers in a parking lot	• A residential customer installs a larger panel to support an EV Charger • A commercial customer installs conduit and cable from the panel to the charger stub out	• Level 2 chargers • DCFCs

The ways in which DTEE ultimately decided to support the above customer subsegments and justification for its proposals are included in the following TEP Portfolio sections.

4 TEP Portfolio

4.1 Single-Family Homes

Based on DTEE's market assessment discussed above, SFH chargers are expected to be over 80% of the chargers needed between 2025 to 2028 and about 60% of EV-specific load. Access to charging at home facilitates EV adoption as it unlocks fuel pricing of close to $1 eGallon equivalent.[28] While the average total installation cost of $2,400 is lower than other segments,[29] the range varies widely. For example, from over 600 completed jobs in the Company's Home Charger Installation pilot, the total cost of installation (including the charger) ranged from as low as $750 to as high as $7,850. Customers can face high installation costs due to outdated electrical wiring and/or breaker panels.

The Company has offered a $500 Home Charger Rebate since the launch of Charging Forward in June 2019. From 2020-2022, there were about 21,340 new EVs registered in DTEE service territory, and 2,160 Home Charger Rebates processed (or 10% of new EVs). While over 80% of the chargers needed between 2025 and 2028 are expected to be in SFHs, the Company and stakeholders believe that EV adoption in the non-LI sub-segment is unlikely to be solely

[28] Using the eGallon-methodology-final (energy.gov) and assuming 28.2 miles/gallon, 0.31 kilowatt-hours/mile, and 13.2 cents/kilowatt-hour off-peak pricing
[29] See Appendix B

determined by the cost to install a home charger. However, this can be a significant barrier for LI customers. Therefore, with the TEP guiding principles in mind, the Company is proposing to increase the size of the incentive to cover the full cost of installation and focus it on only on LI customers that most need installation support and fuel savings to switch to an EV. As stated by one of DTEE's key stakeholders in a feedback webinar, *"[the LI] community needs resources to move to EV adoption. This segment cannot be left behind."*

Initially, the Company proposed a LMI customer eligibility threshold of 400% of the federal poverty limit, but this was considered to be too high by some stakeholders. Consequently, DTEE lowered the income eligibility threshold to 200% of the federal poverty limit, which aligns with the threshold for other DTE LI programs and would be approximately $60,000 for a four-person household.[30] DTEE estimates that 4% of forecasted EV sales during the TEP timeframe would be made to residential customers that meet this threshold. Other qualification requirements would be proof of EV purchase or lease, installation of an ENERGY-STAR certified or vehicle manufacturer charger less than or equal to 12 kilowatts (kW), and enrollment in a Time of Day (TOD) rate with more meaningful differentials.[31] DTEE is proposing to support 100% of the LI SFH sub-segment over the TEP timeframe, which amounts to approximately 10,900 rebates for a total of $24.0 million.[32]

There are two additional considerations worth noting for the SFH segment of the TEP. First, the income eligibility threshold is critical to monitor and adjust based on market dynamics of EV adoption. For example, if the upfront premium for EVs continues to remain high, then DTEE may need to adjust the threshold upwards to meaningfully encourage EV adoption in Southeast Michigan. Second, the Company still intends to educate all customers, regardless of income, on available TOD pricing to encourage off-peak charging as part of its continued E&O described in more detail below.

4.2 Multi-Unit Dwellings

As discussed in the benchmarking section above, MUDs are receiving unique attention in other utility TEPs. *"MUDs, in particular, are seen as an area in need of major investment given their greater challenges than single-family homes and the fact that most charging is expected to occur at home."*[33] MUD charging is challenging because landlords often lack the incentive to install EV

[30] E.g., DTE Energy Efficiency Assistance Program and DTE Shutoff Protection Plan; Poverty Guidelines | ASPE (hhs.gov)
[31] Such as Whole-Home TOD (D1.2), Dynamic Peak Pricing (D1.8), EV-only TOD (D1.9), or recently-approved Overnight Savers (D1.13)
[32] Assuming an average rebate of approximately $2,200 (would not exceed actual costs); difference to total cost from Appendix B due to average $200 of utility make-ready cost funded by the utility (business as usual)
[33] Utility Transportation Electrification Planning – Emerging Practices to Support EV Deployment | ACEEE

chargers, which creates a purchase barrier for tenants without access to affordable, overnight charging. The average total cost of installation is approximately $15,550 per charger installation over the TEP timeframe, driven by customer make-ready costs, which often require trenching and extending electrical wires to parking areas.[34] As of October 2023, only about 250 Business Charger Rebates have been approved for MUDs, compared to over 4,400 Home Charger Rebates approved. MUDs represent only about 5% of approved rebates for charging at home, but the Company estimates approximately 20% of its customers live in MUDs. Based on that Charging Forward data, benchmarking other TEPs, and stakeholder consensus for utility support in the MUD segment (as discussed in the Stakeholder Engagement section above), the Company is proposing support for both sub-segments of MUDs.

For LI MUD housing, DTEE is proposing to rebate the full cost of Level 2 installation. Surveyed stakeholders ranked this as the fourth most important sub-segment for utility action, following three public charging sub-segments. MUDs that qualify would be those that either 1) are owned and managed by a public entity such as the Housing Commission, 2) receive government subsidization such as the LI Housing Tax Credit, or 3) have at least 40% of their residents participating in the Housing Voucher Program. DTEE estimates that 6% of estimated MUD charger deployments would qualify during the TEP timeframe. To reduce the risk of stranded assets, MUDs will need to demonstrate tenant interest. Additionally, DTEE intends to proactively target MUDs where ride-hailing drivers live by working closely with transportation network companies. The Company is proposing to support 90% of the LI MUD sub-segment over the TEP timeframe, which amounts to approximately 485 rebates for a total of $7.0 million.[35]

For all other MUDs, landlords may have some incentive to install chargers as an amenity to attract tenants, retain occupancy, and/or raise rent. However, coordination issues can still exist between tenants and landlords, so the Company is proposing to continue and increase its current fixed Business Charger Rebate for other MUDs from $2,000 to $5,000 per Level 2 charger, since MUD participation in Charging Forward is currently low. To manage overall TEP investment levels, DTEE is proposing to support 45% of this sub-segment over the TEP timeframe, which amounts to 4,130 rebates for a total of $20.7 million.

Participating customers for both sub-segments would need to install a qualified, networked charger (similar to Business Charger Rebates today), share data, and commit to 97% uptime,

[34] See Appendix B for cost category breakdown
[35] Assuming an average rebate of approximately $14,400 (would not exceed actual costs); difference to total cost from Appendix B due to average $1,150 of utility make-ready cost funded by the utility (business as usual)

affordable usage fees, and DTEE outreach for future managed charging programs. The Company is not intending to allow rebates for DCFCs at MUDs except in special cases (e.g., extremely limited parking for residents). Level 2 charging is appropriate for the longer parking duration at MUDs, enables more fuel savings for tenants, and minimizes impacts to the DTEE grid. A minority of stakeholders surveyed indicated that supporting almost 100% of the anticipated LI MUD market was too much, and the same portion of stakeholders responded that DTEE was not supporting enough of the non-LI MUD market. These results may reflect uncertainty in the LI MUD market, so flexibility to adjust the LI MUD housing qualifications and rebate amounts based on market demand will be critical to successfully enable MUD resident EV adoption during the TEP timeframe.

4.3 Public Charging

As described in the Market Assessment section above, public charging represents the highest category of investment required over the TEP timeframe at nearly 40%, driven by the high cost of installation of DCFCs due to high-voltage wiring and more expensive hardware. Public charging sub-segments all ranked as the most important for utility action among surveyed stakeholders, because its availability is critical to reduce range anxiety – a key barrier to EV adoption – and increase customers' confidence in the refueling infrastructure. Reliable, on-route fast charging best addresses range anxiety, so DTEE is proposing to direct its rebates in the public segment to on-route DCFCs, defined as fast charging within one mile of a major throughway exit.

The on-route DCFC segment is receiving investment from other sources as well. In addition to the $7.5 billion dedicated to public charging infrastructure in the Bipartisan Infrastructure Law, auto manufacturers and others are investing heavily in public fast charging, too. For example:

- Tesla has one of the most widespread and recognizable fast charging networks in the nation, and nearly all automakers (OEMs) have recently announced adoption of their North American Charging Standard connector going forward,
- Seven other OEMs have announced a $1 billion joint venture to deploy 30,000 DCFCs across the U.S. and Canada by 2030,[36] and
- BP Pulse announced plans to invest $1 billion in EV charging infrastructure by 2030.[37]

Investment from all three sources of funding – government, private market, and utility – is needed to build out the charging infrastructure needed to support forecasted EV adoption. However,

[36] G.M. and Other Automakers Will Build 30,000 Electric Vehicle Chargers - The New York Times (nytimes.com)
[37] bp boosts EV charging network with $100 million order of Tesla ultra-fast chargers | News and insights | Home

investment from the private sector in public charging infrastructure tends to concentrate in higher-income areas that have high EV adoption rates as site hosts seek higher utilization rates. Therefore, DTEE is proposing to provide increased support for on-route fast charging in DACs and rural areas, offering a rebate of $70,000 per DCFC for qualified on-route areas and $50,000 per DCFC for other on-route areas. A community would qualify as "disadvantaged" if identified as such by the Michigan State Plan for EV Infrastructure Deployment or as "rural" with population less than 50,000, as viewed on the U.S. Department of Transportation Rural Eligibility Map. To manage affordability impacts of the TEP, DTEE is capping support at 35% of the estimated market, or about 310 on-route rebates for DAC/rural areas and another 310 rebates for other areas, for a total investment of $21.6 million and $15.4 million, respectively.

Participating customers would need to install a qualified, networked charger (similar to Business Charger Rebates today), share data, and commit to 97% uptime, in addition to other terms and conditions that will be designed to help facilitate both a positive customer experience and minimize risk of stranded investment. Rather than focusing only on DAC/rural areas, the Company is proposing to continue offering rebates for on-route DCFCs that are not in DAC/rural areas, based on stakeholder feedback in the development phase. Stakeholders consider utility support in this area critical in the near-term to both decrease range anxiety and complement available federal funding opportunities such as the NEVI program.

DTEE is not proposing rebates for public destination charging. For site hosts wanting to install a destination DCFC, DTEE will continue to offer a commercially available rate without demand charges for sites less than one megawatt.[38] For site hosts wanting to install destination Level 2 chargers, the economics of Level 2 charger deployment are not as challenging, and businesses have other motivation for installation, absent rebates (e.g., increased foot traffic). As with other segments, flexibility to adjust rebate amounts and qualification criteria based on market signals will be important to build a foundational charging network in Southeast Michigan and effectively reduce range anxiety.

4.4 Fleet Charging

Total cost of ownership is a key driver for fleet conversion, with light-duty fleet vehicles offering the most compelling economics over the TEP timeframe. Similar to MUDs, fleet charging is

[38] General Service Rate D3 in the THE DETROIT EDISON COMPANY (michigan.gov) rate book; sites over one megawatt also qualify through June 2026

another area of focus in most utility TEPs as discussed in the Benchmarking section above. Accordingly, the Company is proposing support across all sub-segments of fleet charging.

Mass transit and school bus electrification have received unique attention in governmental policy and funding programs due to community benefits. In particular, transit bus emissions disproportionally impact DACs. Even with funding sources available, additional support is often needed to further improve the economics due to the upfront premium of electric buses. DTEE stakeholders agree and ranked it in the top half of sub-segments that are important for utility action (following public charging and LI MUDs). Therefore, the Company is proposing to continue its eFleet Charger Rebate for both school and transit buses of $70,000 per DCFC, assuming 60kW and 150kW DCFCs for those sub-segments, respectively. Although school bus chargers are less expensive, on average, than transit bus chargers, schools require more incentive to convert since they are lower mileage and do not achieve the same level of fuel savings to offset the upfront premium. The Company is proposing to support both mass transit and school bus customer sub-segments, but at different levels. This is to balance affordability impacts to the TEP overall and to allow for existing private market solutions to grow. DTEE is proposing to support 100% of the mass transit sub-segment over the TEP timeframe. This is because the transit bus market currently lacks private market solutions to encourage bus electrification, and as discussed in the Benefit-Cost Analysis section below, high utilization rates in this sub-segment lead to positive affordability impacts. This amounts to approximately 33 rebates for a total of $2.3 million.[39] To manage affordability impacts of the TEP (because of lower utilization rates) and to allow the growing number of private market solutions for school bus chargers to continue to evolve, DTEE is capping support at 30% of the estimated school sub-segment, or about 100 rebates for a total investment of $7.0 million.

The Company is proposing both Level 2 and DCFC support for other fleet vehicles that are not school or mass transit buses. These other fleets may be owned by a government body or a private business, and may have light-, medium-, or heavy-duty vehicles. Encouraging Level 2 charging for other fleets improves the total cost of ownership economics for fleet owners while also reducing grid impacts and supporting affordability for DTEE customers overall. As a result, DTEE is proposing to continue offering a $2,500 eFleet Charger Rebate for 90% of the other fleet Level 2 sub-segment, which is estimated to be about 2,735 rebates over the TEP timeframe for a total of $6.8 million. Since fleet electrification can generally benefit DTEE customers overall with high,

[39] Assuming 1.6 buses per charger

stable utilization, the Company is also proposing to continue offering eFleet Charger Rebates up to $70,000 for DCFCs but capping participation at 30% of the expected market to manage overall TEP investment levels. This is expected to be about 285 rebates over the TEP timeframe for a total of $20.0 million.

Participating fleet customers would need to install a qualified, networked charger (similar to eFleet Charger Rebates today), share data, agree to load commitments, and commit to demand ceilings in constrained areas or for large depots to manage grid impacts. Additionally, schools would have to install vehicle-to-grid (V2G) chargers to be eligible for the full $70,000 rebate.

4.5 Portfolio Summary

The proposed TEP programs achieve DTEE's guiding principles by facilitating charger deployment while maintaining affordability benefits for all DTEE customers at the portfolio level, closing charging gaps and improving economics of electrification in the near-term, and promoting equity with a focus on LI customers and DACs. The portfolio is summarized in Table 8 below:

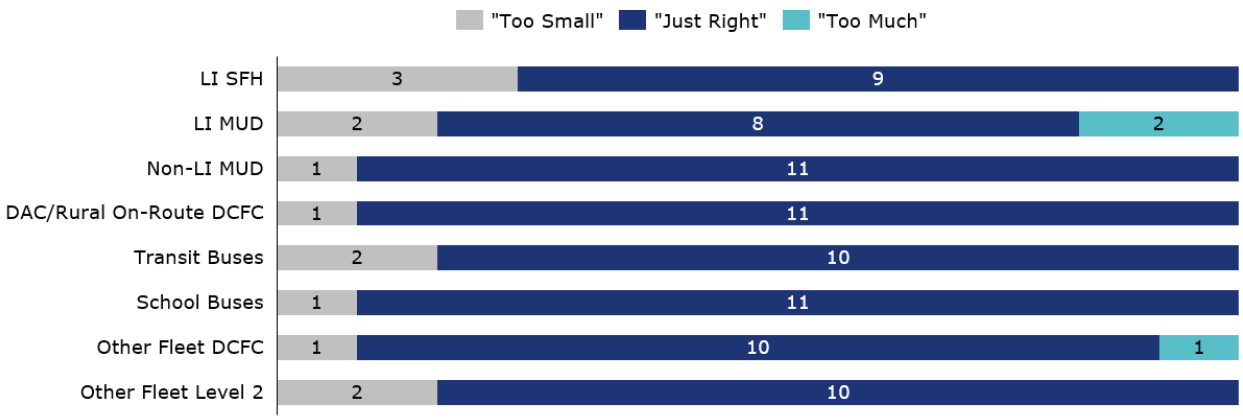
Table 8 Proposed TEP Rebate Programs, 2025-2028

Customer Segment	Customer Sub-Segments	Rebate[40]	No. of Rebates	Share of Market	Total Investment (M)
Single-Family Homes	LI Level 2	$2,200	10,900	100%	$24.0
Multi-Unit Dwellings	LI Level 2	$14,400	485	90%	$7.0
	Non-LI Level 2	$5,000	4,130	45%	$20.7
Public	DAC/rural on-route DCFC	$70,000	310	35%	$21.6
	All other on-route DCFC	$50,000	310	35%	$15.4
Fleet	Transit bus DCFC	$70,000	33	100%	$2.3
	School bus DCFC	$70,000	100	30%	$7.0
	Other DCFC	$70,000	285	30%	$20.0
	Level 2	$2,500	2,735	90%	$6.8
			Total Rebate Investment		**$124.8**

[40] LI SFH and LI MUD are average estimates based on total installation costs and would not exceed actual costs

This portfolio supports approximately 18,250 Level 2 charger ports and 1,040 DCFCs. On-route charging makes up the biggest category of investment at 30%, followed closely by fleet at 29%, MUDs at 22%, and SFHs at 19%. Stakeholder survey respondents overwhelmingly selected that the proposed rebate amounts are "just right" as shown in Figure 4 below. In the two sub-segments where some respondents thought the proposed incentive is "too much," the same number of respondents thought the proposed incentive was "too small." In fact, all the sub-segments had at least one respondent consider the incentive to be "too small."

Figure 4 Survey Responses to Proposed Rebate Amounts by Sub-Segment[41]



The TEP programs through 2028 are strategically focused on enabling a foundational charging network while leveraging other available sources of funding. As such, several elements of DTEE's current EV programs are not proposed to be included in the TEP portfolio. As discussed in sections Single-Family Homes and Public Charging above, the current TEP proposal is not supporting non-LI SFHs or any public destination charging. DTEE is also not supporting workplace charging as it is focusing on MUD charging instead. Additionally, Electric Choice customers would no longer receive a full rebate for programs they participate in and would instead receive a discounted rebate of about 35% (e.g., up to $25,000 versus $70,000 per charger) to account for the lower amount of revenue received and to maintain affordability benefits for all DTEE customers. Lastly, the TEP does not include current Charging Forward pilots such as DTE-owned Charging Hubs, Business Charger Installation, eFleet Battery Support, or EV Rebate, beyond what is already approved through 2024. While DTEE is confident in the makeup of its

[41] The 12 survey respondents included representatives from BorgWarner, BP Pulse, ChargerHelp, EV Connect, Flo EV Charging, General Motors, Michigan Auto Dealers Association, Michigan Energy Innovation Business Council (MEIBC), Michigan Public Service Commission, Southeast Michigan Council of Governments (SEMCOG), Tesla, and University of Michigan; note "all other on-route DCFC" is missing from the survey as it was added after the webinar based on stakeholder feedback

initial TEP portfolio, maintaining flexibility to adjust TEP programs to market dynamics within MPSC-approved investment limits – while maintaining affordability at the portfolio level – will be critical to success.

5 Grid Integration

5.1 Distribution Grid Planning

To meet changing needs of customers – including adoption of EVs – and to continue improving reliability, DTEE must strengthen, modernize, and transform the grid. DTEE has developed a vision for the future of the grid that is driven by three essential goals:

- Increased reliability and resilience during extreme weather to ensure that power stays on for customers during ice, snow, heat, and high wind events,
- Accelerated response to customer outages, driven by a smart grid that supports faster power restorations, identification and de-energization of downed wires, and accurate customer restoration estimates, and
- Increased grid capacity that accommodates the changing current and future energy needs of all customers.

DTEE's 2023 Distribution Grid Plan (DGP) was published in September 2023 and developed to meet these goals. More specifically, to provide safe, reliable, affordable, cleaner, and accessible electricity, the Company's four investment pillars of the DGP are Tree Trimming, Infrastructure Resilience and Hardening, Infrastructure Redesign and Modernization, and Technology and Automation. In particular, the Infrastructure Redesign and Modernization pillar supports EV adoption by focusing on converting the 4.8 kilovolt (kV) system to a more modern 13.2kV system, which will improve safety and reliability while providing additional capacity. An investment of more than $500 million into the subtransmission system over the next five years will also eliminate many system loading constraints. In total, DTEE plans to invest an additional $9 billion over the next five years to make it more reliable for customers.

The DGP considers various electrification scenarios to understand and prepare for corresponding grid impacts. Regardless of the rate of adoption, the impacts of TE will first emerge on "grid edge" assets, defined as assets nearest to the customer's service site, such as distribution transformers, secondary lines, service drops, and underground residential distribution loops. This is due, in part, to the established trend of EV adoption occurring first as clusters in neighborhoods or on a portion of a circuit. To prepare for this, the Company is already considering proactive upgrades to grid

edge equipment before equipment overloads and failures occur. Examples include replacing service lines, increasing distribution transformer sizes, and adding transformers to allow for fewer customers with higher loads per transformer. To better understand the impacts of new technology adoption (e.g., all forms of electrification, distributed generation, and battery storage) on the grid in the future, DTEE is working on building an hourly forecasting framework to integrate changing load patterns of new technologies into its forecasting and distribution planning work. This work includes utilizing machine-learning algorithms to identify where EV charging is occurring on the system and building propensity models to predict where and when future adoption of new technologies will occur. The results will enable DTEE engineering teams to identify locations on the grid where load relief investments are likely needed.

In addition to load relief investments – and regardless of any TEP charger deployment incentives ultimately approved by the MPSC – DTEE customers are expected to increasingly request new or upgraded service connections to install chargers. Based on historical work order analysis and other industry research, approximately $189 million of distribution investment will be needed for utility make-ready work to connect the chargers required to support EV adoption from 2024 through 2028 (the DGP investment timeframe). From this same analysis, DTEE estimates that it will be responsible for approximately 85% of that investment cost following DTEE tariff and line extension policy, and the balance will come from customers' contribution in aid of construction. DTEE will continue to monitor EV market signposts for incorporation into future DGP scenarios and new customer connection budgeting.

5.2 Summary of EV Managed Charging Efforts

Just as distribution system investment is critical to prepare for widespread EV adoption, managed charging programs are a key lever to maximize utilization of the grid and minimize costs of added EV load for customers. EV load is unique in that is relatively flexible for certain segments. For example, the average daily commute is about 30 miles for a residential customer, but BEVs today have an average electric range of over 250 miles.[42] Encouraging EV charging during off-peak windows allows for higher utilization of generation and electric grid infrastructure, which effectively spreads system fixed costs over increased sales, putting downward pressure on rates. From the Smart Electric Power Alliance report The State of Bidirectional Charging in 2023, *"Managed charging is an umbrella term for the implementation of any passive or active strategy that optimizes EV charging."* It can include everything from incentivizing off-peak charging with TOD

[42] Average daily commute is assuming 11,000 annual vehicle miles traveled; Average electric range sourced from Electric Power Research Institute (EPRI) Consumer Guide to Electric Vehicles (September 2023)

electric rates to using EVs as a grid resource with bidirectional charging. To date, DTEE's managed charging efforts have primarily included incentivizing off-peak charging and implementing its demand response pilot, DTE Smart Charge.

The Company's passive managed charging efforts to date are primarily promoting DTEE TOD rates to encourage off-peak charging, a key goal of Charging Forward's Education & Outreach efforts since launch. The Company offers four residential TOD rates with more meaningful on-peak to off-peak price differentials:

- D1.2 two-tier enhanced TOD rate with weekday on-peak hours of 11 am – 7 pm,
- D1.8 three-tier dynamic peak pricing rate with weekday on-peak hours of 3 pm – 7 pm,
- D1.9 two-tier EV-only TOD rate with weekday on-peak hours of 9 am – 11 pm,[43] and
- D1.13 three-tier overnight savers rate with weekday on-peak hours of 3 pm – 7 pm, which was just recently approved with Case No. U-21297 in December 2023.

Customers need to enroll in one of the above rates to qualify for DTEE's Home Charger Rebate, and D1.2 continues to be the most popular choice with 44% of participants, followed by D1.9 at 31% and D1.8 at 25%. As of Charging Forward's most recent Annual Status Report, 92% of charging took place outside the coincident peak window of 3 pm – 7 pm.[44] Upon application submission, 84% of customers stated the Home Charger Rebate "Somewhat" or "Very Much" influenced their decision to sign up for one of the required TOD rates, demonstrating that Home Charger Rebates has successfully shifted EV load – and, for whole-home rates, some non-EV load – off-peak. Starting in March 2023, DTEE converted its residential customers from rate schedule D1 (residential service rate) to rate schedule D1.11 (standard TOD), which has weekday on-peak hours of 3 pm – 7 pm. The Company is narrowing focus of the Home Charger Rebates to LI customers as described above since 1) all residential customers now have a TOD component on their rate and 2) the Company intends to continue to promote the TOD rates with more meaningful differentials – and fuel savings benefits – as part of its E&O efforts.

Another passive managed charging effort was DTEE's Bring Your Own Charger (BYOC) pilot in partnership with Sagewell from July 2020 to December 2022. BYOC used Sagewell's SageSight meter analytics software and EV Finder algorithm to incentivize off-peak charging compliance, with participants eligible to receive up to $24 per quarter. The pilot had over 510 residential customers (who were not already on a TOD rate) with 96% of charging outside the coincident

[43] D1.9 requires installation of a second meter, and the 5,000 cap for this rate is expected to be reached in 2024
[44] Charging Forward 2023 Annual Status Report

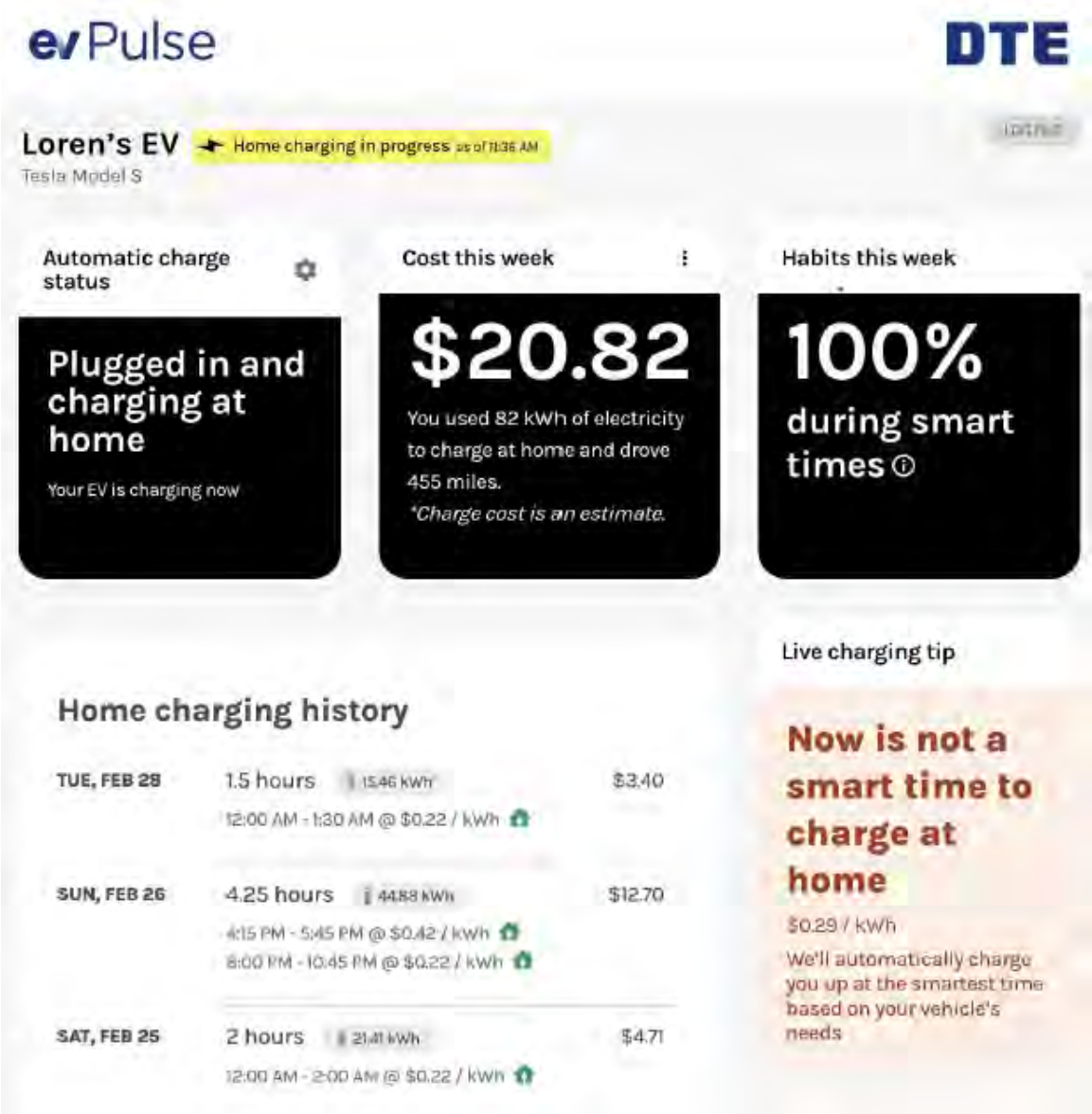
peak window of 3 pm – 7 pm. Although successful at shifting load, DTEE decided to end the BYOC pilot for two main reasons. First, Tesla chargers – the primary target for BYOC – became eligible for the Home Charger Rebate in March 2022. Additionally, all residential rates now have a TOD component, as discussed above.

For active managed charging, the Company continues to evolve its demand response program DTE Smart Charge, which utilizes vehicle telematics via the Open Vehicle-Grid Integration Platform (OVGIP) developed by the Electric Power Research Institute (EPRI), Sumitomo, and OEMs. DTE Smart Charge first launched in 2019 and is designed to help EV drivers manage their charging to occur during the most optimal times of day for grid operation. DTEE coordinates directly with participating OEMs to schedule daily charging to meet drivers' needs while allowing for interruptions to EV charging during periods of the grid's peak energy usage. The first phase of the pilot concluded after six months in August 2019 after calling 12 events with approximately 165 Ford and General Motors (GM) employee EV drivers. The second phase of the pilot expanded beyond automotive employees to any Ford and GM drivers in the Company's service territory, increasing to 370 participants. DTEE dispatched 31 demand response events for the eight months ending December 2021, resulting in 1.7 MWh of avoided energy consumption during called events – enough energy to power an average Michigan home for nearly 60 days. In May 2022, BMW joined the next phase with Ford and GM, which grew to 663 participants and called 46 demand response events over the 12-month period ending May 2023.[45] The current phase of DTE Smart Charge evolved to include Tesla in partnership with WeaveGrid, began in June 2023, and is scheduled to go through December 2024. In this phase, the Company is rolling out a managed charging approach that ties the enrollment of each participant to their specific off-peak rate schedule and only initiates charging when it's cheapest for them and most beneficial to the system.

In addition to including Tesla in DTE Smart Charge, the Company is also working with WeaveGrid on its EV Data Sharing pilot, which uses vehicle telematics data from eligible, enrolled customers in conjunction with their electric rate to obtain insights like those shown in Figure 5 below.[46]

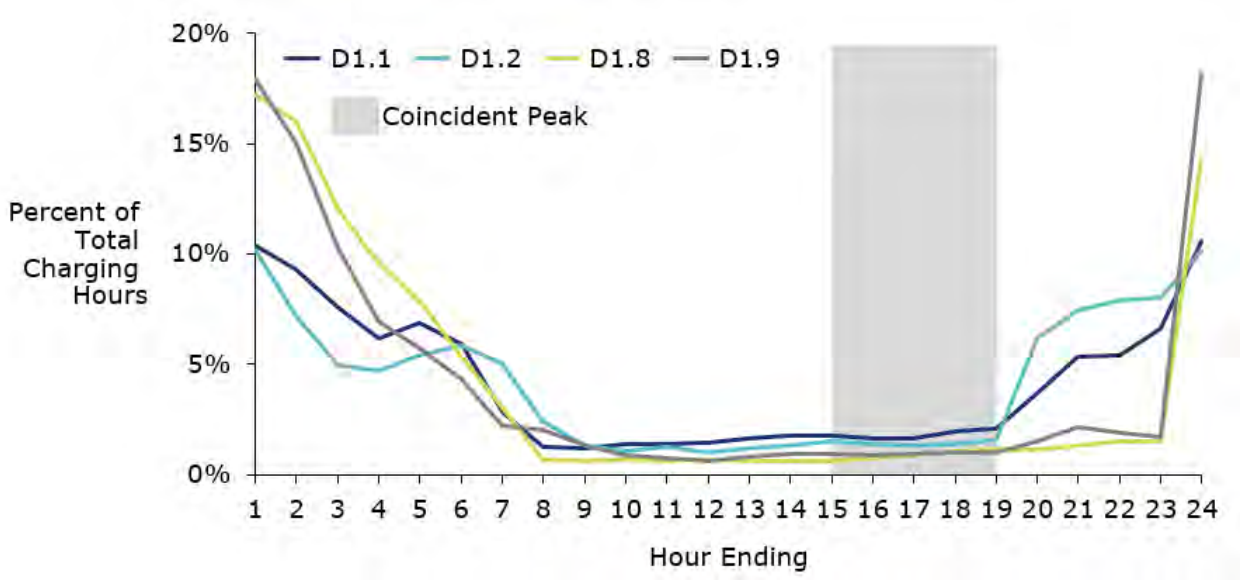
[45] The aggregated load curtailment results of the pilot have not yet been publicized
[46] Eligible EVs include those from Hyundai, Kia, Lexus, Tesla, and Toyota

Figure 5 Example Dashboard for EV Data Sharing Participants



The EV Data Sharing pilot provides DTEE with a more complete understanding of EV driver charging insights because it includes rate D1.11, which is not eligible for the Home Charger Rebate. With a sample of 610 homes enrolled in the pilot, the Company found EV drivers are most likely to be on D1.11 (37%), followed by D1.2 (28%), D1.8, (18%), and D1.9 (16%). Understanding the rates of EV drivers and gathering actual charging behavior data on those rates informs DTEE's messaging, rate design, and distribution planning efforts. The load profiles of these drivers are shown in Figure 6 below.

Figure 6 Load Profiles for EV Data Sharing Participants by Rate, Mar – Oct 2023



5.3 Managed Charging Outlook

The Company's future managed charging plans include bidirectional charging pilots, continued evolution of DTE Smart Charge, and other key learning objectives. Bidirectional charging creates a significant opportunity for EVs to be used as an energy resource. In addition to creating new revenue streams for TE, it can support peak shaving, absorb excess renewable generation, act as backup generation, mitigate local system constraints, and even provide ancillary services such as voltage support. The bidirectional charging industry is in the early stages of development. Although many utilities across the nation are pursuing pilots to test various bidirectional charging technologies, there have not been any industry standards or large-scale deployments due to lack of interoperability among various EVs, chargers, and utilities' telecommunication systems. Despite the challenge, DTEE is committed to working collaboratively with the industry to pilot solutions that can be scaled in the future.

As mentioned above, the DTE Smart Charge program is planned to run through 2024. Key goals for the latest iteration include dynamically charging the vehicle in response to day-ahead pricing signals in early 2024 as well as evaluating the potential to pause or shift EV charging to reduce grid constraints during periods of high demand in the summer months. DTEE has two additional managed charging pilots planned for 2024: a vehicle-to-home (V2H) pilot with two OEMs funded out of the Company's Emerging Technology Fund and a $2 million V2G pilot with school buses. The goal of the V2H pilot is to evaluate the capability of these vehicles to serve as a year-round resource to reduce household demand as well as evaluate customer acceptance of such

programs. For the V2G pilot, the Company aims to encourage V2G deployment with schools, gain additional V2G interconnection experience, test interoperable communications and controls, and address cybersecurity.

DTE will propose future managed charging pilots under the appropriate regulatory framework or through the Emerging Technology Fund as applicable. Desired learnings over the TEP timeframe include the following topics:

- Testing day-ahead hourly price signals,
- Encouraging charging during high renewable generation hours,
- Ramping up EV charging in controlled batches to avoid "timer peaks" created by TOD pricing signals,
- Developing appropriate customer incentives for avoided energy costs, and
- Gaining experience in V2G interconnection requirements.

6 Supporting Functions

6.1 Education & Outreach

DTEE's EV E&O efforts began when Charging Forward first launched in June 2019. The overarching goals are to reduce barriers to EV adoption, efficiently integrate EV load with the Company's electric system by encouraging off-peak charging and help enable equitable access to EVs. Per the ACEEE report referenced above, *"As electric vehicles currently represent a relatively small percentage of the nationwide vehicle fleet, educating the public about program offerings and the benefits of EVs is crucial to ensure uptake and scale transportation electrification into the mainstream."*[47] Further, a white paper from the Alliance for Transportation Electrification and Plug In America observed that, *"A regulated utility is an ideal entity to help educate customers on the benefits of EVs, the correct charging infrastructure needed and EV charging rates, to the benefit of all customers."* The majority of E&O efforts aim to drive customers to DTEE's robust EV webpages. Since program launch, customers have viewed the residential EV website approximately 885,000 times and site hosts and fleet owners have visited the business EV website nearly 130,000 times. The Company also offers the opportunity for in-person EV experiences by providing Ride and Drives, with over 90% of those surveyed stating that they learned "something" or "a lot" about the benefits of EVs at these events. One survey respondent stated, *"I want to thank DTE for providing the opportunity to test drive [an] EV. I wouldn't have*

[47] Utility Transportation Electrification Planning – Emerging Practices to Support EV Deployment | ACEEE

been able to experience driving them without going to a dealership and hoping one was available. The ability to drive different price range EVs was great."

As a related offering, DTEE developed eFleet Advisory Services to empower fleet owners to make informed decisions about how to best electrify their fleets. Additional objectives include supporting customers seeking federal funding and applying lessons learned from initial deployments to future distribution operation planning efforts. Since its launch in October 2021, the Company has reached out to over 40,000 leads, conducted 2,200 consultations, and completed about 405 total cost of ownership analyses for its business customers. From its TEP benchmarking, DTEE found *"…about half the plans detailed fleet advisory services for both light- and heavy-duty fleets…These services help fleet operators understand the business case for electrifying and the investment and special rates the utility could offer."*[48]

As the new fuel provider for EVs and to build off early success, the Company proposed EV E&O as a permanent offering in Case No. U-21297, and the MPSC approved $1.5 million on an ongoing basis for these efforts. Over 90% of surveyed stakeholders felt continued E&O as part of the TEP is either "important" or "extremely important" and nearly 60% responded the same for eFleet Advisory Services with the balance remaining "neutral" in both cases. As its E&O efforts mature with the TEP in 2025, DTEE intends to roll eFleet Advisory Services under the ongoing E&O umbrella. The Company will also explore a similar service for MUDs, including necessary resources and tools, to help address landlord-tenant coordination issues if they remain a barrier despite available incentives.

6.2 Emerging Technology Fund

The Emerging Technology Fund was approved in Case No. U-20836 in November 2022 as a $900,000 grant program to enable timely funding of prudent pilots in a rapidly evolving market. Types of projects considered include EV-grid integration solutions, novel engagement of underserved communities, and second-life applications for used EV batteries. Organizations seeking funding are vetted via three stages of review: initial screening by the EV team, cross-functional review by other business units within DTE, and a final review by the external Advisory Committee. The Advisory Committee was assembled in March 2023 and includes members from the Ecology Center, EPRI, Ford, GM, the MPSC, and Next Energy. The Company achieved alignment to fund six projects that are still in progress and on-track:

[48] Utility Transportation Electrification Planning – Emerging Practices to Support EV Deployment | ACEEE

- Rainforest Automation: Residential load management devices to potentially allow for Level 2 charging without the need for service line or circuit panel upgrades,
- EPRI subscription: Membership to the TE program from EPRI, the research arm for many utilities,
- It's Electric: A public-facing Level 2 charging business model that subsidizes the construction of chargers and tests a revenue sharing model with site hosts,
- Forth: A low-cost, car-sharing pilot with MUD sites in Detroit and Ann Arbor,
- V2H Residential Pilot: A collaborative pilot between DTEE and two OEMs to demonstrate the viability of V2H program offerings (with potential to scale to V2G) as discussed in the Managed Charging Outlook section above, and
- Liberas: An interconnection application enhancement and fault detector solution to demonstrate the viability of dynamically scalable interconnection applications, detection of interconnection faults, and remediation of those faults.

As approved in December 2023 with Case Number U-21297, DTEE will continue the Emerging Technology Fund for five additional years starting in 2024, with a projected annual investment of $1.0 million, pending Advisory Committee review and pilot milestones. This available funding will be especially critical to the Company making progress on its Managed Charging Outlook plans described above and to help added EV load benefits accrue to all DTEE customers.

6.3 Program Administration

Similar to E&O, the Company proposed a permanent EV team with Case No. U-21297 and received approval. The team will be responsible for everything from strategy to program execution, including facilitating EV-related federal funding opportunities for Southeast Michigan, as applicable. A permanent DTEE EV team will provide continuous, stable, and high-quality TEP administration and execution. Annual program administration costs for the TEP time frame are estimated to be about $1.8 million to support labor costs for the EV team and other program costs, such as the web-based rebate application subscription from PowerClerk® and EV industry knowledge sharing.

Additionally, the Company is proposing information technology (IT) investment of approximately $2.5 million, or about 2% of the total proposed rebate investment. This in alignment with – or even below – TEP benchmarking results. The purpose of this IT investment is primarily to:

- Develop data capabilities, especially the ability to track utilization rates and discern trends from across the population of TEP-supported chargers;

- Develop mechanisms to track and report all metrics as discussed in the section Data and Reporting below; and,
- Automate aspects of application and rebate processing, integrate the two processes where helpful, and enable batch processing.

7 TEP Impacts and Reporting

7.1 Promoting Equity

Per the ACEEE report referenced above, *"transportation electrification represents a major opportunity to address long-standing inequities in our energy and transportation systems by providing mobility, investment, and environmental justice solutions to historically marginalized groups and communities."*[49] Out of DTEE's proposed rebate investment of $125 million, half would go to promoting equity in EV and EV infrastructure access, which exceeds the range of dedicated equity investment seen in other utility TEPs, as described in the Benchmarking section above.

DTEE considers the following rebate programs as promoting equity:

- LI SFHs,
- LI MUDs, which primarily house LI residential customers,
- On-route DCFCs in DACs or rural areas, which have fewer chargers than other areas,
- Transit buses, used most frequently by LMI customers, and
- School buses, which transport children.

7.2 Benefit-Cost Analysis

In the November 2022 Order in Case Number U-20836, the Michigan Public Service Commission requested that DTEE *"submit a full scale, well-developed, permanent Charging Forward proposal that includes a BCA."* The Commission additionally stated that *"[t]he requirement of a BCA should not be interpreted as a requirement that all pilots be financially solvent at the time they are proposed (although that is preferable) but that when weighing costs versus benefits for a full-scale program, benefits outweigh costs over the duration of the program."* As such, DTEE developed a robust BCA for the TEP that can be evaluated by segment and for the whole TEP portfolio. This BCA shows that the TEP portfolio provides net benefits to customers over its duration.

DTEE used the net present value (NPV) of the revenue requirement assessed for the TEP programs as the BCA test for the TEP. Revenue requirement is the required additional revenue

[49] Utility Transportation Electrification Planning – Emerging Practices to Support EV Deployment | ACEEE

that DTEE needs to collect from customers to recover the cost of administering the TEP programs. When the TEP programs produce positive revenue requirement NPV, customers will end up paying higher electric rates. Conversely, when the TEP programs produce negative revenue requirement NPV, they provide an offset to electric rates.

The revenue requirement analysis takes the following elements into consideration, segmented by their effects: (+) means they are adding rate pressure whereas (-) means they are providing rate relief.

- (+) utility UMR investment of rebated chargers,
- (+) rebates for chargers,
- (+) Supporting Functions costs (for portfolio-level BCA only),
- (+) energy cost of serving "qualified" additional EV load, and
- (-) electric revenue from "qualified" additional EV load.

It is important to note that the BCA analysis only considers incremental load from rebated chargers (i.e., "qualified" additional EV load). The "qualified" additional EV load occurring on TEP-supported chargers – and accounted for in the BCA – is only about 10% of total expected EV load through 2030.

The rebated charger utilization rates used for the BCA are listed by charger type and customer segment in Appendix D. For added conservatism, DTEE assumes a constant utilization rate, despite the utilization rate likely increasing over time – especially in segments where chargers serve multiple vehicles, such as on-route DCFCs. For most segments, the utilization rate used in the BCA is the average across the four TEP program years as output from the market assessment model. For a few other segments, utilization rates were chosen using Charging Forward data instead. For example,

- LI MUDs and on-route DCFCs in DACs used the lower-end of a range of utilization rates from recent Charging Forward data, and
- Other fleet DCFCs used a utilization rate in line with experience from eFleet Advisory Services.

The energy cost of serving "qualified" additional EV load was calculated for each customer segment as an annual weighted average derived from hourly wholesale power price forecasts,

consistent with DTE's 2022 IRP filing.[50] Electric revenue from "qualified" additional EV load was calculated based on electric tariff rates for EV customers and their average load profiles in their corresponding rate classes. The 2024 values for electric tariff rates and wholesale power price are listed in Table 9 below.

Table 9 2024 Values for Electric Tariff Rates and Wholesale Power Price[51]

Input	$/kWh	Source
SFH charger revenue	0.1502	Weighted average of residential rates D1.11, D1.2, and D1.9[52]
All other charger revenue	0.1340	General service rate D3 (no demand charges)[53]
Wholesale power price	0.0378	2022 IRP

The revenue requirement is calculated using standard utility finance assumptions:

- Rebates are treated as a regulatory asset (amortized over a five-year period)
- Utility UMR investments are capitalized (depreciated over 40-year period, the expected life of the UMR equipment),
- 50/50 debt-to-equity ratio with 9.9% return on equity and 4.1% weighted average cost of debt,
- 26% income tax and 2% property tax
- A discount rate of 6.92% for NPV calculation[54]

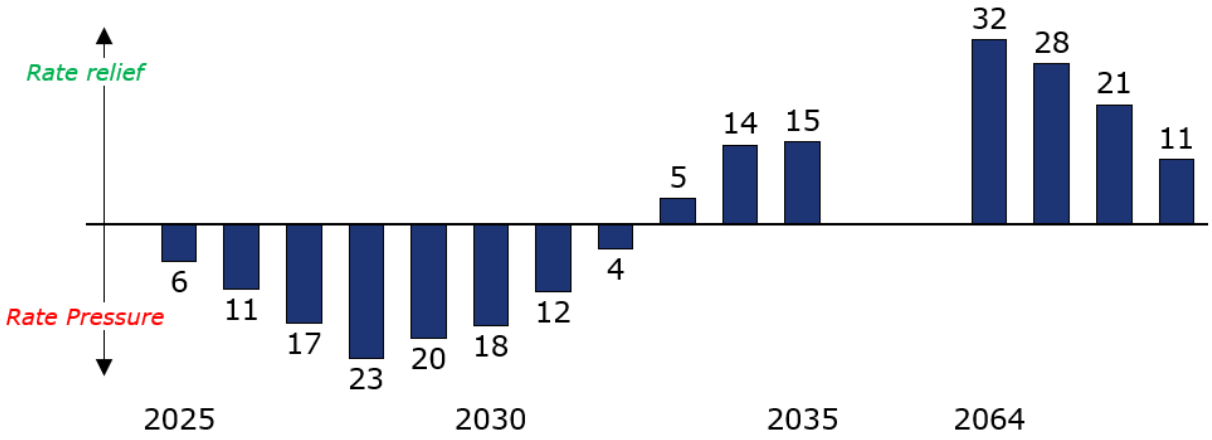
Overall, the TEP portfolio-level BCA results in $56 million of rate relief for DTEE customers. The segment-level revenue requirement NPVs range from $14 million in rate pressure for the DAC/rural on-route DCFC sub-segment to $37 million in rate relief for the other fleet Level 2 segment. The NPV of revenue requirements for all customer segments supported by the TEP are shown in Appendix E. The portfolio-level BCA is the sum of the segment-level NPVs less the NPV

[50] See Appendix F for 2024 values for customer segment cost of energy
[51] Rates assumed to grow at a rate of 2.5% starting in 2025; wholesale power price aligned with 2022 IRP through 2042 and assumed to grow at 2.5% thereafter
[52] Using EV Data Sharing pilot data (participant tariffs and split of on-peak vs. off-peak charging for the corresponding tariffs)
[53] The Company does not anticipate the 1 MW threshold waiver sunset of June 2026 to affect the BCA as the vast majority of DCFC installations will remain below the acceptable threshold. However, DTEE will address this if needed after June 2026
[54] Based on DTEE's currently approved pre-tax weighted average cost of capital of its total capital structure

of increased revenue requirement for Supporting Functions of the TEP as described in the Supporting Functions section above.

As shown in Figure 7 below, the annual revenue requirement initially applies rate pressure, but the TEP begins providing rate relief in 2033, increasing to a maximum of $32 million rate relief in 2064. So, while there is rate pressure in the near-term, it is offset by future rate relief, making rebates beneficial for customers in the long run.

Figure 7 Annual Revenue Requirement from the 2025-2028 TEP Investment ($ millions)



DTEE considers the $56 million in rate relief calculated to result from the TEP investment to be a conservative estimate, for several reasons. First, the BCA only considers incremental load from rebated chargers; it does not take credit for any "network effects" of EV sales influenced by the TEP through reduced range anxiety. In fact, as mentioned above, the "qualified" additional EV load accounted for in the BCA is only about 10% of total expected EV load through 2030. Second, and described previously, utilization rates are held constant over the life of the electrical infrastructure serving the charger (and future upgrades with advanced technology), despite likely increasing over time as EV adoption grows. Third, the BCA does not take credit for any revenue generated in the first year of any rebated charger's installation, despite rebated chargers coming online throughout the year investment occurs. Lastly, the BCA does not consider any societal benefits from reduced tailpipe emissions and reduced greenhouse gas emissions.

7.3 Data and Reporting

Since the launch of its first EV pilot in 2019, DTEE has filed quarterly and annual reports in the Case Number U-20162 docket, and DTEE proposes to continue providing Annual Status Reports for its TEP. The Company proposes to track the following metrics by segment:

- Rebate applications filed,
- Rebate applications approved,
- Charger uptime,
- Charger utilization rate,
- On-peak vs off-peak charging,
- Customer satisfaction,
- Total funding, including funding invested on equity-focused programs (as described in the Promoting Equity section above), and
- Installation cost per port, including utility-owed UMR investment, customer-owed UMR CIAC, CMR, and charger costs.

These metrics will be tracked to guide any needed adjustments of program parameters to maintain and improve customer affordability and effectiveness of the TEP as discussed in more detail in the Key Considerations section below.

7.4 Key Considerations

In alignment with other utilities, DTEE's TEP includes IT investment to establish a foundational capability to monitor, facilitate, and develop the EV charger network in Southeast Michigan in a prudent and effective way. Through data analytics described above, the Company will closely watch market signposts, remain agile, and scale its programs accordingly while ensuring alignment with the overarching TEP guiding principles. Programmatic "guiderails" which DTEE would follow at the portfolio level – regardless of changes to program design – include ensuring:

- Affordability benefits for all DTEE customers at the portfolio level (as calculated using the BCA methodology above), and
- Remaining within total MPSC-approved TEP investment levels (proposing approximately $125 million for rebates and $20 million for other supporting functions over the 2025-2028 timeframe).

Examples of adjustments the Company may need to make within those guiderails to drive TEP success in achieving its goals include rebate dollar amounts, customer eligibility criteria, terms & conditions, and rebate volume by sub-segment. Because the EV market is still relatively new and volatile, DTEE can envision several market developments requiring such modifications, including EV pricing challenges, charger technology advancement, supply chain constraints, federal incentive changes, private market investment changes, and EV sales not occurring as forecasted. Maintaining flexibility to adjust certain program parameters to evolving market dynamics – while

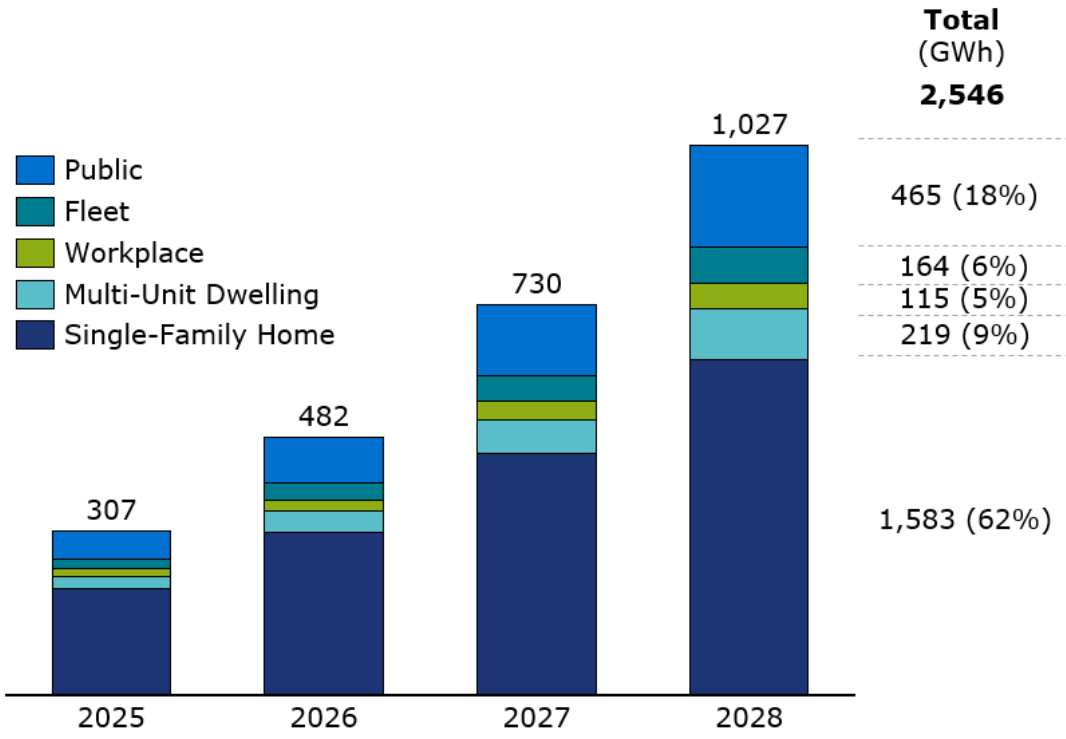
simultaneously adhering to programmatic guiderails – is critical to minimizing risk of stranded investment while effectively facilitating the EV market and MI Healthy Climate Plan.

8 Conclusion

DTEE's TEP is a result of in-depth benchmarking, thorough analysis, and robust stakeholder engagement. It aligns with other utility TEP trends by proposing make-ready rebates, offering enhanced support to the MUD and fleet segments, emphasizing Level 2 charging, and establishing a four-year plan. Stakeholder feedback is generally positive and aligned, especially around the guiding principles. Through this TEP, the Company is facilitating EV adoption, closing charging gaps, and promoting equity while providing NPV affordability benefits of $56 million at the portfolio level for all DTEE customers. It is a balanced $145 million plan that will help the State of Michigan achieve its decarbonization goals. The Company will continue to work with the MPSC and other stakeholders to formally propose and seek approval of the TEP investment in future general rate cases, as applicable.

9 Appendices

Appendix A Annual EV-Specific Consumption by Primary Charger Segment (GWh)



Appendix B Average Approximate Installation Costs by Charger Type and Segment, 2025-2028[55]

Type	Segment	Total UMR	CMR	EV Charger	Total Cost
Level 2	SFH	$230	$1,580	$590	$2,400
	MUD	$1,360	$13,600	$590	$15,550
	Workplace	$330	$13,310	$1,460	$15,100
	Fleet	$1,040	$12,960	$1,440	$15,440
	Other Public	$1,250	$12,520	$1,450	$15,220
DCFC	School bus (60kW)	$16,510	$61,900	$32,750	$111,160
	Transit bus (150kW)	$16,510	$61,890	$79,010	$157,410
	Workplace (150kW)	$5,480	$65,770	$78,210	$149,460
	Fleet (150kW)	$16,500	$61,870	$78,680	$157,050
	On-route (150kW)	$20,630	$61,890	$78,790	$161,310
	Destination (150kW)	$17,710	$53,130	$76,320	$147,160

[55] Rounded to the nearest 10. DTEE data was used to define cost assumptions by charger segment and type. UMR including customer-owed CIAC (typically 15% of utility make-ready on average) and non-CIAC UMR for which DTEE is responsible

Appendix C List of Participating Stakeholder Organizations

EV Industry	Customer Facing	Policy & Advocacy
1. AmpUp	1. Blue Water Area Transit	1. 5 Lakes Energy
2. Atwell	2. City of Ann Arbor	2. Advanced Energy United
3. Blink	3. DDOT	3. Ann Arbor Spark
4. Bollinger Motors	4. Hertz	4. CALSTART
5. BP Pulse	5. Michigan Municipal League	5. Clean Fuels Michigan (CFM)
6. ChargerHelp	6. Michigan Petroleum Association	6. Ecology Center
7. Dunamis	7. Oakland County Commissioner	7. Edison Electric Institute (EEI)
8. Electrify America	8. Oakland Office of Sustainability	8. Electrification Coalition
9. Enel X	9. Small Business Association of Michigan (SBAM)	9. Michigan Energy Innovation Business Council (MEIBC)
10. EV Connect	10. SMART	10. Michigan Public Service Commission (MPSC)
11. Ev.energy	11. Southeast Michigan Council of Governments (SEMCOG)	11. National Resources Defense Council (NRDC)
12. EVgo	12. University of Michigan	12. Office of Future Mobility & Electrification (OFME)
13. Flo	13. University of Michigan Transit	
14. Ford		
15. Ford Next		
16. FreeWire Technologies		
17. General Motors		
18. Highland Electric Fleets		
19. Hoekstra Transportation		
20. International Brotherhood of Electric Workers (IBEW)		
21. Michigan Automobile Dealers Association (MADA)		
22. Navistar		
23. Oscar W Larson		
24. Our Next Energy		
25. Rhombus		
26. Roncelli		
27. Stellantis		
28. Tesla		
29. WeaveGrid		

Appendix D Charger Power and Utilization Rate by Segment and Charger Type

Charger Type	Sub-Segment	Utilization Rates[56]
Level 2 12kW	SFH	2%
	MUD (LI / all other)	6%[57] / 9%
Level 2 19kW	Workplace	1%
	Other fleet	7%
	Destination	8%
DCFC 60kW	School bus	4%
DCFC 150kW	Transit bus	14%
	Workplace	<1%
	Other fleet	5%[58]
	On-route (disadvantaged community & rural / all other)	2%[59] / 4%
	Destination	1%

[56] Except where specifically noted, utilization rates used in the BCA are the average across the four TEP program years as output from the market assessment model
[57] Utilization rate selected for LI MUDs was the lower-end of a range of utilization rates from recent Charging Forward MUD data
[58] Utilization rate selected for Other fleet DCFC using recent Charging Forward eFleets Advisory Services experience
[59] Utilization rate selected for on-route DCFCs in DACs and rural areas was the lower-end of a range of utilization rates from recent Charging Forward on-route DCFC data

Appendix E NPV Revenue Requirement of Proposed TEP Customer Segments

Customer Segment	Customer Sub-segment	TEP Investment (M)	NPV Revenue Requirement (M)[60]
SFHs	LI	$24	-$15
MUDs	LI	$7	+$2
	All other	$21	-$31
Public	DAC/rural on-route DCFC	$22	+$14
	All other on-route DCFC	$15	-$3
Fleet	Other Level 2	$7	-$37
	Other DCFC	$20	-$5
	Transit bus DCFC	$2	-$6
	School bus DCFC	$7	+$7
Supporting Functions		$20	+$17
Total		**$145**	**-$56**

[60] For net revenue requirement, + means the sub-segment or portfolio is adding rate pressure whereas - means it is providing rate relief. See section Benefit-Cost Analysis above for more detail

Appendix F 2024 Cost of Energy Values by Customer Segment[61]

Customer Segment	Cost of Energy ($/kWh)
Single-Family Homes	0.0411
Multi-Unit Dwellings	0.0412
Public	0.0414
Fleet	0.0385
Workplace	0.0408

[61] Cost of energy is an annual weighted average for each customer segment. This is determined by multiplying the hourly load forecast for each customer segment by the corresponding hourly market locational marginal pricing forecast (aligned with 2022 IRP through 2042) to determine the total annual cost for that customer segment, and then that total cost is divided by the total energy consumed by that customer segment. Starting in 2043, cost of energy for all segments is assumed to grow at 2.5%