STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter, on the Commission's own motion, to implement the provisions of Section 6t(1) of 2016 PA 341.	)	Case No. U-21219
In the matter, on the Commission's own motion, to implement the provisions of Section 6t of 2016 PA 341.	)	Case No. U-18461

Introduction

The Michigan Energy Innovation Business Council ("Michigan EIBC") and Advanced Energy Economy ("AEE"; collectively "Michigan EIBC/AEE") appreciate the opportunity to provide comments in Docket Nos. U-21219 and U-18461 regarding Revised Integrated Resource Plan Filing Requirements and Integrated Resource Planning Parameters.

Michigan EIBC/AEE appreciate the Commission's leadership in establishing transparent, effective filing requirements and planning parameters to guide utility integrated resource planning ("IRP"). Michigan EIBC/AEE particularly applaud the Commission's express incorporation of the utilities' articulated climate action goals, along with the greenhouse gas ("GHG") reduction goals set by Governor Whitmer in ED 2020-10 and many of the recommendations included in the MI Healthy Climate Plan. We remain concerned, however, about the treatment of many advanced energy technologies, including demand response, energy storage, energy waste reduction ("EWR"), and vehicle-to-grid ("V2G") applications. Particularly in light of the time horizon of IRP modeling, if the Commission fails to provide IRP guidance that fully considers and optimizes use of advanced energy resources in utility planning, state and utility GHG reduction goals may remain out of reach, and resource acquisition decisions may be made that are inconsistent with the overarching goals of conducting integrated resource planning.

We provide below a summary of recommendations and detailed comments regarding Staff's Revised Integrated Resource Plan Filing Requirements ("Filing Requirements") and Integrated Resource Planning Parameters ("Planning Parameters") filed in the above-listed dockets.

Summary of Recommendations

Filing Requirements

- Support the requirement that utilities issue a Request for Proposals ("RFP") for new supply-side resources.
- Support the recommendation that the utilities hold hybrid (virtual and in-person) public meetings to both educate the public on the utility's planning process, as well as to provide a meaningful opportunity for the public to comment.
- Support the requirement that utilities identify, quantify, and provide evidence that shows progress in meeting any state, federal, or utility announced GHG reduction goals.
- Recommend that any IRP presentations/related materials be made publicly available on a website for the duration of the IRP proceeding and at least through the subsequent IRP proceeding so that comparisons can be made between the pending and immediately prior proceeding.
- Support the emphasis on renewable energy and many of the required descriptions related to inclusion of renewable energy.
- Recommend adding the role of electric vehicles ("EVs") in providing supply-side power and storage capacity through V2G applications to the requirements of Section VI: Existing Supply-Side Resources, along with an express requirement to model V2G as a supply-side resource in future projections.

Planning Parameters

- Recommend including the energy storage target set by the MI Healthy Climate Plan by adding a bullet point to Scenario #2 which reads: "Statewide, achieve 1,000 MW of energy storage by 2025, with an additional 1,500 MW added by 2030, with the ultimate goal of 4,000 MW by 2040."
- Recommend deleting the phrase "to the extent that such guidelines exist" regarding energy storage modeling from Section VII under both Scenario #1 and Scenario #2.
- Recommend that the Commission clarify the best practices for modeling energy storage that the utilities are expected to adhere to in IRP, including, for example, sub-hourly modeling, most recent cost estimates, a net-cost-of-capacity approach, and modeling of participation in all markets in which storage is capable of providing services.
- To account for atypical weather conditions, recommend adding an additional sensitivity to Scenario #2 as follows: "Model the impact of atypical weather conditions that occur at least as frequently as once in ten years, either via a load forecast adjustment or a stochastic analysis of weather risks. Needs should be met within the bounds of required emissions reduction targets."
- Support the inclusion of a 2% EWR target in both Scenarios #1 and #2.
- Recommend requiring the utilities to augment the Guidehouse Potential Studies with prior EWR and demand response "DR" potential studies and additional research.
- Support inclusion of distributed energy resources ("DERs") as both supply-side and demand-side resources.
- Recommend that EVs should not only be considered as new load, but also, should be modeled as potential sources of generation and storage.

- Recommend the addition of the following resources to "Section VIII. Michigan IRP Modeling Input Assumptions and Sources" under either Section "15 - Other Resources" or "17 - EV Forecasts:"
    - The Interstate Renewable Energy Council's "V2X Roadmap"
    - The Citizens Utility Board's "The ABCs of EVs: A Guide for Policy Makers and Consumer Advocates"
    - The ZEV Alliance's "Implementing Open Smart Charging"
    - The Institute for Energy Innovation's "Energy Storage Roadmap for Michigan"

Comments re: Filing Requirements

RFP Requirement
Michigan EIBC/AEE support the clear requirement in the Filing Requirements that utilities issue an RFP for new supply-side resources. As stated by the Commission in Case No. U-20852, issuance of an RFP can help "reveal available resource options, ensure emerging technologies can be considered as part of utility planning and procurement, and potentially result in lower costs and higher value for customers."[1] We wholeheartedly agree. This requirement also aligns with the Commission's objective in the recently issued Competitive Procurement Guidelines "to ensure strong, technology-neutral market response and value for ratepayers through transparency, non-discriminatory access, certainty, and fairness in bidding processes."[2]

Stakeholder Engagement
Michigan EIBC/AEE support the Staff's approach to stakeholder engagement, including the recommendation that the utilities hold hybrid (virtual and in-person) public meetings to both educate the public on the utility's planning process, as well as to provide a meaningful opportunity for the public to comment. Providing a virtual participation option continues to be an important tool in reducing barriers to stakeholder engagement, and we note that the Commission has used this option successfully both prior to and during the Covid-19 pandemic. Similarly, we support the provision of all presentations and related materials on a website open to the public. Michigan EIBC/AEE recommend that such materials be made publicly available on a website for the duration of the IRP proceeding and at least through the subsequent IRP proceeding so that comparisons can be made between the pending and immediately prior proceeding.

Climate Change
Michigan EIBC/AEE strongly support the inclusion of the State's and utilities' climate action goals in the process of updating utility IRP Filing Requirements and Planning Parameters. The road to carbon neutrality will involve changes to Michigan's energy system, many of which are already well underway. As Michigan's electricity generation profile shifts, low-cost, renewable resources will be in greater demand across the state. As such, it is increasingly important that utility planning takes into account both the reality of climate change impacts and risks, and the policies being enacted to mitigate and adapt to these impacts.

[1] Order dated September 9, 2021. Case No. U-20852.
[2] *Id*. p. 3.

In the Filing Requirements, Michigan EIBC/AEE support the requirement that utilities identify, quantify, and provide evidence that shows progress in meeting any state, federal, or utility announced GHG reduction goals. We also support the incorporation of the full range of potential impacts of climate change in the forecasts included in the risk assessment.

Renewable Energy

Michigan EIBC/AEE are cognizant of the importance of renewable energy deployment in meeting the State's and utilities' articulated climate action goals. As stated in the MI Healthy Climate Plan, "Michigan will need a massive scaling up of renewable energy to achieve 60 percent renewable energy penetration this decade and reach carbon neutrality by 2050" and "higher levels of renewable energy penetration will be necessary to achieve our goals and customer-enabled renewable energy will play a central role in additional gains."[3]

In light of this reality, Michigan EIBC/AEE applaud the emphasis on renewable energy in the IRP Filing Requirements, and strongly support many of the required descriptions related to inclusion of renewable energy, including:

> 1) How the electric provider's plan is consistent with the renewable energy goals required by the Michigan Legislature (e.g. 35% combined renewable energy and energy waste reduction (EWR) goal by 2025);
>
> 2) The options for customer-initiated renewable energy that will be offered by the electric provider and forecast sales of customer-initiated renewable energy; and
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> 3) How the electric provider will meet the demand for customer- initiated renewable energy.

We do note however, that the term "customer-initiated renewable energy" might be unclear and could use additional clarification. We believe that this term refers to behind-the-meter customer or third-party owned projects, community solar projects, as well as other renewable energy capacity developed to meet demand from utility Voluntary Green Pricing ("VGP") programs. These types of projects are being developed, in part, based on economic and other considerations that fall outside of the IRP modeling framework, but can be significant in scale. For example, the recent announcement between Ford and DTE to develop 650 MW of solar through DTE's MIGreenPower program[4] illustrates the potential of this type of capacity. In addition, the Commission's ongoing work in multiple proceedings and investigations to further develop the DER market in Michigan could also lead to significant increases in distributed solar development during the 20-year IRP planning horizon that is not fully factored into IRP modeling. Given the

[3] Michigan Department of Environment, Great Lakes, and Energy. "MI Healthy Climate Plan." April 2022. Available at https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Offices/OCE/MI-Healthy-Climate-Plan.pdf?rev=d13f4adc2b1d45909bd708cafccbfffa&hash=99437BF2709B9B3471D16FC1EC692588. p. 35.

[4] Ford Media Center. "Ford Motor Company and DTE Energy Announce the Largest Renewable Energy Purchase From a Utility in U.S. History." August 10, 2022. Available at https://media.ford.com/content/fordmedia/fna/us/en/news/2022/08/10/ford-motor-company-and-dte-energy.html.

magnitude of these markets, IRP modeling needs to take them into account so that the portfolios approved in IRP proceedings do not include development or acquisition of other capacity that is not needed, retain existing fossil-fuel capacity when it is no longer needed, or lack the performance characteristics needed to effectively integrate this additional renewable energy capacity (such as including sufficient energy storage or demand flexibility).

Customer-initiated renewable energy can also provide valuable grid services, and we believe that the Commission's efforts around DERs are intended to help unlock and fairly compensate DERs for this value. IRP modeling should take this into account, for example by using modeling tools like the Vibrant Clean Energy WIS:dom tool.

Electric Vehicles

Michigan EIBC/AEE support the inclusion of details related to EV adoption assumptions and impacts to overall peak demand energy forecasts. However, we remain concerned about the classification of electric vehicles solely as a demand-side resource. Given the technological innovation and expansion of managed charging ("V1G") and vehicle-to-grid ("V2G") applications, which enable electricity to be exported onto the grid from EV batteries, EVs should also be considered a supply-side resource. Specifically, while the IRP Filing Requirements call for the utilities to "Detail electric vehicle adoption assumptions and impacts to overall peak demand and energy forecasts" (Section X(b)(ix)), the role of electric vehicles in providing supply-side power and storage capacity through V2G applications should be added to the requirements of Section VI: Existing Supply-Side Resources, along with an express requirement to model V2G as a supply-side resource in future projections. Particularly in light of the time horizon of IRP modeling, omitting this from the analysis will leave out a significant and valuable resource, especially considering the aggressive goals that Michigan has for EV deployment.

Comments re: Planning Parameters

MI Healthy Climate Plan – Energy Storage Target

Michigan EIBC/AEE support the Staff's recognition of the MI Healthy Climate Plan as well as other state and federal policies in the two required modeling scenarios. As discussed in relation to the Filing Requirements, Michigan EIBC/AEE strongly support the inclusion of the States' and utilities' climate action goals in the updated Filing Requirements and Planning Parameters.

However, Michigan EIBC/AEE remain concerned that the Planning Parameters do not expressly recognize the State of Michigan's energy storage target, as detailed in the MI Healthy Climate Plan, which adopts a statewide storage target to deploy 4,000 MW of storage by 2040 with a short term target of 1,000 MW by 2025, and a medium term target of 2,500 MW by 2030.[5] The

[5] Michigan Department of Environment, Great Lakes, and Energy. "MI Healthy Climate Plan." April 2022. Available at https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Offices/OCE/MI-Healthy-Climate-Plan.pdf?rev=d13f4adc2b1d45909bd708cafccbfffa&hash=99437BF2709B9B3471D16FC1EC692588. p. 33.

MI Healthy Climate Plan also calls for utilities to "[i]ncrease consideration of energy storage resources in utility Integrated Resource Plans through accurate modeling."[6]

These targets should be included in the baseline of Scenario #2. As written, Scenario #2 currently "incorporates 100% of utility IRPs and announced state and utility goals within their respective timelines and assumes that 100% of the utility and state goals are met." The energy storage target in the MI Healthy Climate Plan is an "announced state goal" and, as such, falls under this scenario. Therefore, a bullet point should be added in Scenario #2 which reads: "Statewide, achieve 1,000 MW of energy storage by 2025, with an additional 1,500 MW added by 2030, with the ultimate goal of 4,000 MW by 2040."

Energy Storage Modeling Practices

Michigan EIBC/AEE strongly support the inclusion of energy storage technologies in the modeling scenarios. Energy storage resources are fundamental to the operation of a reliable and cost-effective grid, especially as the state moves toward higher adoption of renewable energy resources. Long-duration energy storage resources, capable of discharging at full rated capacity for longer than eight hours, can provide firming services during extended periods, while short-duration energy storage resources can provide vital dispatchable capacity to meet Michigan's resource adequacy needs, meet critical needs during peak hours, and provide dynamic balancing and other ancillary services. Storage, like other advanced energy technologies, will continue to see declining costs over time, with further reduction in costs due to the newly established Investment Tax Credit for stand-alone storage in the Inflation Reduction Act. Each of NREL's cost projection scenarios estimate substantial decreases in cost through 2050.[7]

Despite these expected cost declines and the fact that storage may be the least cost, highest value resource, IRP modeling may fail to capture the full benefits that storage provides. We remain concerned that, as written, the Planning Parameters and Filing Requirements do not adequately ensure that storage resources will be accurately and fully considered. In some cases, this may be due to the inclusion of unreasonable model constraints established by a utility that act to "force" existing thermal resources to be selected by the model instead of new renewable and energy storage resources. In addition, we remain concerned that in both scenarios, there is a requirement that: "Energy storage resources are modeled using available best practice methodologies to the extent that such guidelines exist." This requirement is concerning because, while best practices for modeling storage are well established, best practices are not generally compiled as formal "guidelines" for modeling energy storage or any other set of supply-side resources. More generally, it is unclear what would constitute such "guidelines" and whether the existence of such "guidelines" would be entirely up to utility discretion. We are concerned that this language could be misleading and may result in utilities not fully considering storage in their modeling.

There are a variety of ways storage can be considered as part of IRP planning processes. In 2018, the National Association of Regulatory Utility Commissioners passed a resolution on modeling energy storage. The resolution recommended a number of principles to guide NARUC member states in modeling energy storage and other flexible resources, including using tools to model the

[6] *Ibid.*

[7] Cole, W., Frazier, W., Augustine, C. National Renewable Energy Laboratory. June 2021. "Cost Projections for Utility Scale Battery Storage: 2021 Update." Available at https://www.nrel.gov/docs/fy21osti/79236.pdf.

"full spectrum of services that energy storage and flexible resources are capable of providing, including subhourly services."[8] Some states, including California, Oregon, and Virginia require regulated utilities to procure energy storage.[9, 10] Other states encourage or require utilities to consider storage assets in the IRP process. For example, under Washington law, an IRP "must assess other distributed energy resources that may be installed by the utility or the utility's customers including, but not limited to, energy storage, electric vehicles, and photovoltaics. Any such assessment must include the effect of distributed energy resources on the utility's load and operations."[11] In 2017, the Washington Utility and Transportation Commission issued an Energy Storage Policy Statement on Treatment of Energy Storage Technologies in Integrated Resource Planning and Resource Acquisition that provided guidance for "how utilities should model energy storage within the traditional construct of hourly IRP models."[12] In Oregon, Portland General Electric's 2016 IRP determined under what use cases the value of storage to the utility's system would exceed the cost of a battery system in 2021.[13] In Arizona, Arizona Public Service Company's IRP reflects a demand-side management plan that includes behind the meter batteries on targeted distribution feeders.[14]

When considering storage in an IRP context, a utility must be fully able to assess the value of storage to the grid, the utility, and ratepayers, including by utilizing sub-hourly and 8760 modeling. If accurate modeling of energy storage resources is not possible given model limitations, storage benefits can be incorporated into IRPs using a net-cost-of-capacity approach.[15, 16] Under this method, operational benefits of storage that are difficult to represent accurately within the IRP model (e.g., the value of real-time energy arbitrage or ancillary services) can be estimated using a separate analysis outside the IRP model and credited to storage within the IRP model as a reduction in the installed cost of storage. In expert witness testimony provided in response to Consumers Energy's most recent IRP (Case No. U-21090),

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[8] National Association of Regulatory Utility Commissioners. November 2018. "EL-4/ERE-1 Resolution on Modeling Energy Storage and Other Flexible Resources." Available at https://pubs.naruc.org/pub/2BC7B6ED-C11C-31C9-21FC-EAF8B38A6EBF.

[9] Stanfield, S., Petra, J. S., and Auck, S. B. Interstate Renewable Energy Council. April 2017. "Charging Ahead: An Energy Storage Guide for State Policymakers." Available at https://irecusa.org/resources/charging-ahead-energy-storage-guide-for-policymakers/.

[10] Burwen, J. Energy Storage Association. 2020. "Energy Storage Goals, Targets, Mandates: What's the Difference?" Available at https://energystorage.org/energy-storage-goals-targets-and-mandates-whats-the-difference/.

[11] Washington Administrative Code 480-100-620. Available at https://app.leg.wa.gov/WAC/default.aspx?cite=480-100-620.

[12] Washington State Utilities and Transportation Commission. October 2017. "Report and Policy Statement on Treatment of Energy Storage Technologies in Integrated Resource Planning and Resource Acquisition." Dockets UE-151069 and U-161024 (Consolidated). Available at https://apiproxy.utc.wa.gov/cases/GetDocument?docID=237&year=2016&docketNumber=161024.

[13] *Ibid*.

[14] Arizona Public Service Company. 2020 Integrated Resource Plan. Available at https://www.aps.com/-/media/APS/APSCOM-PDFs/About/Our-Company/Doing-business-with-us/Resource-Planning-and-Management/2020IntegratedResourcePlan062620.ashx?la=en&hash=24B8E082028B6DD7338D1E8DA41A1563. pp. 22, 66-67.

[15] Energy Storage Association. 2018. "Advanced Energy Storage in Integrated Resource Planning." Available at https://energystorage.org/wp/wp-content/uploads/2019/09/esa_irp_primer_2018_final.pdf.

[16] Cooke, A. L., Twitchell, J. B., O'Neil, R. S. Pacific Northwest National Laboratory. May 2019. "Energy Storage in Integrated Resource Plans." Available at https://energystorage.pnnl.gov/pdf/PNNL-28627.pdf.

Michigan EIBC witness Ed Burgess described several flaws with Consumers' modeling of energy storage, including the lack of sub-hourly dispatch and overly restrictive assumptions on market participation. Mr. Burgess notes that "Stategen has conducted analyses showing that this real-time dispatch has the potential to increase the value of a storage system in some cases by up to approximately 80%."[17]

Other best practices for storage modeling in IRP processes have been identified by researchers at the Lawrence Berkeley National Laboratory ("LBNL") and Pacific Northwest National Laboratory ("PNNL"). A recent paper, "State of the Art Practices for Modeling Storage in Integrated Resource Planning," recognizes that the flexibility and scalability benefits of energy storage are continuously undervalued in the models that utilities currently use.[18] The authors argue that "more accurate inputs (e.g., up to date costs and forecasts) and improved modeling methods (e.g., assessing benefits for a wider range of grid services, incorporating behind-the-meter (BTM) applications) are needed to better integrate storage into planning processes."[19] LBNL and PNNL have devoted a significant amount of attention to developing best practices for modeling energy storage in IRPs. Michigan EIBC/AEE recommend that the Commission utilize this work to clarify the best practices that utilities are expected to adhere to. We are concerned that without direct guidance from the Commission, the current draft language may be used to argue that guidelines do not exist.

As such, we recommend: 1) deleting the phrase "to the extent that such guidelines exist" from Section VII under both Scenario #1 and Scenario #2; and 2) that the Commission clarify the best practices for modeling energy storage that the utilities are expected to adhere to in IRP, including, for example, sub-hourly modeling, most recent cost estimates, a net-cost-of-capacity approach, and participation in all markets in which storage is capable of providing services.

Extreme Weather

The Planning Parameters should ensure that IRP scenarios account for atypical weather conditions that occur at least as frequently as once in ten years, or include a stochastic analysis of atypical weather risks. Without this capability, capacity expansion models are unlikely to select portfolios that remain least-cost during the range of weather events that are likely to occur. Critically, such a sensitivity should not be used to justify a deferral or avoidance of the emissions targets set by the state. Non-emitting resources, like energy storage, are available to address reliability risks if appropriately modeled.

To address these concerns, an additional sensitivity could be added to Scenario #2 as follows: "Model the impact of atypical weather conditions that occur at least as frequently as once in ten years, either via a load forecast adjustment or a stochastic analysis of weather risks. Needs should be met within the bounds of required emissions reduction targets."

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[17] Direct Testimony of Ed Burgess on Behalf of the Michigan Energy Innovation Business Council, Institute for Energy Innovation, and Clean Grid Alliance. Case No. U-21090. Available at https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t000000ViZ2QAAV. p. 234.

[18] Miller, C., Twitchell, J. and Schwartz, L. October 12, 2021. "State of the Art Practices for Modeling Storage in Integrated Resource Planning." Innovations in Electricity Modeling: Training for National Council on Electricity Policy. Available at https://pubs.naruc.org/pub/CCBEFC58-1866-DAAC-99FB-3A405315FB9B.

[19] *Ibid*.

EWR/DR Potential Studies

Michigan EIBC/AEE applaud the inclusion of a 2% energy waste reduction ("EWR") target in both Scenarios #1 and #2. This is in line with the MI Healthy Climate Plan, which calls for utilities to "[a]chieve at least 2% annual electric energy efficiency savings by increasing the current energy waste reduction target for electric utilities and maintaining the corresponding incentives for exceeding statutory minimums" and to "[w]ork to ensure energy efficiency is on a level playing field with supply-side resources (i.e., power generation) in the MPSC integrated resource planning (IRP) process which guides the financial investments of Michigan utilities."[20]

However, Michigan EIBC/AEE are concerned about the sole reliance in the Filing Requirements and Planning Parameters on the Guidehouse EWR and Demand Response Potential Studies,[21] as these studies are unlikely to reflect accurate potential for savings from EWR and DR due to their methodology and timing. Both studies were completed from August 2020 to September 2021, spanning an intense phase of the Covid-19 pandemic when customers were experiencing enormous disruption. Because these studies relied heavily on customer participation in surveys and sensitivity to "willingness to pay" during a time of personal and economic upheaval, they are unlikely to reflect the complete picture for EWR and DR potential in Michigan from 2021 to 2040. In the final Filing Requirements and Planning Parameters, the utilities should be required to augment the Guidehouse Potential Studies with prior EWR and DR potential studies and additional research. In any event, given the significant concerns with the Guidehouse Potential Studies referenced in the IRP Planning Parameters, it will be critically important for the utilities to aim high, exceeding the 2% EWR target wherever possible.

DERs and Electric Vehicles

Michigan EIBC/AEE appreciate language in the Filing Requirements and Planning Parameters that indicates that DERs should be considered both as demand-side and supply-side resources. For example, in Scenario #1 and Scenario #2 of the Planning Parameters, Staff note that "a utility may develop its own demand and energy forecasts with description and detail how its forecast has included the impacts of climate change, electrification, demand side resources, and customer owned distributed generation and how these factors change overall load and demand."

It is important, as customer-sited DERs like rooftop solar, energy storage, and combined-heat and power units become more prevalent across the state, that the utilities model these resources both as demand-side and supply-side resources. We note, for example, in the recent settlement agreement in the Consumers IRP case (Case No. U-21090), that Consumers Energy agreed in the next IRP "to develop a distributed generation as a resource model approach that considers

[20] Michigan Department of Environment, Great Lakes, and Energy. "MI Healthy Climate Plan." April 2022. Available at https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Offices/OCE/MI-Healthy-Climate-Plan.pdf?rev=d13f4adc2b1d45909bd708cafccbfffa&hash=99437BF2709B9B3471D16FC1EC692588. p. 41.

[21] Guidehouse Inc. "Michigan Energy Waste Reduction Statewide Potential Study (2021-2040)." August 2021. Available at https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/workgroups/ewr-study/mi_ewr_statewide_potential_study_final_draft_report.pdf?rev=7c5ca1a1757943fbbd163c3b71d8f6c7&hash=DD4A326084041574802DE5F9170214.DA; Guidehouse Inc., Michigan Demand Response Statewide Potential Study (2021-2040). Available at https://www.michigan.gov/mpsc/-/media/Project/Websites/mpsc/workgroups/potential_studies_2021/MI_DR_Statewide_Potential_Study_Report_-_Final.pdf.

economic distribution connected solar to be modeled by bundling resources installed at the customer level to compare the total economic costs to the utility of distributed generation as a resource to other selectable supply-side resources, consistent with the methodology used for EWR."[22]

Despite these important inclusions, we remain concerned that the capacity of EVs to serve as a grid asset through V2G interoperability is not captured in the Planning Parameters. In the Planning Parameters, EVs are viewed primarily as a source of additional demand on the grid. However, given the time horizon of the IRP planning process, it is both appropriate and prudent for utilities to fully consider the potential for EVs to serve as resources for the grid. Below we suggest how this could be reflected in the Planning Parameters and also provide several resources that could be included in the Appendix of the Planning Parameters.

Even among the most conservative projections of EV adoption, the cumulative storage capacity contained in the batteries of Michigan drivers' personal EVs, as well as within fleets of medium and heavy duty EVs, will quickly become relevant as a storage asset. As it stands now, Bloomberg New Energy Finance estimates that there is 482 GWh of battery capacity in EVs currently on the road, globally, which is more than ten times the amount of installed stationary storage. Tapping into a fraction of the storage capacity of EVs through V2G technology could have enormous benefits for an electric grid with high renewable penetration. This emerging use case for EVs should therefore be considered in both Scenarios #1 and #2 of the Planning Parameters, but especially the latter, which assumes "EV adoption reaches 50% of total vehicle sales by 2030 with a continuing trend toward 100% of vehicle sales."

Throughout the Planning Parameters, EVs should not only be considered as new load, but also should be modeled by the utilities as potential sources of generation and storage. If the utilities are serious about detailing demand and energy forecasts and understanding "electrification, demand side resources, and customer owned distributed generation," then the potential of vehicles as both a demand side and supply side resource should be considered.

To facilitate discussion and understanding of V2G technologies as a grid resource, we recommend the addition of the following resources to "Section VIII. Michigan IRP Modeling Input Assumptions and Sources" under either Section "15 - Other Resources" or "17 - EV Forecasts:"

- The Interstate Renewable Energy Council's "V2X Roadmap"
- The Citizens Utility Board's "The ABCs of EVs: A Guide for Policy Makers and Consumer Advocates"
- The ZEV Alliance's "Implementing Open Smart Charging"
- The Institute for Energy Innovation's "Energy Storage Roadmap for Michigan"

Conclusion

We appreciate the significant work of Staff and the Commission throughout this update cycle of the state's IRP Planning Parameters and Filing Requirements. Given pace at which the electricity system is changing and will continue to change, particularly in light of ongoing technological

[22] Order dated June 23, 2022. Case No. U-21090.

innovation and Michigan's forward-looking policies on clean energy, this update cycle may prove to be the most consequential for some time. Modeling and forecasting during periods of rapid technological and market change is not easy, but we believe our recommendations will help ensure that the entire suite of advanced energy technologies is fully and fairly included in IRP modeling. This will be critical to helping the state meet its energy and environmental policy goals in a cost-effective, equitable manner. We look forward to continuing to work with Staff, the Commission, and other stakeholders on this important topic.