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May 11, 2018

Ms. Kavita Kale,
Executive Secretary
Michigan Public Service Commission
7109 West Saginaw Highway
Lansing, Michigan 4891

Re: Case No. U-20147- In the matter, on the Commission's own motion to open a docket for certain regulated electric utilities to file their five-year distribution investment and maintenance plans and for other related uncontested matters.

Dear Commissioners and Staff,

The Michigan Energy Innovation Business Council (Michigan EIBC) and the Advanced Energy Economy Institute (AEE Institute) respectfully submit these comments on regulated electric utilities' five-year distribution investment and maintenance plans in Case No. U-20147. On April 12, 2018, the Commission opened the docket and invited public comments regarding Consumers Energy Company's and DTE Electric Company's final five-year investment and maintenance distribution plans. Our comments focus on opportunities related to the two plans and provide perspectives on regulatory practices to develop effective distribution system planning processes.

If there are any questions, comments, or concerns related to these comments, feel free to contact us directly.

Regards,

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STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

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| In the matter, on the Commission's own motion to open a docket for certain regulated electric utilities to file their five-year distribution investment and maintenance plans and for other related uncontested matters | Case No. U-20147 |

## Introduction

The Michigan Energy Innovation Business Council (Michigan EIBC) and the Advanced Energy Economy Institute (AEE Institute) appreciate the opportunity to provide these comments in response to the Michigan Public Service Commission (hereafter MPSC or Commission) Order issued April 12, 2018. In these comments, we (1) provide commentary about the potential for the MPSC to improve future distribution system planning (DSP) processes; and (2) provide specific commentary on the filed plans from Consumers Energy Company (Consumers) and DTE Electric Company (DTE Electric).

Michigan EIBC is a trade organization of more than 100 advanced energy companies doing business in Michigan. Michigan EIBC works to grow the state's advanced energy economy by fostering opportunities for innovation and business growth and offering a unified voice in creating a business-friendly environment for the industry in Michigan.

AEE Institute is a 501(c)3 nonprofit educational organization promoting greater public understanding of advanced energy and its economic potential. AEE Institute provides critical data to drive the policy discussion through commissioned research and reports, data aggregation and analytic tools. AEE Institute also provides a forum where leaders can address challenges and opportunities facing the United States. AEE Institute is affiliated with Advanced Energy Economy (AEE), a 501(c)(6) national business association, representing leaders in the advanced energy industry. AEE supports a broad portfolio of technologies, products and services that enhance U.S. competitiveness and economic growth through an efficient, high-performing energy system that is clean, secure, and affordable.

Michigan's utilities are responsible for maintaining a safe, reliable and affordable electricity system. Regulators and utilities have developed planning techniques and practices to fulfill those and other policy-driven obligations. We agree with the Commission's statement in its October 11 order, p. 14: "[…] there are significant benefits associated with a comprehensive and forward-looking approach to distribution planning that leverages greater Commission and stakeholder input." Future distribution system planning ("DSP") will need to continue to evolve to facilitate, accommodate, and benefit from stakeholder engagement.

Changing technologies on both the grid and customer premises, including the adoption of distributed energy resources (DER),[1] are making planning processes more complex, but those processes could also be capable of delivering increased value for customers and grid operators if they can lead to effective integration of DERs. The evolving needs and expectations of customers and changing energy technology options require increased information sharing and engagement, including with respect to DSP. These trends are naturally leading to higher penetrations of DER on the electricity grid, and DSP best practices should reflect these changing circumstances.

Both Michigan EIBC and AEE Institute value recent opportunities to engage with the Commission on these topics. We believe it is important to explore DSP for the state, examining a range of best practices for integrating new technologies into the electric power system. We believe that these discussions and Commission action are creating benefits for customers and the power grid, and will ultimately position the state's utilities for greater success in their evolving role as the owners and operators of an increasingly complex electricity system. We commend the Commission and Commission staff for their vision and leadership and appreciate the opportunity to engage in this proceeding.

[1] We define DER broadly to include distributed generation of all types, energy efficiency, demand response, energy storage, microgrids, and electric vehicles. As such, DER includes options for generating electricity as well as for managing how much and when electricity is used.

## I. Review of MPSC DSP process

The MPSC is viewed nationally by regulatory authorities and industry as a leader on discussions related to DSP. By engaging in a variety of forums in recent years, the Commission identified strategic objectives and considered the capabilities of advanced energy technologies in meeting those objectives. The Commission continues to examine ways to lower system costs in an era when a significant portion of the state's distribution system components are exceeding their useful life.

We agree with the Commission that "Given the level of investments being made in the electric distribution system, it is important for the MPSC and stakeholders to understand the longer-term investment strategies, as well as their costs, benefits, and other effects for customers."[2] By considering options, the Commission is creating greater engagement around the over $900 million combined annual investments in distribution infrastructure.

The Commission has taken several proactive steps to address grid issues by requiring major electric utilities to file 5-year distribution plans (hereafter "5-Year Plans"). In orders issued on January 31, 2017 and February 28, 2017, the Commission expressed a desire to properly evaluate utility investments in aging distribution systems. On August 3, 2017, AEE Institute hosted a forum at the MPSC to discuss the policy, market, and technology trends of a 21st century electric grid. On August 4, 2017, the MPSC sought public input on electric grid reliability draft plans, in the form of Commission ordered 5-Year Plans for Consumers (Case No. U-17990) and DTE Electric (Case No. U-18014). The Commission intended these plans to increase visibility into the needs of the electricity delivery systems. The Commission invited public input in multiple areas, including:

- Whether the draft plans provided a transparent review to identify and make cost-effective grid modernization and aging infrastructure investments necessary to support improved reliability, power quality, and future growth.
- If proposed investments provided a clear path to address resiliency, reliability, and grid modernization, consistent with the MPSC's goals outlined in the rate case orders.
- If the plans identified system upgrades or investment strategies and concrete, measurable performance targets and timeliness in areas such as safety and reliability.
- Whether there are longer-term enhancements to the plans or the planning process that the MPSC, utilities and stakeholders should be considering in future discussions.

[2] MPSC Issue Brief: Electric Distribution System Planning. Issued October 11, 2017.

On October 11, 2017, the Commission issued a supplemental order, clarifying the scope of the first iteration of the 5-Year Plans. The draft plans were to provide detailed accounts of priorities, needs, and potential spending on distribution system infrastructure. Accompanying the order was an MPSC Issue Brief outlining that utilities should include descriptions of distribution system conditions, system goals and reliability metrics, expected customer needs, maintenance and upgrade plans, and cost/benefit analyses. The Brief emphasized policy goals related to safety, reliability and resiliency, cost-effectiveness, affordability, and accessibility. In early 2018, both Consumers and DTE Electric filed plans for the period 2018-2022.

In its April 11, 2018 Commission Order, the MPSC seeks (1) to gather additional input related to filed plans for Consumers and DTE Electric, (2) to consider how the information in these plans can inform ratemaking and other regulatory processes, and (3) to consider the role of performance-based metrics.

## II. Review of filed 5-Year Plans

In reviewing the plans of Consumers and DTE Electric, we used the MPSC's Issue Brief to establish criteria. As noted, each utility was required to issue a plan with the following information:

- A detailed description of distribution system conditions, including age of equipment
- System goals and related reliability metrics
- Expected needs of customers using the distribution system
- Maintenance and upgrade plans
- Cost/benefit analyses

The plans should be framed to support the MPSC's overarching goals including safety, reliability and resiliency, cost-effectiveness, affordability, and accessibility.

### A. Consumers Energy

Consumers' vision for its distribution system is "customer-driven," and anticipates a system that will accommodate more distributed sources of electric supply. Consumers proposes 14 customer-driven metrics related to five objectives: safety and security, reliability, sustainability, customer control, and optimization of long-term system costs. Near-term objectives focus on maintenance and optimization of existing infrastructure while beginning customer-focused enhancements.

**Description of system conditions.** In explaining its vision for the distribution grid, Consumers defines customer value through safety and security, control, sustainability, system cost, and reliability. Consumers provides extensive information regarding system performance, with special attention to consumer outages. We are encouraged by Consumers' use of benchmarking to provide perspective on system conditions.

The plan's description, while granular with respect to outages and certain performance aspects, such as geographic dispersion of performance and poor-performing circuits, is somewhat limited. We hope that future plans will provide improved visibility for stakeholders into other system conditions. A transparent, complete picture of grid conditions will help save time and cost in the siting and deployment of future DER projects. Michigan EIBC and AEE members include renewable energy developers who would like to interconnect projects into the grid and DER installers who work directly with customers will be able to more efficiently and cost-effectively deploy projects if they have a complete understanding of current system conditions.

System goals and reliability metrics. The current plan should be enhanced to illustrate a wider range of customer values derived from the system (which are also system conditions). As noted above, the plan proposes 14 metrics in pursuit of Consumers' system vision. Of the proposed metrics in the filed plan, two control metrics are customer-facing: (1) percentage of residential survey respondents rating Consumers highly on efforts to help control usage; and (2) number of residential customers enrolled in Peak Power Savers® programs.

We hope future 5-Year Plans will be "Increasingly granular to measure the specific, individualized experiences of customers as well as localized circuit-level performance to allow [Consumers] to more surgically identify and address issues." (p. 14). Consumers' wide deployment of advanced metering infrastructure can be utilized to show additional customer experiences beyond outages. As customers have a growing amount of data to inform decisions, we encourage Consumers to address additional aspects of system conditions in future 5-Year Plans. Benchmarking other aspects of customer experiences, such as customer satisfaction with specific utility programs and customer data access and empowerment and application efforts, could provide very useful information to stakeholders.

Expected needs of customers. Consumers' plan relates to two areas under the vision of customer control: enabling increased utility- and customer-owned DERs and increased satisfaction with customer programs. Related to DERs, Consumers states, "Based on current trends, we believe customers will continue to adopt DERs, and these adoption rates will accelerate…" (p. 48). Given the cost trends in DERs, including battery storage, distributed generation and EVs, and expansions in the advanced energy industry, we wholeheartedly agree with this statement. We encourage Consumers to expand upon this in future filings, including providing transparent information to stakeholders related to this trend data. For example, the existing 5-Year Plan does not provide details about DER forecasting methodologies. Related to increased customer satisfaction, relatively few customer-facing programs or applications are transparent within the plan. We anticipate

that with increased data access and control, as envisioned in the plan, future 5-Year Plans will include discussion of more utility and third-party driven customer applications.

Maintenance and upgrade plans. Over the next five years, Consumers proposes to invest more than $3 billion in its distribution grid. We are encouraged by Consumers' increasing use of advanced energy technologies, such as voltage management, advanced metering capabilities, and others, in its vision for future system designs. With respect to MPSC goals, a considerable amount of the plan appears to be focused on reliability improvements rather than other goals of modern DSP, such as DER integration. We recommend that Consumers take a comprehensive approach to evaluating the benefits that these considerable investments could create, and work to ensure that investments are consistent with the expected future needs of its customers.

Michigan EIBC and AEE Institute encourage Consumers to increase its focus on the development of data provision and creating customer-facing value. While we agree that advancing operational excellence will bring consumer benefits, the existing AMI infrastructure provides the potential for significant consumer value and significantly expanded third-party value propositions.

Cost/benefit analyses. Consumers' filing provides little explicit information with respect to cost/benefit analysis. We believe cost/benefit analysis plays a critical role in transparent DSP discussions and decision-making. Future plans should provide stakeholders and the MPSC with more explicit information on cost/benefit methodologies and calculations. Further, the MPSC and stakeholders can work with Consumers to provide cost/benefit quantification and analysis related to important policy outcomes. The current filing could be improved by adding explicit calculations related to the Commission's DSP objectives.

Additional comments. We look forward to Consumers providing more data and transparency in related proceedings at the MPSC. While the plan is intended to be customer-driven, it is not yet clear how customers may drive future 5-Year Plans. Customers engaged through data, effective programs, technologies, and communications can deliver considerable benefits to the grid, grid operators, and society. We look forward to engaging with Consumers to facilitate a robust customer-driven vision.

### B. DTE Electric

DTE Electric developed its Distribution Investment and Maintenance Plan, designing a system that reduces risks, improves reliability, and manages costs. The four pillars of the plan are tree trimming, infrastructure resilience and hardening, infrastructure redesign, and technology and automation. DTE Electric plans to invest nearly $4.2 billion of capital in the next five years. The clear focus of the plan is to address challenges DTE Electric faces related to aging infrastructure.

**Description of system conditions.** DTE Electric worked with industry experts to develop benchmarking for critical areas of concerns regarding operations and maintenance. The plan also provides detailed information about system technologies. In particular, Exhibit 4.1, which depicts asset ages across a wide class of grid technologies, indicates that a wide range of DTE Electric assets are, on average, near or past their design life expectancy.

**System goals and reliability metrics.** The plan focuses on system goals of reducing risk, improving reliability, and managing costs. DTE Electric plans to continue use of industry benchmarking to develop targets for operational and reliability metrics. However, the plan provides limited transparency into metrics and benchmarking, beyond traditional reliability metrics.

We encourage DTE Electric in rate cases and future 5-Year Plans to describe the ways in which technology and market trends impact how the system goals will be realized. Given the significant decreases in cost for advanced energy technologies, including storage and other DERs, it is important that the utility factor these trends into their plans. System goals may also be assessed relative to MPSC objectives, and technology and market trends. For example, DTE Electric notes several customer benefits from advanced metering infrastructure. Of the seven customer benefits identified related to AMI, most are associated with utility operations in carrying out customer interactions. One of the proposed benefits is improved customer data usage, which presents a significant opportunity for consumer engagement. It is important that DTE Electric explore this benefit and other customer benefits to a greater degree than was done in the current filing.

**Expected needs of customers.** DTE Electric's plan does not include explicit discussion of the needs of customers. Of note, the plan and proposed spending are significantly skewed toward system upgrades. The plan notes customer-facing improvements, but lacks detail and committed spending towards these investments. The implication is that customers will benefit from an improved infrastructure. It is implied that addressing risk, reliability, and cost translate to improved customer experiences. Of the areas of the Distribution Investment and Maintenance Framework, technology and automation are the only areas of customer-facing investment. In particular, DTE Electric aims to upgrade smart meter networks and improve DER integration. To get the most out of these sizeable investments, future plans should explicitly address customer trends and characterization of customer options.

**Maintenance and upgrade plans.** Most of the plan focuses on significant system upgrades to the aging grid infrastructure. We recognize the challenges DTE Electric has in operating over an extensive distribution system on behalf of over 2.2 million Michigan customers. We also recognize that DTE's aging infrastructure poses significant challenges.

**Cost/benefit analyses.** DTE Electric prioritized and ranked the top fifty capital programs and projects (Exhibit 2.5.5). To prioritize these projects, impact dimensions were considered addressing safety, load relief, regulatory compliance, substation outage risk, reliability, operations and maintenance costs, and reactive capital (Exhibit 2.5.1.). The quantified benefit-cost ratios differ across impact dimensions of the programs. A program's benefit-cost score was calculated by summing a weighted total across all impact dimensions (Exhibit 2.5.3.). It should be noted that the impact dimensions and impact dimension weights used in DTE's cost/benefit framework are connected to the company's strategic objectives, not necessarily MPSC policy objectives of 5-Year Plans.

**Additional comments.** As noted above, the plan and proposed spending are significantly skewed toward system upgrades. The plan notes but lacks details and committed spending towards customer-facing improvements. The implication is that customers will benefit from an improved infrastructure. While we do not disagree with that implication, we are concerned that customer-facing spending is insignificant in this plan. Of the proposed $4.2 billion in spending outlined in the plan, only between $7 and13 million is dedicated toward customer-facing programs. Given the Commission's policy objectives, market trends, and the range of advanced energy technology offerings available to customers, this low level of spending is concerning.

We look forward to DTE Electric providing more data in related proceedings, such as forthcoming rate cases. We are encouraged by some of the transparency in the 5-Year Plan, including insight into DTE Electric's decision-making priorities.

## III. Recommendations for improvements and opportunities for future DSP

### A. Recommended DSP improvements

There is no one-size-fits-all approach to distribution system planning. States have different policy objectives, levels of DER adoption, and market participation constructs. Thus, DSP processes must facilitate planning appropriate for Michigan's circumstances. Still, many states and jurisdictions are developing more transparent approaches to electric utility distribution planning. These approaches open planning and decision-making processes to meaningful stakeholder engagement, while ensuring strengthened public oversight over significant distribution system expenditures. Such an approach encourages longer-term planning, ensures that planning processes have the most up to date information on DER cost, performance and functionality and brings visibility and accountability to decision-making around infrastructure proposals. We believe the following data are important for stakeholders:

Distribution system characteristics

- Existing distribution characteristics at substation and feeder-level — coincident & non-coincident peaks, capacity levels, outage data, projected investment needs
- Generation production characteristics, including those associated with variable resources
- Existing combined heat and power installations
- Hosting capacity at substation and feeder level

Distribution planning data

- Customer distributed generation/DER adoption forecasts
- Other (non-DG) customer DER adoption forecasts
- Distribution planning load forecasts, based on proposed forecasting scenarios[3]

Modern DSP requires that both customer data and system data be made available, while accounting for legitimate privacy and security concerns. We support the use of standard, downloadable formats for data, including, but not limited to, the use of Green Button for customer data. Data sharing protocols should be non-proprietary and easily actionable by stakeholders. These data are also vital for engagement in related MPSC proceedings, such as rate cases. It is essential that members of the advanced energy industry and customers are able to engage effectively and efficiently with the distribution system and utilities. This requires the availability of accurate, transparent information about the distribution system. The MPSC may note that filed plans vary in the extent to which this data is provided.

Additionally, data should be shared in a way that ensures that customer trade secrets or individuals' personal identifiable information are not at risk. Further, data sharing should clearly relate to objectives and/or Commission principles. All data sharing should appropriately consider data characteristics, risks, and vulnerabilities.

A more advanced DSP structure reframes decision-making to be proactive and longer-term while emphasizing transparency and stakeholder engagement. DSP presents an opportunity for increased benefits through collaboration and realization of the full potential of a modern grid.

**Development of standardized requirements of 5-Year Plans to ensure a consistent but flexible planning processes.** We support the development and use of more uniform 5-Year

[3] These recommendations are consistent with California Public Utilities Commission guidance on distribution system planning: California Public Utilities Commission. Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769. Draft Guidance for use in Utility AB 326 Section 769 Distribution System Plans. P 20 URL: http://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=5107

Plan requirements. Future plans can be directed towards consistencies related to (1) stakeholder engagement processes, and (2) tools and methodologies.

First, stakeholder engagement processes should be open and transparent, and uniform across utilities. General data needs will be consistent. For example, system and customer data, generalized modeling assumptions, and potential modeling scenarios can be shared with stakeholders. Below we offer some perspectives on opportunities to develop uniform yet flexible 5-Year Planning processes.

Standardization will improve outcomes by making it more efficient for stakeholders to participate in individual planning processes and offer appropriate solutions. We recognize that Michigan's utilities are at different stages of development with respect to the use of various tools. In a recent analysis, the staff of the Minnesota Public Utilities Commission (MNPUC) proposed similar, but adjusted processes for each regulated utility. MNPUC staff then proposed Draft Integrated Distribution Planning Requirements for each regulated utility.[4] Planning requirements included baseline distribution system and financial data requirements of each utility. We see this type of uniform requirements, with appropriate adjustments, as practical and important.

**Creation of a uniform benefit/cost analysis framework.** We recommend the development of a benefit-cost analysis (BCA) framework to adequately compare the costs and benefits of all potential resources against each other in proposed 5-Year Plans. The BCA framework should align with public policy objectives. Policy objectives may cross regulatory areas, such as meeting state renewable portfolio standards, reducing barriers to new technologies, and ensuring customer benefits from investments. Such a framework may include assessing a wide range of technologies as well as appropriate inclusion of societal benefits.

In building a BCA framework, existing practices should be relied upon, such as utility experience with evaluation, measurement, and verification. Many states apply proxies for energy efficiency program assessments that can serve as models.[5] In 2017, E4TheFuture, published the National Standard Practice Manual (NSPM),[6] which builds upon state experiences to provide a comprehensive framework to evaluate the cost effectiveness of energy resources. If certain technologies are to be incentivized, Michigan would also

[4] See Minnesota Public Utilities Commission Staff Briefing Paper - appendices include sample filing requirements:
https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={D0CBB562-0000-C451-8A68-3429CA26DB87}&documentTitle=20184-141827-03

[5] In September 2014, Synapse Energy Economics prepared a report for AEE Institute titled *Benefit-Cost Analysis for Distributed Energy Resources: A Framework for Accounting for All Relevant Costs and Benefits.* In this report, AEE Institute proposed a benefit-cost framework for New York state; however, much of the report is broadly applicable to other states.

[6] E4TheFuture (2017) National Standard Practice Manual (1st ed) May 18, 2017. https://nationalefficiencyscreening.org/national-standard-practice-manual/ accessed 4/30/18.

benefit from the National Association of Regulatory Utility Commissioners (NARUC) Manual on Distributed Energy Resources Rate Design and Compensation (NARUC DER Manual).[7] The NSPM, NARUC DER Manual and similar frameworks provide each state flexibility to ensure that the BCA tests they use meet their state's distinct needs and interests.

**Consideration of multiple probabilistic load forecast and distributed energy resources scenarios.** Forecasting within 5-Year Plans should include more granular projections of DER potential and likely customer adoption. Forecasts should include robust scenario analysis and probabilistic planning of DER penetration. Stakeholders should be allowed to provide sufficient input to ensure a thorough understanding of future risks and opportunities. Further, we recommend developing assumptions about explorations of scenarios, and making all resources available for inclusion in the scenarios, as opposed to including technology-specific scenarios. DER represent a resource available for forecast modeling, and their deployment should not be modeled as a load modification. In many cases, DER can be a least cost resource. We also recommend that probabilistic analysis not just be limited to DER, but used more broadly, for example, in defining future load growth scenarios.

Stakeholder input is essential in building planning scenarios. The Commission should rely on broad stakeholder input for building scenario and forecast assumptions. Utilities may not have full, up-to-date information about DER cost and performance, as well as planned DER deployment at the distribution level. Stakeholder input can also help with development of the macroeconomic and other broad assumptions that help define different scenarios. To identify relevant planning scenarios, utilities should ensure that scenarios are aligned with the state's public policy goals. Relatedly, the MPSC is set for a stakeholder process as required in integrated resource planning (IRP) to develop IRP scenarios. We can imagine a similar process being helpful for 5-Year Plans. The basic principles, assumptions and data should be common for utility planning scenarios. However, scenarios should be adjusted based on utility-specific circumstances. For example, utilities may have differing obligations under renewable portfolio standards and should model scenarios fit for their specific compliance obligations.

**Requirements for detailed hosting capacity analyses to identify system improvement opportunities.** All utilities should advance the capabilities of their hosting capacity tools as quickly as possible. Hosting capacity is used to determine the amount of DER that the distribution system can accommodate at any time at any location. Further, hosting capacity information must be sufficiently granular to invite stakeholder solutions. This information must be nodal, and indicate where hosting capacity is available, and for which type of

[7] National Association of Regulatory Utility Commissioners (2016). NARUC Manual on Distributed Energy Resources Rate Design and Compensation. November 2016. https://pubs.naruc.org/pub.cfm?id=19FDF48B-AA57-5160-DBA1-BE2E9C2F7EA0 accessed 4/30/18

technological capabilities. The hosting capacity of a circuit depends on the types and capabilities of technologies that may interconnect at that specific node.[8] As such, finer-grained forecasting of DER deployment and system/infrastructure stress will be necessary in future 5-Year Plans.

**Use of uniform DER interconnection studies.** The proposed interconnection of a particular DER often poses a challenge, an opportunity, or some combination of both. Opening up data access to allow third-parties to make use of such an evaluation is a critical component in streamlining interconnection. Standard interconnection procedures and data sharing leverages the expertise of third-parties in locating DERs and obtaining the full range of benefits from integration. DSP allows the utility to better avoid costly mistakes, thereby making their planning more efficient and effective, and saving ratepayers money.

Many states are developing and using hosting capacity maps, with indicators of interconnection costs and queues, including Hawaii, New York, California, and Maryland. These maps, updated regularly, make the data available and actionable to other stakeholders. It is critical that Michigan's utilities develop similarly accurate, updated, and publicly available maps.

**Application of appropriate of standards and codes for the enhanced integration of DER into DSP and operations.** Standards are a critical part of integrating DER into distribution systems. Related to DSP, at least two categories of standards are important: 1) interconnection standards, and 2) interoperability standards.

A standardized and streamlined interconnection process helps to efficiently enable new generator connections, reduces interconnection costs, ensures grid reliability, and avoids undue discrimination.[9] Interconnection standards may also interact across and between state and federal jurisdictions. Thus, development of interconnection standards and interconnection processes should include input from Federal Energy Regulatory Commission standards[10] and Midcontinent ISO standards,[11] where applicable.

For technical interconnection standards, much of the industry has mature guidance. For example, the Institute of Electrical and Electronics Engineers (IEEE) series of 1547 standards address interconnection of DER with the grid. IEEE 1547 provides mandatory functional

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[8] Clements, A. (Producer) (2017, Nov 15) Hosting Capacity is the New Black. *Grid Geeks.* [Audio podcast]. Retrieved from www.goodgrid.net/blog/2017/11/15/grid-geeks-podcast-s2e7 accessed 4/30/18

[9] Rauch, Jason N. Renewable Generator Interconnection. U.S. Agency for International Development/National Association of Regulatory Utility Commissioners. March 24, 2014. Accessed June 19, 2017. URL: http://pubs.naruc.org/pub/5381D31C-2354-D714-51ED-08FD965CF29D

[10] For example, FERC Orders 2003, 2006, 661; Standard Interconnection Agreements and Procedures for Small Generators https://www.ferc.gov/industries/electric/indus-act/gi/small-gen.asp

[11] MISO Generator Interconnection information https://www.misoenergy.org/Planning/GeneratorInterconnection/Pages/GeneratorInterconnection.aspx

technical requirements, and presents choices about equipment and operating details for compliance with the standard. Michigan should defer to this standard, and the Commission should ensure 5-Year Plans comply, as applicable.[12]

Second, interoperability standards are increasingly important. Interoperability can be defined as "the capability of two or more networks, systems, devices, applications, or components to share and readily use information securely and effectively with little or no inconvenience to the user."[13] Under the Energy Independence and Security Act of 2007, the National Institute of Standards and Technology (NIST) facilitated the development of significant interoperability standards.

Interoperability crosses jurisdictional, operational, and supply/demand boundaries. It is important that operators of generation, transmission, distribution, and customers all connect in a way that ensures a safe, secure, and reliable grid.

Assessing locational value of DER. Flowing from hosting capacity and interconnection studies, the valuation of DER is critical DSP processes. An examination of the value of DER to the power system demonstrates that distributed resources can provide significant value for all customers through improving system efficiency, capital deferral and supporting wholesale and distribution operations. The key is to consider how DER can solve distribution network problems, and proactively plan for the integration of DER with an understanding of the opportunities and challenges involved.

Multiple states are considering valuation proceedings. Unlocking the full value of resources through re-thinking markets and regulatory innovation is a stated goal of two of the more developed DSP efforts underway – the Reforming the Energy Vision (REV) proceeding in New York or the Distribution Resource Planning (DRP) and Integrated Distributed Energy Resources (IDER) proceedings in California.[14] In Minnesota, the Department of Commerce facilitated public workshops to develop a methodology for calculating a value of solar, which is to be embedded in utility tariff proposals. We see opportunity for these discussions to be facilitated through MSPC processes, such as the 5-Year Plans.

### B. Potential DSP procedural implications

The Commission sought feedback in its April 11 Order regarding how the information in 5-Year Plans can help inform ratemaking and other regulatory processes. Future 5-Year Plans should increase alignment with related MPSC proceedings. We believe that processes

[12] For more information, see Basso, Thomas S. IEEE 1547 and 2030 standards for distributed energy resources interconnection and interoperability with the electricity grid. Vol. 15013. National Renewable Energy Laboratory, 2014. URL: http://www.nrel.gov/docs/fy15osti/63157.pdf

[13] Department of Energy. Smartgrid.gov - What is the Smart Grid: Standards and Interoperability. Accessed June 19, 2017. https://www.smartgrid.gov/recovery_act/overview/standards_interoperability.html

[14] Bode, J., Lemarchand, A., & Schellenberg, J. (2016). Beyond the Meter: Addressing the Locational Valuation Challenge for Distributed Energy Resources, p. 5

should be as consistent and connected as is practical. While 5-Year Plans are not likely to be merged with other regulatory proceedings, there are explicit and general connections and practices that can be used to ensure consistent data across MPSC proceedings.

We believe that many regulatory proceedings including 5-Year Plans will require consistent inputs, including for load forecasts, DER deployment and capacity needs. If and where inputs may differ, utilities should explain the basis for those differences in 5-Year Plans. In a recent proceeding in Minnesota, the MNPUC solicited feedback from stakeholders on how to appropriately integrate DSP information with other MNPUC processes. Utilities indicated that three processes inform each other: integrated resource plans, transmission plans, and distribution plans. In a MNPUC Staff Briefing Paper, staff notes that "inputs to any process should be consistent as practicable."[15] Implementation of Public Acts 341 and 342 imposed new or adjusted requirements related to utility rate cases, electric choice, certificate of necessity, and electric capacity resource adequacy, and established a revised integrated resource planning process. The data requirements should be as consistent as possible across all of these processes and proceedings, including 5-Year Plans.

In the long run, the 5-Year Plans may be approached much like an IRP or a renewable energy plan. In this scenario, a 5-Year Plan must be subject to a contested proceeding, but once that proceeding is completed and the plan is approved or approved as modified, then cost recovery should be assumed and "flow-through" to general rate cases. However, the current plans were not intended for contested cases and should not be used as a basis for cost recovery in upcoming rate cases, except to the extent that any implementation costs are subject to full review in those rate cases.

We also encourage MPSC staff to consider if state statutes require some level of integrated planning between existing regulatory processes. Such integration would enable more efficient use of limited MPSC staff resources, limited capabilities of many stakeholder groups, and resources of regulated utilities.

### C. Potential for DSP and Performance-Based Regulation

Act 341 of 2016 charged the Commission to study performance-based regulation (PBR). The Report on the Study of Performance-Based Regulation (hereafter "PBR Report") was the result of a stakeholder process. Within Act 341, PBR is defined "as a regulatory system in which a utility's authorized rate of return would depend on the utility achieving targeted policy outcomes. Such outcomes could relate to cost control, customer service, reliability,

[15] Minnesota Public Utilities Commission. Staff Briefing Papers April 19, 2018. Cases: E999/CI-15-556 E002/CI-18-251, E017/CI-18-253, E015/CI-18-254, E111/CI-18-255 https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={D0CBB562-0000-C451-8A68-3429CA26DB87}&documentTitle=20184-141827-03 Accessed 4/30/18

safety, innovation, environmental performance, or other considerations."[16] Act 341 also directed the MPSC to examine potential applications of PBR. In completing the PBR Report, the MPSC was directed to evaluate four factors:

> 1. Methods for estimating revenue needed during a multi-year pricing period that uses forecasts of efficient total expenditures, i.e., TOTEX as used in the UK RIIO model;[17]
>
> 2. Methods to increase the time between rate cases to provide the utility with the opportunity to retain cost savings and to encourage investments that have extended payback periods;
>
> 3. Options (i.e., mechanisms) for establishing incentives and penalties that pertain to customer satisfaction, safety, reliability, environmental impact, and social obligations; and,
>
> 4. Profit sharing provisions that can spread efficiency gains among consumers and utility stockholders and reduce the degree of downside risk associated with innovation.[18]

Both Michigan EIBC and AEE Institute support the use of PBR in Michigan. We believe that PBR can serve as a foundational regulatory framework of the electric grid of the future. Future infrastructure investments must be judged based on the value delivered by and through those investments. We recognize that there is no one-size-fits-all solution for PBR deployment. In implementing PBR, AEE recommends a basic framework of factors and steps,[19] many of which the MPSC has already addressed. Table 1 below provides a summary of those factors/steps, notes whether those factors/steps are addressed within the MPSC PBR report, and indicates how those factors/steps relate to future 5-Year Plan filings.

**Establishing authority to implement PBR.** Jurisdictions may have unique circumstances, including legal, institutional, utility, and financial market considerations. The PBR Report notes important enabling legislation related to economic regulation of public utilities in Michigan. PBR is viewed as an option for the MPSC to adapt to drivers of change, including evolving policy goals.

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[16] Michigan Public Service Commission (2018). *Report on the Study of Performance-Based Regulation.* April 20, 2018. https://www.michigan.gov/documents/mpsc/MI_PBR_Report_Final_621112_7.pdf

[17] UK office of Gas and Electricity Markets (Ofgem) Revenue=Incentives+Innovation+Outputs

[18] Ibid. p. 5.

[19] Advanced Energy Economy (2017) Performance Based Regulation- Aligning utility incentives with policy objectives and customer benefits. A 21st Century Electricity System Issue Brief. September 2017. https://info.aee.net/hubfs/PDF/PBR.pdf accessed 4/30/18

Given the MPSC's wide authority over economic regulation of public utilities, PBR is appropriate for discussion within 5-Year Plan development. Future 5-Year Plans may identify drivers of industry change.

**Stakeholder engagement.** The October 11, 2017 MPSC Supplemental Order and Issue Brief on DSP notes that the Commission has a long-term expectation that a stakeholder-based distribution planning effort will provide a variety of benefits. Many of those benefits can be achieved by providing stakeholders and utilities opportunities to appropriately structure utility incentives toward delivering benefits (outputs). Future 5-Year Plan processes should ensure stakeholders are part of establishing the critical aspects of PBR plans – such as setting performance targets and incentives.

**Defining performance.** To implement PBR, legislators, regulators, and stakeholders should work together to define, prioritize, and incentivize desired performance. Act 341 notes that PBR may pertain to customer satisfaction, safety, reliability, environmental impact, and social obligations. Those areas of performance are discussed in the PBR Report in terms of output goals. Many of these output goals are facilitated, explicitly or implicitly, through 5-Year Plan processes and the MPSC may direct utilities to align plans to prioritize certain areas of performance. An explicit linkage between PBR and future 5-Year Plans will help stakeholders focus on priority performance outcomes.

**Establishing metrics and incentives.** Generally, performance targets and metrics should be designed around the most important, forward-looking assumptions that impact the business case of a proposed utility investment. The MPSC did not direct performance metrics to be developed in the current 5-Year Plans. However, as part of the stakeholder process for future 5-Year Plans, performance metrics should be developed. Incentives should be provided when a utility achieves certain goals (outputs). Utilities, stakeholders, and regulatory staff must also develop expertise in incentives related to PBR metrics.

**Planning in the PBR context.** The PBR Report outlines specific output goals. These outputs, including new incentives, need to be considered in the context of input incentives. The PBR Report notes that a mix of cost-of-service and performance incentives is possible. Potential synergies exist with rate plans and 5-Year Plans. Future 5-Year Plans should include explicit discussion of how planning processes foresee an appropriate mix of inputs related to desired outputs. Any new output incentives need to be considered in the context of the input incentives.

**Optimizing between capital and operating expenses.** Operating expenses should increasingly be considered on equal footing with capital investments, particularly when non-capital spending can provide a superior solution to a traditional utility investment. For example, cloud computing services are seen as superior to utilities investing in their own servers and software. But utilities are discouraged from contracting for cloud computing

services since they cannot earn a return, as they do when they invest in their own IT equipment. Non-wires alternatives is another example of where there are potential benefits to equalizing earning opportunities between utility capital investments and services. If PBR provides earnings for non-capital solutions, a specific outcome should result from the deployment of a non-capital solution.[20]

**Prioritizing metrics and learning.** Prioritization is necessary to make the implementation of PBR manageable. In guiding decisions on successful implementation of PBR mechanisms, we agree with many of the characteristics outlined for Michigan by the Regulatory Assistance Project.[21] In particular, it is important to align utility outputs and desired outcomes. Metrics should come from experience, be transparent, clear and measurable, be evaluable and verifiable, and offer all stakeholders opportunities to learn from experience as goals and performance outputs evolve. Metrics must also ensure public and utility value are fully considered.

**Potential performance metrics.** Performance metrics within 5-Year Plans should align with MPSC stated categories of performance: safety, reliability and resilience, cost-effectiveness, affordability, and accessibility. In considering potential performance metrics, we recommend that metrics (1) lend themselves to near-term implementation, and (2) inform multiple categories of performance. We believe these provide the best opportunity for the Commission to take practical and meaningful action related to PBR. Table 2 below summarizes potential metrics, which are both implementable in the near term, and are linked to the 5-Year Plan objectives as outlined by the MPSC in both the October 11, 2017 Supplemental Order and Issue Brief. MPSC selected performance metrics must also reflect the ability of the utilities to control activity directly linked to output goals. Below are some examples of performance metrics that could be considered.

***System Efficiency.*** It is important to track how a utility is building out its system. System efficiency is related to both operational excellence (output) and effective use of capital (inputs). System efficiency improvements for utilities result from a combination of peak demand reduction and average system utilization. An example metric is measured by peak load reduction and peak load divided by average load. Measuring both peak load reduction and the peak to average ratio would provide information about effective deployment of reduction technologies (e.g., DER and demand response), energy efficiency, and energy storage. A focus on system efficiency can create opportunities for multiple DER

[20] Advanced Energy Economy Institute (2018) Utility Earnings in a Service-Oriented World- Optimizing Incentives for Capital- and Service-Based Solutions. January 30, 2018. https://info.aee.net/hubfs/AEE%20Institute_Utility%20Earnings%20FINAL_Rpt_1.30.18.pdf accessed 4/30/18

[21] Litell, D. and Shipley, J. (2017) Performance-Based Regulation Options: White Paper for the Michigan Public Service Commission. Regulatory Assistance Project. July 2017. https://www.michigan.gov/documents/mpsc/RAP_PBR_options_for_MI_PSC_7_14_17_579246_7.pdf Accessed 4/29/18

technologies. System efficiency measures reflect system reliability alongside existing metrics, such as traditional outage statistics, while implying cost-effective use of capital and maintaining affordability.

*Interconnection*. The number of interconnection requests, and appropriate processing of those requests (e.g., timeliness) are important utility responsibilities. Interconnection of advanced energy technologies reflects system accessibility, which the MPSC noted as important for 5-year plans. The interconnection of DERs could improve reliability and resilience for the utility (with the notion that a more distributed grid is a more resilient one). It is also assumed that interconnection processes appropriately review safety implications for utilities and customers. Interconnection, alongside hosting capacity analysis, reflects a critical utility role in planning.

Table 1: Performance-Based Regulation in 5-Year Distribution System Plans

| PBR Implementation Needs[22,23] | MPSC 2018 PBR report | Relationship to Future 5-Year Distribution System Plans |
|---|---|---|
| **Establishing authority to implement PBR.** Jurisdictions may have unique circumstances, including legal, institutional, utility, and financial market considerations. | ✓ | The MPSC PBR report notes relevant enabling legislation. Sections of Act 341 indicate areas of performance and relevant mechanisms for implementing PBR. Future plans should include important legal, institutional, utility and financial market considerations. |
| **Stakeholder engagement.** Regulatory processes should ensure stakeholders are part of establishing the critical aspects of PBR plans – such as setting performance targets and incentives. | - | The MPSC is seeking stakeholder input in the current proceeding. Future plans should indicate stakeholder opportunities and concerns in setting appropriate performance targets, including proposing new metrics.[24] |
| **Defining Performance.** To implement PBR, legislators, regulators, and stakeholders should work together to define, prioritize, and incentivize desired performance. | ✓ | Act 341 and the MPSC note that PBR may pertain to customer satisfaction, safety, reliability, environmental impact, and social obligations. The MPSC may direct utilities to align plans with priority areas of performance. |
| **Establishing Metrics and Incentives.** Generally, performance targets and metrics should be designed around the most important, forward-looking assumptions that impact the business case of a proposed utility investment. | - | The current proceeding seeks to identify metrics related to DSP proceedings. Although metric categories should be similar for all utilities in a jurisdiction, actual targets can vary from utility to utility to reflect differences in the customer base, system condition, or other factors within 5-Year Plans. |
| **Planning in the PBR Context.** Incentives are provided when a utility achieves certain goals (outputs). Planning for outputs connects inputs (investments) with future outputs. | ✓ | PBR Report recommends the use of multi-year rate plans. Potential synergies exist with rate plans and 5-year distribution plans. Any new output incentives need to be considered in the context of the input incentives. |
| **Optimizing Between Capital and Operating Expenses.** Operating expenses on equal footing with capital investments, particularly when non-capital spending can provide a superior solution. | ✓ | PBR Report notes that approaches to optimize overall capital expenditures and operating costs could complement the existing regulatory model. Future plans should include this optimization as part of utility cost/benefit analyses. |
| **Prioritizing Metrics and Learning.** Prioritization is necessary to make the implementation of PBR manageable. | - | The current proceeding engages stakeholders toward developing initial PBR metrics. Regulators and other stakeholders should focus performance objectives where there is most need for improvement as identified within DSP processes, where there are opportunities to pursue regulatory priorities, and where there is opportunity for change. |

[22] Applied from Stafford, B. and Frantzis, L. (2018). Performance-based regulation: Aligning utility incentives with policy objectives and customer benefits. Utility Dive. October 5, 2017. https://www.utilitydive.com/news/performance-based-regulation-aligning-utility-incentives-with-policy-objec/506498/ Accessed 4/29/18

[23] Advanced Energy Economy (2018). Performance-Based Regulation: Aligning utility incentives with policy objectives and customer benefits- a 21st Century Electricity System Issue Brief. https://info.aee.net/hubfs/PDF/PBR.pdf Accessed 4/29/18

[24] A separate PBR metric process may be necessary. As the Commission notes in the report in relation to the UK RIIO model "If Michigan were to move toward a similarly ambitious performance incentive regime it would likely require a similar regulatory review and stakeholder engagement over a multi-year timeframe." (at p. 21)

Table 2: Potential Performance Metrics for Michigan

| Metric | Description | Safety | Reliability & resilience | Cost-effectiveness | Affordability | Accessibility | Sample Metrics |
|---|---|---|---|---|---|---|---|
| System Efficiency | Combination of peak demand reduction and average system utilization | | ✓ | ✓ | ✓ | | • Peak load reduction (% or MW)<br>• Ratio of average load to peak load (load factor) |
| Interconnection | Volume and process speed of filling requests to connect resources to the electricity system | ✓ | ✓ | | | ✓ | • Speed of processing valid interconnection requests<br>• User satisfaction with interconnection process |
| Reach, Usage, Effectiveness, Feedback | Framework for customer empowerment metrics | | | ✓ | ✓ | ✓ | • Percentage customers that has access to customer engagement communication • Number of customer interactions |
| Data Access | Consumer access to standardized and actionable energy consumption data; Third-party access to system data | | ✓ | ✓ | ✓ | ✓ | • Timeliness of data request responses<br>• Automation of data exchanges<br>• Ability to access data through self-service tools or APIs |
| Energy Waste Reduction (EWR) | Quantifiable reductions in usage, including periods of peak demand, related to outcome goals beyond EWR compliance | | ✓ | ✓ | ✓ | ✓ | • kWh and thermal reductions relative to baseline (gross or per capita) |

## Conclusion

We applaud the Commission for beginning an important discussion with Michigan stakeholders through the 5-Year Plan process. We thank the Commissioners and staff for their continued hard work in making system planning at all levels more transparent, data-driven, and inclusive. Michigan's electricity grids deliver essential services to the businesses and citizens of the state. The distribution system infrastructure that delivers electricity is risking increased equipment failure and an inability to adapt to trends in policy, markets, and technologies that can provide great benefits. Those benefits must also be weighed against potential cost increases as outdated infrastructure is replaced.

A core element of modern DSP processes should be providing improved information to customers, regulators, and third parties to create a common discussion and enable non-utility stakeholders, including the advanced energy industry, to propose solutions to grid needs. We strongly believe that Michigan stakeholders must continue to be engaged to understand longer-term investment strategies, costs, benefits, and options in investing in a modern distribution grid. We encourage the Commission to continue to refine 5-Year Plan requirements and processes to facilitate stakeholder engagement. We also recommend that the MPSC consider opportunities for the use of performance-based regulation and related mechanisms, such as metrics and incentives. Lastly, we believe the information in 5-Year Plans is connected to several related MPSC processes and procedures, and future requirements should make those connections clear.

Michigan EIBC and AEE Institute appreciate the opportunity to submit these comments. We look forward to further opportunities to contribute to the Commission's important work related to grid modernization.