

# Utility Regulatory Measures to Improve Electric Reliability in Michigan

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March 2020

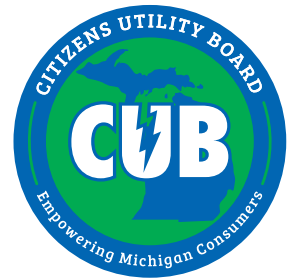


## **The Citizens Utility Board of Michigan (CUB of MI),**

was formed in 2018 to represent the interests of residential energy customers across the state of Michigan. CUB of MI educates and engages Michigan consumers in support of cost-effective investment in energy efficiency and renewable energy and against unfair rate increase requests.

CUB of MI gives a voice to Michigan utility customers and helps to ensure that citizens of the state pay the lowest reasonable rate for utility services and also benefit from the environmental implications of investment in clean energy. CUB of MI is a nonpartisan, nonprofit organization whose members are individual residential customers of Michigan's energy utilities.

**For more information, visit [cubofmichigan.org](http://cubofmichigan.org)**



## **This report was prepared for:**

Citizens Utility Board of Michigan by 5 Lakes Energy. 5 Lakes Energy is a Michigan-based policy consulting firm dedicated to advancing policies and programs that promote clean energy and sound water policy for a resilient environment.

**For more information, visit [5lakesenergy.com](http://5lakesenergy.com)**



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# INTRODUCTION

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**R**eliability is a critical attribute of high-quality electric utility service. The electric utility customer's expectations that power outages and interruptions be 1) rare and 2) alleviated as quickly as possible when they do happen are foundational to the utility-customer relationship. The failure to deliver on these expectations is extremely costly for all types of customers. Residential customers will be inconvenienced by short outages but may suffer serious economic costs, health effects, or discomfort as a consequence of extended outages. Support services to residents due to outages can be costly for local governments and social services. Businesses and, consequently, employees, may experience significant loss of income due to outages. For some businesses, such as the digital economy, continuous process manufacturing, and fabrication, reliability is a concern when

considering where to locate facilities because they are particularly sensitive to power fluctuations. Essential services such as telecommunications, water and sewer services, and pipelines rely on electric power for safe operation and the provision of essential services.

One hour of electricity outage on a typical summer weekday costs a large or medium-sized C&I customer \$21,850, and an eight-hour outage costs it \$96,252,<sup>1</sup> according to research from the Lawrence Berkeley National Laboratory. One hour of electricity outage for a residential customer on a typical summer morning or evening costs \$8.40 and an eight-hour outage during summer costs \$24, according to the same study. There generally are far more residences than businesses affected by an outage so that the aggregate cost of residential outages may exceed that of

business outages. As will be addressed later in this paper, those costs are likely only the tip of the iceberg when it comes to the financial impact of outages.

Unfortunately, Michigan utilities have tended to rank among the worst in the country on industry-standard measurements of reliability. Michigan has fallen behind on one of the critical services powering the modern economy, and is suffering financially as a result. The harm was made clear following storms on July 19, 2019, when about 600,000 DTE customers<sup>2</sup> and 220,000 Consumers Energy customers<sup>3</sup> lost power. Many were without power for days – by July 22, about 230,000 DTE customers and 25,000 Consumers Energy customers still had not had service restored<sup>4</sup>, and 14,000 DTE customers were without power by the night of July 23<sup>5</sup>.

<sup>1</sup>Lawrence Berkeley National Laboratory. Updated Value of Service Reliability Estimates for Electric Utility Customers in the United States. Sullivan, Schellenberg and Blundell, January 2015. <https://emp.lbl.gov/sites/all/files/lbnl-6941e.pdf>

<sup>2</sup>Crain's Detroit. "DTE Energy Details What Went Wrong With Power Outage Estimates After Storms." July 26, 2019. <https://www.crainsdetroit.com/energy/dte-energy-details-what-went-wrong-power-outage-estimates-after-storms>

<sup>3</sup>The Detroit News. "DTE: 14k Without Power In 6th Day of Storm-Related Outages." July 23, 2019. <https://www.detroitnews.com/story/news/local/michigan/2019/07/23/dte-91-k-without-power-tuesday/1802274001/>

<sup>4</sup>Detroit Free Press. "Outage Outrage: DTE's Lack of Blackout Restoration Updates Spur Anger." July 22, 2019. <https://www.freep.com/story/news/local/michigan/2019/07/22/dtes-glitchy-blackout-restoration-updates-spur-anger/1797617001/>

<sup>5</sup>The Detroit News. July 23, 2019.

<sup>6</sup>State of Michigan Department of Attorney General. Letter to Michigan Public Service Commission Chairman Sally Talberg. July 25, 2019. [https://www.michigan.gov/documents/ag/2019-07-25\\_AG\\_Ltr\\_to\\_Talberg\\_661577\\_7.pdf](https://www.michigan.gov/documents/ag/2019-07-25_AG_Ltr_to_Talberg_661577_7.pdf)

# INTRODUCTION

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On July 25 Attorney General Dana Nessel sent a letter<sup>6</sup> to Michigan Public Service Commission Chairman Sally Talberg saying that the mass outages demonstrated the importance of reexamining the financial penalties for electric service interruption. Nessel argued that the current system places a burden on customers that is “unacceptable and unnecessary.”

How did the state end up here? One reason is that Michigan’s electric utilities have no specific financial incentive to meet state standards for reliability, nor do they have a strong disincentive when they fail to meet these standards.

This paper explores how the Michigan Public Service Commission can make

utilities accountable for failures to deliver adequate reliability, and as a result incentivize the utilities to better address reliability before outages occur. Many of the recommendations involve the introduction of elements of Performance-Based Regulation (PBR) as a way to align utility incentives with improvements in reliability. An April 2018 report<sup>7</sup> from the MPSC staff stated the Commission’s intention to test various PBR measures. The report specifically mentioned reliability as one of the areas where utility performance targets can be most effective:

Setting reliability goals, performance criteria, or metrics is universally recognized as desirable since it effectuates one of the central public utility service goals: safe

and reliable service. For electric utilities, there are well established reliability metrics and benchmarking data addressing the frequency and duration of power outages.

This paper details exactly what the problem with reliability is for Michigan utility customers, why current regulatory incentives for improving reliability have been ineffective, and exactly what measures the MPSC should take in response. The analysis includes a review of several examples of domestic and international regulatory regimes that currently incorporate metrics of reliability into utility PBR.

<sup>7</sup>Michigan Public Service Commission. Appendices to the Report on the Study of Performance-Based Regulation. April 20, 2018. [https://www.michigan.gov/documents/mpsc/MI\\_PBR\\_Appendices\\_Draft\\_3\\_621113\\_7.pdf](https://www.michigan.gov/documents/mpsc/MI_PBR_Appendices_Draft_3_621113_7.pdf)

# INTRODUCTION

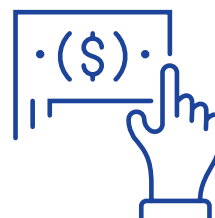
# RECOMMENDATIONS IN BRIEF



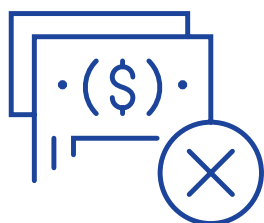
**Update the size of bill credits issued to customers** for unacceptable service and base credits on hours of outage to better reflect the economic cost of loss of service.



**Require utilities to provide more information about outages** to customers on both their bills and in digital formats so customers know when they are eligible for bill credits and utilities are held accountable.



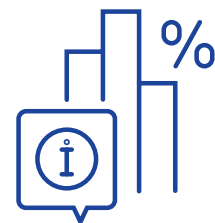
**Require that utilities automatically issue bill credits owed** to customers following outages that violate state standards for electricity service.



**Limit cost recovery of bill credits** based on the utility's performance relative to national reliability metrics.



**Create goals for utilities to improve** the rate at which they compensate customers who experience outages in violation of state distribution standards, and penalize utilities who fail to meet these goals by reducing their ROE.



**Study how to move toward a more robust PBR approach** that would include rewards/penalties for utilities exceeding/missing a number of targets.

# ELECTRIC RELIABILITY IN MICHIGAN



**M**ichigan consistently ranks near the bottom of states, both nationally and in its region, in terms of the average time to restore power following an outage, according to data published by the U.S. Department of Energy's Energy Information Administration (EIA). A report, also completed by 5 Lakes Energy and recently published by the Citizens Utility Board of Michigan, examines this data in more detail.<sup>8</sup>

In short, the widely accepted industry measurement of outage restoration time used by the EIA is the Customer Average Interruption Duration Index (CAIDI). In the EIA's data from calendar year 2017 (the most recent year available), Michigan utilities ranked 4th among the 50 states and DC in terms of CAIDI. But Michigan ranked 2nd in terms of CAIDI excluding "Major Event Days." The Institute of Electrical and Electronics Engineers defines "Major Event Days" as days where significant events, often weather events like ice storms or high

wind, cause an unusually large number of outages. Excluding Major Event Days reduces the risk of data being skewed by these unpredictable and highly variable causes of outage, and thus CAIDI or other indices without Major Event Days is useful when comparing utilities across different parts of the country.

This study, however, will focus on the metrics including Major Event Days. The MPSC regulates utilities given the realities faced by residents of this state. While looking at other regions with different weather gives context that helps evaluate relative utility performance, Michigan utilities ultimately should be required to improve their performance on metrics that fully account for their state's actual, on-the-ground environment.

Compared to its neighboring states alone (Illinois, Indiana, Minnesota, Ohio and Wisconsin) Michigan ranked worst of them all in CAIDI in 2013, 2014 and 2017 (excluding

Major Event Days, it was worst in 2013 to 2017, but Indiana and Minnesota were worse in 2015 and Minnesota alone worse in 2016.)

Two other important reliability indices are the System Average Interruption Frequency Index (SAIFI) and the System Average Interruption Duration Index (SAIDI). SAIFI is the average number of outages per customer per year and SAIDI is the average minutes of outage per customer per year. The relationship between the three indices can be expressed as SAIDI is equal to CAIDI multiplied by SAIFI.

On SAIFI, Michigan ranks fairly average: 22nd-worst in 2017. Compared to the five neighboring states, it ranked 1st-worst in 2017, 3rd -worst in 2016, 1st -worst in 2015 and 2014 and 2nd -worst in 2013.

On SAIDI, Michigan was 6th-worst in the nation in 2017, and worse than its neighbors from 2013 on.

<sup>8</sup>Citizens Utility Board of Michigan. Electric Utility Performance: Ranking Michigan Amongst the States, 2019 Edition. July 9, 2019. [https://d3n8a8pro7vhmx.cloudfront.net/cubofmichigan/pages/15/attachments/original/1563405525/CUB\\_of\\_MI\\_Electric\\_Utility\\_Performance\\_Report\\_2019\\_Edition\\_Final\\_for\\_Website.pdf?1563405525](https://d3n8a8pro7vhmx.cloudfront.net/cubofmichigan/pages/15/attachments/original/1563405525/CUB_of_MI_Electric_Utility_Performance_Report_2019_Edition_Final_for_Website.pdf?1563405525)

# RELIABILITY

# OUTAGES AND ECONOMIC COSTS



Fully accounting for the economic damage dealt by outages is difficult. The U.S. Department of Energy's primary estimates of these costs is found in research conducted by the Lawrence Berkeley National Laboratory (LBNL), cited earlier in this paper. But that research only captures the impact of outages up to 24 hours in length.

A number of outages in Michigan, however, last longer than a day. For example, for 2017 DTE reported that 22,424 customers did not have service restored within 120 hours (under catastrophic conditions), and 106,592 customers did not have service restored within 16 hours (under normal conditions).

While outages lasting more than 24 hours still represent a distinct minority of all outages, the costs of an outage compound as power stays out for more than a day. That is to say, while based on LBNL data

an 8-hour outage costs less on a per-hour basis than a 1-hour outage, as outages continue, costs are incurred that increase the cost per hour. When power is out longer, for example, food may spoil and need to be replaced or cause more money to be spent on eating out. Residents may decide to move to a hotel for a night or more.

Pinning down these costs has proven to be difficult for the research community, but literature supports the notion that outages get more and more expensive the longer they last. "Quantification methodologies for the economic losses from power outages are complicated, and very little work has been done to study long-duration outages (in part because these are rare events)," according to a 2018 report by the Center for Climate and Energy Solutions.<sup>9</sup> "But for outages lasting more than a day there can be spillover effects to the broader economy, making every day of outage more costly than the last."

It is important to note that the costs of outages are especially consequential for low- and moderate-income households. In general, energy tends to make up a bigger fraction of lower-income households' annual expenditures compared to higher-income ones. Since energy is more valuable for lower-income households as a percentage of income, it follows that loss of energy and concomitant costs—food spoiling, loss of work opportunities, etc.—have more severe impacts on lower-income households.

Impact on low and moderate-income customers is particularly relevant for Michigan because these types of customers tend to have a higher energy burden in Michigan than the national average. For example, according to U.S. Department of Energy data from 2015, low- and moderate-income households in renter-occupied buildings in Michigan spend 5% of their income on energy, compared to 4% nationwide.<sup>10</sup>

<sup>9</sup>Center for Climate and Energy Solutions. Resilience Strategies for Power Outages. August 2018. <https://www.c2es.org/site/assets/uploads/2018/08/resilience-strategies-power-outages.pdf>

<sup>10</sup>U.S. Department of Energy. Low-Income Energy Affordability Data Tool. Accessed: July 2019. <https://openei.org/doe-opendata/dataset/celica-data>

# THE COSTS

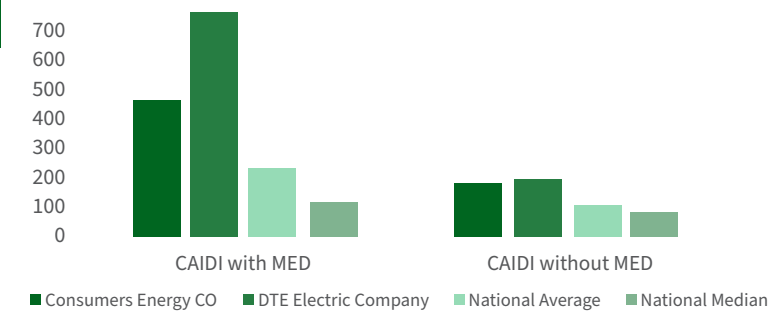




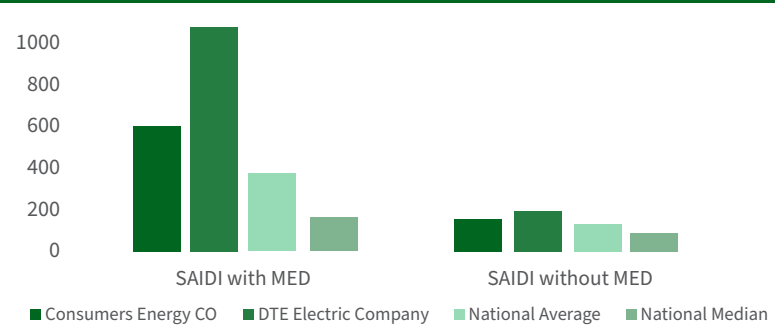
# MICHIGAN UTILITIES AND CURRENT REGULATIONS

Michigan's two major investor-owned utilities are both well above (worse than) the national median and average for all three indices, as shown by the figures below.

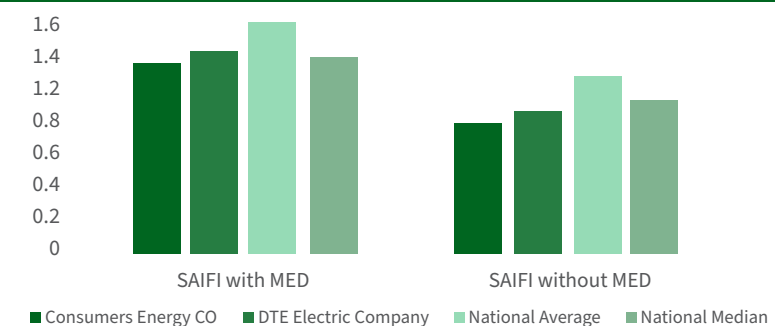
## MICHIGAN UTILITY PERFORMANCE ON RELIABILITY METRICS (CAIDI)



## MICHIGAN UTILITY PERFORMANCE ON RELIABILITY METRICS (SAIDI)



## MICHIGAN UTILITY PERFORMANCE ON RELIABILITY METRICS (SAIFI)





The differences between these indices is important because they show how reliability problems can have different causes and thus, different solutions. As suggested by Michigan’s poorer relative position with CAIDI as opposed to SAIFI or SAIDI, the duration of outages when they do happen is a bigger problem in Michigan than the sheer number of outages.

The MPSC’s Service Quality and Reliability Standards for Electric Distribution Systems, in theory, should push utilities to improve restoration time. Michigan’s current regulatory scheme meant to promote reliability, however, lacks teeth to enforce the standards.

**These standards entitle consumers to bill credits if one or more of the following are violated:**

- Under catastrophic conditions, power is to be restored to all customers within 120 hours after the interruption occurred;
- Under normal conditions, power is to be restored to all customers within 16 hours after the interruption occurred; and
- Customers should not experience more than 7 interruptions due to a same-circuit repetitive interruption in a 12-month period.

The bill credits can be thought of like an insurance payout. The payout never truly makes the insured “whole” again—for example, even if one’s car insurance covers the cost of repairs after the accident, it does not cover the time lost and inconvenience of having to take the vehicle into the shop and losing access to it. While bill credits can never totally compensate for the costs of a prolonged outage, they can give customers some assurance that the pains they endure during an outage will be alleviated to a degree. Therefore, the utility must follow through on bill credits to which customers are entitled. Otherwise, that assurance becomes a hollow hope, giving customers no mitigation against the financial harm and stress that comes with losing power.

However, only a small minority of consumers who are entitled to bill credits actually receive them, according to annual reports filed by Michigan utilities.

For example, Consumers reported that in 2017 only 0.4% of customers who were eligible for credits under one of those standards actually were issued credits. Of 48,109 customers whose power was interrupted under normal conditions and service not restored within 16 hours, 10,523 (22%) called the utility, and 197 (0.4%) were issued credits. The Company was liable for \$1,086,354.50 in bill credits and provided bill credits of \$4,657.83 (0.4%).

DTE’s rate of credit issuance was somewhat higher, reporting that of 106,592 customers in 2017, 7,233 (6.8%) called the utility and were issued credits. Again, these numbers only reflect customers whose power was interrupted under normal conditions and whose service was not restored within 16 hours.



**See the below figures for 2017 numbers on bill credits for different types of outages.<sup>11</sup>**

These low credit issuance rates reflect the fact that Michigan’s rules place a responsibility on the customer to request the bill credit, when most are not aware that bill credits are available. Consequently, without stricter enforcement, bill credits provide little incentive for utilities to reduce the number of outages and cut their duration when they do happen.

**FIG. 4 - CONSUMERS ENERGY (2017)<sup>12</sup>**

Type Of Outage	Customers Affected	Customers Who Received Credits	Credit Issuance Rate	Amount Owed	Amount Paid	Percentage Of Value Paid
<b>Catastrophic</b>	388	108	27.84%	\$8,681.50	\$2,651.34	30.54%
<b>Normal</b>	48,109	197	0.41%	\$1,086,354.50	\$4,657.83	0.43%
<b>Repetitive</b>	23,166	20	0.09%	\$523,181.00	\$476.33	0.09%

**FIG. 5 - DTE ENERGY (2017)<sup>13</sup>**

Type Of Outage	Customers Affected	Customers Who Received Credits	Credit Issuance Rate	Amount Owed	Amount Paid	Percentage Of Value Paid
<b>Catastrophic</b>	22,424	15,716	70.09%	N/A	\$392,900	N/A
<b>Normal</b>	106,592	7,233	6.79%	N/A	\$180,825	N/A
<b>Repetitive</b>	7,711	406	5.27%	N/A	\$10,150	N/A

<sup>11</sup>2018 numbers on the amount of credits issued by utilities are also available. (mLive.com. "1.65 Million in Power Outage Credits Paid to Michigan Utility Customers in 2018." July 26, 2019. <https://www.mlive.com/news/2019/07/165-million-in-power-outage-credits-paid-to-michigan-utility-customers-in-2018.html>.) However, 2017 data is presented because numbers on affected customers came from the utilities’ responses to requests filed by intervening groups before the 2018 data was available.

<sup>12</sup>MPSC Case No. U-20134. Testimony of Douglas Jester on behalf of the Michigan Environmental Council, the Natural Resources Defense Council, Sierra Club, Ecology Center and the Energy Innovation Business Council. September 10, 2018.

<sup>13</sup>MPSC Case No. U-20162. Direct Testimony of Douglas Jester on behalf of Michigan Environmental Council, Natural Resources Defense Council, Sierra Club, Energy Innovation Business Council and Institute for Energy Innovation. November 7, 2018.



# REGULATORY CHANGES TO PROMOTE BETTER PERFORMANCE

**W**ith the rollout of advanced metering infrastructure (AMI), Michigan utilities have a better ability than ever to detect outages. As of June 2018, DTE has installed 2.6 million electric smart meters, or 99.96% of what it planned, with only 9,399 customer meters opting out.<sup>14</sup> As of December 2017, Consumers Energy has completed its smart meter rollout, with 1.83 million installed.<sup>15</sup> According to both utilities, AMI is being used to “ping” meters to determine power conditions, reduce manual reading, and reduce the number of teams sent out to investigate billing errors and other issues, among other benefits.

Smart meters do not lose the ability to notify the utility of an outage even if they primarily depend upon the local grid for power. Smart meters, after loss of grid power, can switch to a battery that provides temporary power. The act of that switch can cause a signal to be sent to the utility, notifying it that an outage has occurred.<sup>16,17</sup> Furthermore, utilities can use software called an outage management system that can interpret outage information from many meters to precisely locate the area affected by an outage.

The MPSC can build upon these technology improvements with the following recommendations:

**The MPSC should require utilities to keep track of outage notifications generated by smart meters in a database for purposes of issuing automatic credits.**

The utility can then use the data on a

regular basis (i.e., monthly) to calculate the number of customers who may be due a bill credit based on outage duration, and automatically issue the corresponding credits to those customers. Customers who have AMI meters should not be required to report their outage or request the credit in order to receive the credit.

**The length of outages should be transparently disclosed to customers.**

Currently, it is difficult for customers to assess when or if they are owed compensation. A notice on customer bills informing them about the number of hours they experienced an outage would likely significantly improve customer awareness and would also ensure that utility reports correspond to actual customer experience.

**The value of bill credits should be tied to the length of the outage in order to more realistically reflect the economic harm done to the affected customers.**

Utilities are only required to issue bill credits for a fixed amount for a qualifying outage. A more realistic formula for calculating bill credits would also include a multiplier that captures this time effect. Such a formula could be as simple as a fixed amount per outage plus a multiple of the number of hours of outage, or could be based on a table that reflects increasing cost per hour with increasing outage duration.

**Bill credits should be provided to customers for all outages, not just for extreme outages.**

Customers experience costs due to outages, whether those outages reflect good or poor utility performance. Bill credits for all outages will provide a form of insurance against the consequences of outages, as described above. Customer outage experience varies over both time and geography, so there can be inequities in that some customers have worse service than others, even if all (within a customer class) pay similar rates. Payment of credits as insurance will mitigate such inequities. As noted above, low-income households often suffer greater harm than other customers and bill credits may be particularly helpful to these low-income households.

**Utilities should be allowed to build into rates only the credits that an average-performing utility would need to provide its customers. This provides a performance incentive for the utility to improve outage frequency and duration.**

The rate recovery process is one of the most powerful tools regulators have to affect utility performance. If the costs of bill credits are all recovered by the utility in rates, the utility is essentially insulated from a portion of the potential financial consequences of worse reliability performance. At the same time, since some level of power outages is inevitable, denying the utility the ability to recover any bill credits for outages would be unfairly punishing the utility for unavoidable events.

<sup>14</sup>MPSC Case No. U-20162. Moccia Testimony. July 6, 2018. <https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t0000023OKMAA2>

<sup>15</sup>Direct Testimony of Michael Torrey, p. 16-17. MPSC Case No. U-20134. May 2018.

<sup>16</sup>Teridian Semiconductor Corp. Application Note. Jan. 2011. <https://pdfserv.maximintegrated.com/en/an/AN4956.pdf>

<sup>17</sup>Dialog Semiconductor. Accessed July 30, 2019. <https://www.dialog-semiconductor.com/smart-meters>

# PERFORMANCE



Industry-accepted metrics of reliability like SAIFI, SAIDI and CAIDI can serve as benchmarks by which to determine what level of reliability is prudent for the purposes of rate recovery. Regulators should view the “prudent” amount of bill credits to recover as those that occur in the context of a reliability performance level that is at or above national average reliability metrics. Accordingly, cost recovery should be denied for bill credits that are generated by an outage level worse than national average reliability metrics.

One way to implement this concept is for the PSC to set a utility’s rates not on the actual amount of bill credits distributed in the rate recovery period alone, but on the actual amount of bill credits that would have been paid if the utility had national average reliability performance. For example, the bill credit rate could be multiplied by the national average index for a metric like SAIDI.

If a utility is allowed to build into its rates the cost of bill credits that it would pay if it performed at the national average, there would be three useful performance incentives. First, if actual outages are worse than the national average, the utility would pay more in credits that is assumed in setting rates and would be penalized through lost profit. Second, if actual outages are better than the national average

the utility would benefit by earning extra profit in the amount of the difference between national average outage costs and actual outage costs. Finally, if the bill credits accurately reflect the cost to customers of outages, then avoiding outages to avoid paying bill credits provides the utility a good measure of what investments in improved outage performance are worthwhile from the customer’s perspective. Additionally, using the national average as the performance standard upon which incentives are based means that if the utility industry as a whole performs better (be that through new technologies or practices) or worse (due to, for example, climate change) the performance standard for Michigan utilities automatically shifts with those industry-wide changes.

**The MPSC should create a regular process for updating the value of the credits so they reflect more recent and accurate estimates of the value of lost load.**

As adopted in 2004, Michigan’s Service Quality and Reliability Standards set the bill credit amount that affected residential customers receive at “the greater of \$25.00 or the customer’s monthly customer charge.”

DTE’s current customer charge for residential customers is \$7.50 per month. LBNL research found that the cost of a

residential customer losing power for 16 hours is \$32.40.<sup>18</sup> But, under normal conditions, Michigan residential customers are not entitled to a bill credit until loss of power is 16 hours at minimum. So even a customer who barely qualifies for a credit, at \$25 is receiving less value than what the outage likely costs him or her. If the outage lasts significantly beyond 16 hours, the costs compound (as discussed above) but the credit stays the same.

LBNL has further refined its methods to estimate the economic costs of outages since that 2015 study. In a 2018 study<sup>19</sup>, LBNL reports the costs of outages using a different method that is based on the weighted average cost of all sustained interruptions,<sup>20</sup> partitioned by time of day and year, in a specific Census region and categorized by customer class.

Using this method, LBNL identifies \$9.4 as the weighted average cost for residential customers in the East North Central region (Michigan, Ohio, Indiana, Illinois and Wisconsin). The customer-weighted average SAIDI in that region is 281 minutes – meaning that the average amount of time that customers are without power is roughly 4.7 hours.

<sup>18</sup>The cost differs based on the time of day and time of year when the outage occurs. The \$32.40 figure is a weighted average of summer and non-summer cost estimates at different times of day.

<sup>19</sup>Lawrence Berkeley National Laboratory. Improving the Estimated Cost of Sustained Power Interruptions to Electricity Customers. LaCommare, Eto, Dunn and Sohn. June 2018. [https://eta-publications.lbl.gov/sites/default/files/copi\\_26sept2018.pdf](https://eta-publications.lbl.gov/sites/default/files/copi_26sept2018.pdf)

<sup>20</sup>LBNL defines “sustained” interruptions as those that last more than five minutes.



Expressing the \$9.4 weighted average cost on an hourly basis, therefore, leads to a cost of about \$2 per hour for residential customers, nearly identical to the \$32.40 for 16 hours calculated by the 2015 study. We mention the 2018 data here in order to include the most recent LBNL estimate.

Under catastrophic conditions, the customer does not receive a bill credit until power has been out for 120 hours or more. Once again, the credit he or she is entitled to is still fixed at \$25 or the monthly customer charge, so the customer who has an outage lasting five days is only credited \$5 per day.

For non-residential customers, the Service Quality and Reliability Standards set the credit amount at “the customer’s minimum bill prorated on a daily basis.” But the minimum bill does not take into account the compounding financial harm that long duration outages have on all customers, including commercial and industrial. The costs incurred by the customer

are not just the cost of the service they do not receive, but also the costs of losing business opportunities, work hours, and other elements that the LBNL research attempts to estimate.

The current credit amounts as set in the administrative statutes are not remotely in line with federally-supported research on the economic cost of power loss. The aforementioned study of the financial impact of long duration outages should be used to create more realistic estimates of what customers are owed after a long duration outage. The rules establishing bill credits for outages should therefore be regularly updated based on the best available evidence of the costs of an outage.

**The MPSC should require utilities to collect data needed to improve estimates of the value of lost load in Michigan, based on the actual duration, timing and scope of outages.**

While LBNL has done good work summarizing the available data on the costs of

outages, they acknowledge that there is very little data on long outages and their analyses do not distinguish the costs a customer experiences with a very local outage where the customer can seek help from nearby family or friends versus a widespread outage in which no assistance is available. LBNL’s analysis also does not include estimates of the costs incurred by local government and other social service agencies to help customers who experience outages.

The MPSC can address the lack of data and analysis of realistic Michigan outages by adopting a standard survey method, requiring utilities to survey affected local governments and a random sample of affected customers, and requiring utilities to submit such data to the Commission which can then make anonymized data available to stakeholders in the regulatory process who can use the data to improve the determination of the value of lost load.



# BILL CREDITS AS PERFORMANCE-BASED REGULATION

**T**hese recommendations show what a more customer-friendly bill credit system could look like, but also provide an opening for the implementation of elements of what is known as Performance-Based Regulation (PBR).

Under normal utility regulation, utilities are allowed to recover their reasonable and prudent costs and a return on their investment. This kind of regulation incents utilities to invest more in order to earn more and does not specifically incent utility performance that is better for customers or society unless that better performance happens to come from greater investment.

A PBR approach can create new levers of accountability for the utilities that would not be possible under traditional cost-of-service regulation. The basic idea is that the MPSC sets performance targets for improvement in a metric. If the utility misses that target by a certain margin, its return on equity is cut by some multiplier of the amount it missed the target. Similarly, if the utility outperforms the target, the utility can be allowed to earn incentive income. The proposed approach to bill credits—where revenue recovery is based

on the national average outage experience—provides exactly this kind of structure.

The Commission could also adopt additional PBR tools with respect to outages, in conjunction with the proposed approach to bill credits for outages. In recent rate cases, Michigan utilities have proposed substantial increases in distribution system investments, partly to improve reliability.<sup>21</sup> The Commission can link return on these investments to outage performance improvements in line with targets established when those investments are approved. Failure to improve as expected could then result in loss of some portion of the rate of return on utility investment.

A precedent for this approach can be found in Illinois. A 2011 law passed by the Illinois legislature authorized utility Commonwealth Edison to spend \$2.6 billion on smart grid infrastructure. To create accountability that the spending would be used to improve reliability, the law included several performance goals, such as a 15% improvement in CAIDI and 20% improvement in SAIFI. For enforcement, the law set that the utility would be

penalized by a 5 to 7 basis point reduction in its return on equity for each year that a goal is unmet.<sup>22</sup>

Other PBR regimes, such as United Kingdom's RIIO (revenue = incentive + innovation + outputs) model, use both rewards and penalties.<sup>23</sup> Utilities get less revenue and/or a lower return on equity when they hit specified targets, but are rewarded with more revenue and/or a higher return on equity when they exceed their targets. Michigan utilities, however, are in a position where they could improve their performance on reliability metrics and still be providing reliability that is well below what utility customers experience in most other parts of the country. As discussed above, Michigan utilities score below the national average and median on most industry measurements of reliability. There is a fairness issue, therefore, in rewarding the utilities (and in effect, penalizing ratepayers) for merely bringing service up to an average level. For that reason, this paper's recommendations focus only on performance-based penalties until utility performance reaches at least the national average.

<sup>21</sup>See Cases U-18255, U-28322, U-20134, U-20561

<sup>22</sup>Synapse Energy Economics, Inc. Utility Performance Incentive Mechanisms: A Handbook for Regulators. Whited, Woolf and Napoleon, March 2015. [http://www.synapse-energy.com/sites/default/files/Utility%20Performance%20Incentive%20Mechanisms%2014-098\\_0.pdf](http://www.synapse-energy.com/sites/default/files/Utility%20Performance%20Incentive%20Mechanisms%2014-098_0.pdf)

<sup>23</sup>Cambridge Economic Policy Associates Ltd. Review of the RIIO Framework and RIIO-1 Performance. March 2018. [https://www.ofgem.gov.uk/system/files/docs/2018/03/cepa\\_review\\_of\\_the\\_riio\\_framework\\_and\\_riio-1\\_performance.pdf](https://www.ofgem.gov.uk/system/files/docs/2018/03/cepa_review_of_the_riio_framework_and_riio-1_performance.pdf)

# ADDRESSING UNINTENDED CONSEQUENCES



**A** PBR approach has its own drawbacks. There are risks that the pursuit of the good of reliability as incentivized by the targets could create unintended consequences that undermine other goods. The Commission could consider some of these approaches if unintended consequences arise in conjunction with the use of bill credits as PBR.

## Overpaying for reliability

Rewarding a utility for improving reliability may cause the company to spend more on distribution infrastructure than the underlying reliability gains are worth. Norway's PBR regime directly addresses this problem and could be an example of how to deal with it.

Norway's model uses a cap on a utility's annual revenue. The revenue the utility receives each year is fixed, so the utility has an extra incentive to focus on cost savings in order to increase profit. Norwegian regulators address this potential problem with the use of performance metrics. If a utility reduces the costs of outages

to customers, regulators grant a higher amount of set revenue the next year (vice versa, if the costs of outages to customers increase, revenue is cut). These costs are calculated using customer willingness to pay for reliability to reflect the declining marginal value of reliability after a certain point (customers are willing to tolerate a level of reliability less than 100% if the costs of achieving that reliability are high enough).

## Customer satisfaction

Capping a utility's annual revenue, as Norway did, also could create a perverse incentive in which the utility generates profit by reducing quality of service to cut costs. Even a more modest PBR regime could lead a utility to shift resources spent on other important service aspects – efficient communication with customers, for example – to reliability improvements. For this reason, performance targets and incentives could address not only reliability but also other elements of utility customer service.

## Crowding out alternatives

Incentives for improving distribution may also lead utilities to focus narrowly on traditional distribution infrastructure at the expense of more innovative and potentially cheaper alternatives. In many cases, distribution constraints may be more cost-effectively addressed through “non-wire alternatives” that utilize energy storage or distributed generation like rooftop solar. While embarking on any PBR pilot, the MPSC should also order staff to study the potential tradeoff between reliability investments and “non-wires alternatives.” CAID/SAIDI calculations could be adjusted to account for the availability of distributed generation, microgrids, and other alternatives. Doing so would reflect the fact that as use of distributed generation grows, the cost of outages diminishes somewhat because more customers have alternatives to the grid.



# CONCLUSION

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The state of Michigan has minimum standards for electric service reliability. But the MPSC has not implemented a mechanism to effectively enforce these standards. Michigan electricity customers experience much worse reliability than do the customers in most of the United States, as well as in the Midwest specifically.

The recommendations in this paper can be a starting point for the MPSC to develop rules and order policies that aim for performance improvements and incentivize the state's utilities to make changes to operations that will increase reliability and, as a result, benefit Michigan residents, industry, and the state's overall business climate.