Session 2
EXPLORING REGULATORY SOLUTIONS

MPSC
Michigan Public Service Commission

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MPSC
Technical Conference
Day 2

Session 2
Exploring Regulatory Solutions

Speaker Topic:
Performance-Based Regulation for Reliability and Resilience

November 5, 2021
10:00 a.m.

5 November 2021

Performance-Based Regulation for Reliability and Resilience

Michigan Public Service Commission (MPSC)

MPSC Technical Conference on Emergency Preparedness, Distribution Reliability, and Storm Response

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About RAP – U.S.

- RAP provides technical and policy support at the federal, state and regional levels, advising utility and air regulators and their staffs, legislators, governors, other officials, and national organizations.

- We help states achieve ambitious energy efficiency and renewable energy targets and we provide tailored analysis and recommendations on topics such as ratemaking, smart grid, decoupling and clean energy resources. RAP publishes papers on emerging regulatory issues and we conduct state-by-state research that tracks policy implementation.

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Overview

- Performance-based regulation background
- First define the goal, then performance criteria, and then how to measure in metrics
  - What do we mean by reliability and resilience?
  - Set the goal and performance criteria (expectation)
  - Metrics measure progress to goal(s)
  - Performance incentives/penalties come later when targets are clear
- PBR for Reliability and Resilience: State examples that represent some leading thinking

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1 Performance-Based Regulation Basics

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All regulation is incentive regulation

- Trick is to understand what incentives are and how they affect behavior
- Traditional cost-of-service regulation often considered the baseline
  - Focused on inputs, sets prices, not revenues
  - Throughput incentive
  - Capital bias

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Performance-Based Regulation (PBR) is…

- A regulatory framework that connects achievement of specified objectives to utility financial performance

- A PBR plan can include a collection of **revenue adjustment mechanisms** and **performance incentive mechanisms (PIMs)**, namely, metrics and formulas that can range from being simply reported, to scored against baseline, to financial rewards or penalties (i.e., adjustments to allowed revenues)

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PBR May Help Overcome Bad Outcomes

- Good things that are not profitable for the utility that don’t get done (Non-wires Solutions, aggregated DERs)
- Bad things that are profitable to the utility that should be prevented (Gold-plating physical assets)
- Bad incentives not easily seen (Deferring expenses like tree trimming, customer care, underserved communities)

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What are the typical tools of PBR?

- Multi-year determination/formula for allowed revenue
- Decoupling
- Earnings sharing mechanisms
- **Metrics and financial incentives linked to outcomes**

Not all of these will be present in every PBR established

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Measuring and incentivizing performance

- Informal regulatory monitoring and oversight
- Data reporting requirements – "metrics"
- Rankings and targets
- Financial performance incentives and penalties

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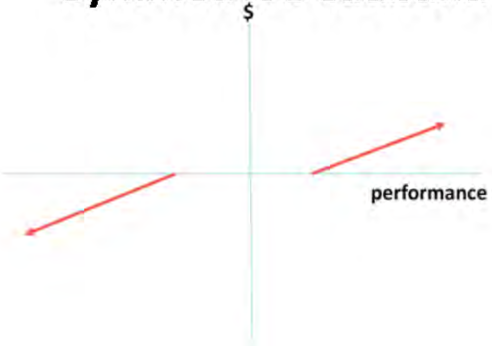
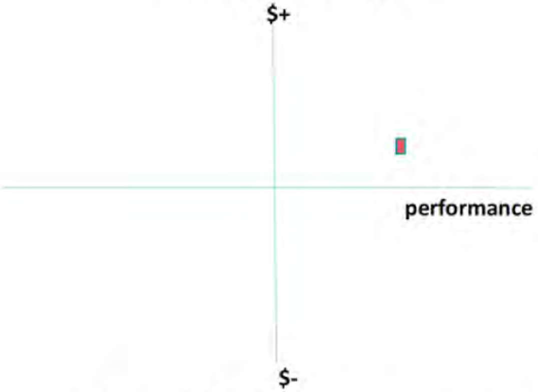
PIMs with Financial Incentives

Symmetric Deadband



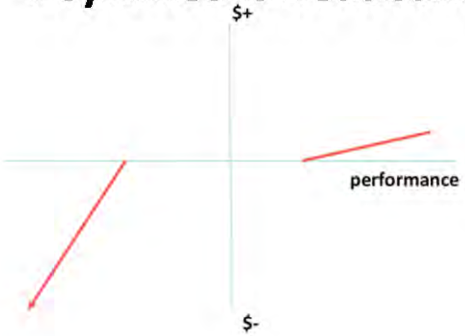
- Based on a compliant result around a deadband at the origin
- Utility wins or loses revenue based on performance
- Dollar for unit
- No limits

Hit the Target



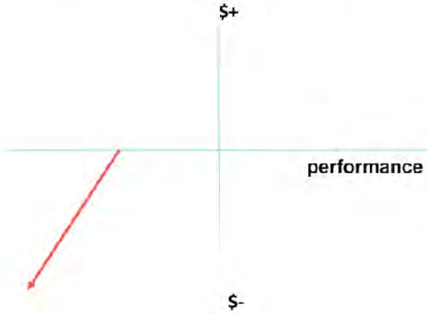
- Upside bonus
- Capped for significant specific superior performance
- No penalty

Asymmetric Deadband



- Upside
- Capped, for superior performance
- Deadband from adequate performance
- Severe penalty for poor performance

One-side penalty (or one-side reward)



- No upside
- Deadband from adequate performance
- Severe penalty for poor

- Consider a combination of designs to provide balance

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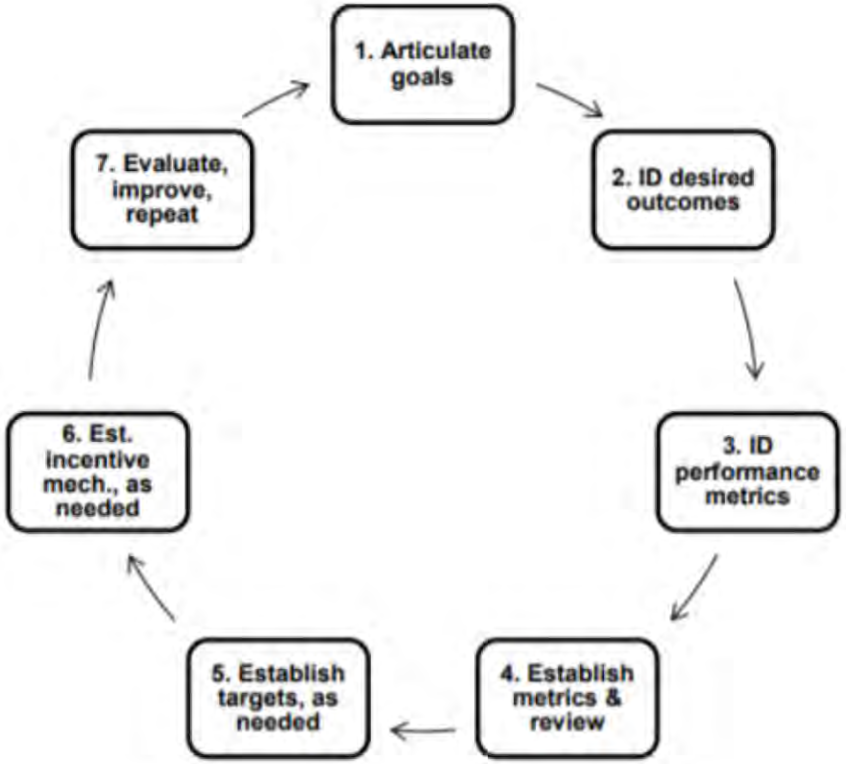
PBR Design Considerations



- Tracks outputs or outcomes, not inputs
- Avoid overlap of reward or penalty for legal or regulatory requirements
- Clear, measurable and meaningful metrics
- Evaluated regularly
- Focus on outcomes within utility control
- Data is accessible

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2 Defining the Outcome

What is Reliability and Resilience?

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Observations

from 10/22/21 workshop

- Storm severity and frequency trends
  - More extreme weather events anticipated
  - Costs to respond to outages, upgrade and maintain the system are increasing
- Aging infrastructure on average (grade of C-)
- Current reporting of reliability metrics – system, customer and worst performing
- Need to differentiate preventable, predictable actions addressed through managed investments vs. reacting

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Reliability

The ability of energy systems & operations to minimize service interruptions during average conditions

- Standard industry metrics
- Benchmark performance to regional/similar area
- Baseline to measure improvement
- System wide and locational focus

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Resilience

The ability of energy systems & operations to minimize service interruptions during extraordinary events and threats

- Robustness against threats and disruptions
- Ability to recover from disruptions
- Ability to continue operations during extraordinary events, threats and disruptions
- Ability to adapt operations and modify the system to continue service

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Reliability and Resilience definitions – Whose perspective?

Customer Resilience

Customer ability to operate and maintain essential functions when grid is down, affordably

- Residential - disadvantaged communities - LI focus
- Commercial / industrial
- Essential services: Hospitals, police, military

Grid Recovery

Ability to recover from major event:

- Black Start
- Storm
- Cyber event
- Failure
- Physical attack

Grid Ability to Withstand Events

Reliability metrics in a major event, e.g., resilience through an event

- Measure without major event exclusions
- Measure "all-in"
- Measure just during major events

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Reliability and Resilience Goals to Performance Criteria to Metrics

Customer Resilience

Customers able to withstand events

- Address disparity in outages
- Weatherized, efficient buildings
- Customer backup capabilities
- Critical facilities backup

System Stability

- Peak load reduction
- Flexible resources
- System awareness
- Black start capability

Outage Reduction

- Standard metrics (SAIDI, SAIFI, CAIDI, etc.) without and with major events
- Locational focus vs system wide
- Forestry / vegetation management costs and % of cycle

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Considerations for System Reliability and Resilience

- Setting reliability goals, criteria and metrics can be difficult
  - How much reliability do customers want to pay for?
- Track and understand costs and performance of system improvements by service level and location on system (capital and vegetation management)
- Are there other complementary goals to address?
  - Equity
  - Distributed energy resources

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3 Performance-Based Regulation for Reliability and Resilience:

Hawaii
Illinois
Minnesota

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Hawaii Performance Metrics

- Reliability – Existing metrics, SAIDI, SAIFI
  - 10 yr. historical performance establishes target and deadband (+- 1 SD)
  - 100% penalty with performance => 2 SD
  - Financial Penalty (20 basis points)
- Resilience Reported Metrics – new as of 2021
  - Critical Load – Total amount of time that critical loads are without power in a year
  - NIMS Certification – Total number of employees completing National Incident Management System Incident Command System certifications
  - Emergency Response Training – Total number of employees that have attended emergency response training, annually
- Shared Savings Mechanisms – cost effective grid investment

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Illinois Performance Metrics for Reliability

- Guiding principle to achieve grid reliability and operational efficiency through formula rates and annual performance metrics over 10 yr.
  - 20% improvement over baseline in SAIFI
  - 15% improvement over baseline in system CAIDI
  - 20% improvement in the CAIFI over a baseline
  - 75% improvement in number of customers who exceed service reliability targets (5 basis point reduction realized for failure to meet this metric)
  - Financial penalties as adjustment to return on equity
- Require annual reliability reports with **worst performing circuits**

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Minnesota Reliability and Resilience Metrics

- System Average Interruption Duration Index (SAIDI)
- System Average Interruption Frequency Index (SAIFI)
- Customer Average Interruption Duration Index (CAIDI)

} **Reliability**

- **Customers Experiencing Long Interruption Duration (CELID)**
- **Customers Experiencing Multiple Interruptions (CEMI)**
- **Average Service Availability Index (ASAI)**

} **Resilience**

- **Equity – Reliability by geography, income, or other relevant benchmarks**
- Momentary Average Interruption Frequency Index (MAIFI)
- Power Quality

} **Power Quality**

Source: C. Linvill, M. Anderson, D. Littell, C. Kadoch, D. Farnsworth, Regulator Assistance Project. *Sharing the Good Stuff: Best Practices From Three Minnesota Initiatives* (June 2021): https://www.raponline.org/knowledge-center/sharing-good-stuff-best-practices-three-minnesota-initiatives/ , citing Minnesota Public Utilities Commission, Docket No. E-002/CI-17-401, Order on September 18, 2019, establishing performance metrics. https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7B0082456D-0000-CA1F9241-23A4FFF7C2FB%7D&documentTitle=20199-155917-01

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4 Key Takeaways

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Potential Areas of Focus

- Setting reliability targets and metrics from current reporting and data
- Address reliability by focusing on poor performing circuits.
  - Track reliability at a granular level with Worst Performing Circuits and require a plan to address performance
- Track and understand costs and benefits of investments and vegetation management.
  - Data informs comparison of average costs of approach to a % of decreased outages in the areas once complete
- Tracking advanced grid functionality investments to benefits and reportable metrics – (e.g. ADMS, AMI)
- Specifying functionalities for new grid investments including timeline and expected performance

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About RAP

The Regulatory Assistance Project (RAP)® is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future.

Learn more about our work at raponline.org

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5 Appendix

Extra Slides

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Resources

- Next-Generation Performance-Based Regulation: Volume 1 (Introduction—Global Lessons for Success)
- Next-Generation Performance-Based Regulation: Volume 2 (Primer—Essential Elements of Design and Implementation)
- Next-Generation Performance-Based Regulation: Volume 3 (Innovative Examples from Around the World)
- Performance Incentives for Cost-Effective Distribution System Investments
- Protecting Customers from Utility Information System and Technology Failures
- Metrics to Measure the Effectiveness of Electric Vehicle Grid Integration
- Sharing the Good Stuff: Best Practices From Three Minnesota Initiatives
- raponline.org

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Traditional regulation: Throughput incentive

- Traditional regulation sets *prices*, not *revenues*
  - Revenue requirement is only an estimate of total cost to provide service; used only as basis for determining rates
- By themselves, consumption-based rates ($/kWh and $/kW) link revenues (and thus net income) to sales
  - More kilowatt-hours sold = more $ utility makes
  - Because in most hours, price of electricity is greater than cost to produce it
    - Utility makes money even when additional usage is wasteful, and loses it even when reduced sales are efficient
- Incentive to increase sales is *extremely powerful*
  - This is the “throughput incentive”

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Traditional regulation: Capital bias

- Traditional regulation determines utility profits based on capital investments in rate base
  - Leads to preference for utility-owned capital solutions over more efficient alternatives, known as the Averch-Johnson effect
- Capital investments are scrutinized by regulators under "used and useful" and "prudence" standards
  - Type of regulatory scrutiny varies greatly
- Asymmetry of info makes regulatory scrutiny difficult, even under best conditions
  - Utilities often know their system and relevant options better than regulators or other stakeholders

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Performance criteria to metrics

- Quantifiable measure of a specified performance
- Typically expressed as standard **power system measures** or **consumer impact measures**
- Examples:
  - Customer minutes with electricity during outage
  - Time to restore x% of customers following outage
  - Critical services without power or alternatively with power during an outage

Photo: Christian Kaindl

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Maryland Reliability and Resilience Metrics for Battery Pilots* *pending @ MD PSC*

- **Customer resiliency**: Utilities will report minutes of energy provided while grid power is unavailable (islanding) by energy storage assets. This quantification could lead to calculating the value to customers of having use of such necessities as lighting and refrigeration during major outage events.
- **Grid resiliency**: To help quantify value of energy storage assets to grid resilience, utilities will report amount of time (hours or days) for restoration of feeders/circuits and entire grid after a major outage event.

Source: MD PSC, PC 44 (Case No. 9619), Submission of the PC44 Energy Storage Working Group, Maillog No. 234481 (March 31, 2021).

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Maryland Reliability and Resilience Metrics for Battery Pilots* *pending @ MD PSC*

- For traditional reliability metrics, the workgroup also recommended that Maryland utilities report on battery pilot metrics:
  - System Average Interruption Duration Index (SAIDI) - no event exclusions
  - System Average Interruption Frequency Index (SAIFI) - no event exclusions
  - Momentary Average Interruption Frequency Index (MAIFI) – no exclusions

All "should be computed on the feeder(s) that are affected by the energy storage installation"

Source: MD PSC, PC 44 (Case No. 9619), Submission of the PC44 Energy Storage Working Group, pages 14-15, Maillog No. 234481 (March 31, 2021).

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DOE Grid Modernization Lab Consortium metrics: Resilience

GMLC Resilience Metrics	Data Requirements
Cumulative customer-hours of outages	customer interruption duration (hours)
Cumulative customer energy demand not served	total kVA of load interrupted
Avg (or %) customers experiencing an outage during a specified time period	total kVA of load served
Cumulative critical customer-hours of outages	critical customer interruption duration
Critical customer energy demand not served	total kVA of load interrupted for critical customers
Avg (or %) of critical loads that experience an outage	total kVA of load severed to critical customers
Time to recovery	
Cost of recovery	
Loss of utility revenue	outage cost for utility ($)
Cost of grid damages (e.g., repair or replace lines, transformers)	total cost of equipment repair
Avoided outage cost	total kVA of interrupted load avoided
	$ / kVA
Critical services without power	number of critical services without power
	total number of critical services
Critical services without power after backup fails	total number of critical services with backup power
	duration of backup power for critical services
Loss of assets and perishables	
Business interruption costs	avg business losses per day (other than utility)
Impact on GMP or GRP	
Key production facilities w/o power	total number of key production facilities w/o power
Key military facilities w/o power	total number of military facilities w/o power (same comment as above)

BERKELEY LAB — ENERGY TECHNOLOGIES AREA

Source: Petit, F., V. Vargas, J. Kavicky. Grid Modernization: Metrics Analysis (GMLC 1.1) – Resilience. April 2020
https://gmlc.doe.gov/sites/default/files/resources/GMLC1.1_Vol3_Resilience.pdf

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North Carolina DEQ Stakeholder Group

Outcome: Resilience
Preferred metrics: • Number of critical assets (see note below) without power for more than N hours in a given region (# of assets), N may be set as 0 hours or greater than the number of hours backup fuel is available • Critical asset energy demand not served (cumulative kW) • Critical asset time to recovery (average hrs)
Alternative metric: • Cumulative critical customer hours of outages (hrs)
Notes: • Recommended metrics revolve around impacts on critical community assets since that is the framework used in the PARSG (Planning an Affordable, Resilient and Sustainable Grid) project and in the state Resilience Plan. This approach is also being integrated into the NARUC-NASEO comprehensive system action plan that the NC delegation is considering. • Critical assets may include hospitals, fire stations, police stations, evacuation shelters, community food supply distribution centers, production facilities, military sites, etc. • Since resilience study is very much a work in progress in North Carolina, it is recommended that these initially be tracked metrics, with no incentive attached. • Efforts to develop resilience metrics are currently underway across organizations such as the DOE, FERC, EPRI and multiple state public utility commissions. The industry is lacking agreed-upon performance criteria for measuring resilience, as well as a formal industry or government initiative to develop consensus agreement.[27] As such, there are currently no standardized metrics to measure resilience efforts or to quantify the extent or likelihood of damage created by a catastrophic event. Resilience is addressed state-by-state, and oftentimes event-by-event. If different metrics, benchmarks, rewards or incentives are identified and developed for reliability and resilience,[28] there is a need to properly distinguish each, take into account the benefits for each, and differentiate how to separately determine the benefits, rewards and penalties for each.[29] • The metrics identified above are based on community impact driven resilience needs for critical infrastructure. It is based on current North Carolina state and local government led application of energy vulnerability and risk analysis framework that uses the Resilience Analysis Process (RAP) developed by the Sandia National Lab, which includes prioritization of grid-modernization

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How the MPSC Can Effectively Address Reliability and Storm Response?

Douglas Jester, Managing Partner, 5 Lakes Energy

MPSC Technical Conference on Emergency Preparedness, Distribution Reliability, and Storm Response

5 November 2021

Topics I Will Address

Background

Getting the Basics Right

Enabling Community Resilience

Financing Extraordinary Improvements

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MPSC
Technical Conference
Day 2

Session 2
Exploring Regulatory Solutions

Speaker Topic:
How the MPSC Can Effectively Address Reliability and Storm Response?

November 5, 2021
10:25 a.m.

Background

DTE Electric and Consumers Energy have known for more than 25 years that their outage performance is in the 4th quartile of US IOUs

Commission has considered this subject many times (partial history)

-1991 Investigation in U-9916

-1995 Investigation in U-10908

-1999 Staff Report

-2000 Investigation in U-12269

-2001 Adoption of Service Quality Standards

-2002 Required Service Quality Improvement Plans

-2004 Investigation of Vegetation Management Practices in U-13975

-2007 DTE Service Quality Plan Litigated in U-15244

-2007 Staff Investigation of Undergrounding in U-15279

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Commission has considered this subject many times (partial history)

-2008 Investigation in U-15605

-2009 Reliability Reporting Requirements in U-16065 and U-16066

-2010 Investigation in U-16462

-2011 MPSC SG Collaborative but when were AMI OMS implemented?

-2014 Investigation in U-17542

-2017 Investigation in U-18346

-2018 Investigation in U-20169

-2019 Statewide Energy Assessment

-2020 MiPowerGrid Review of Technical and Service Quality Standards

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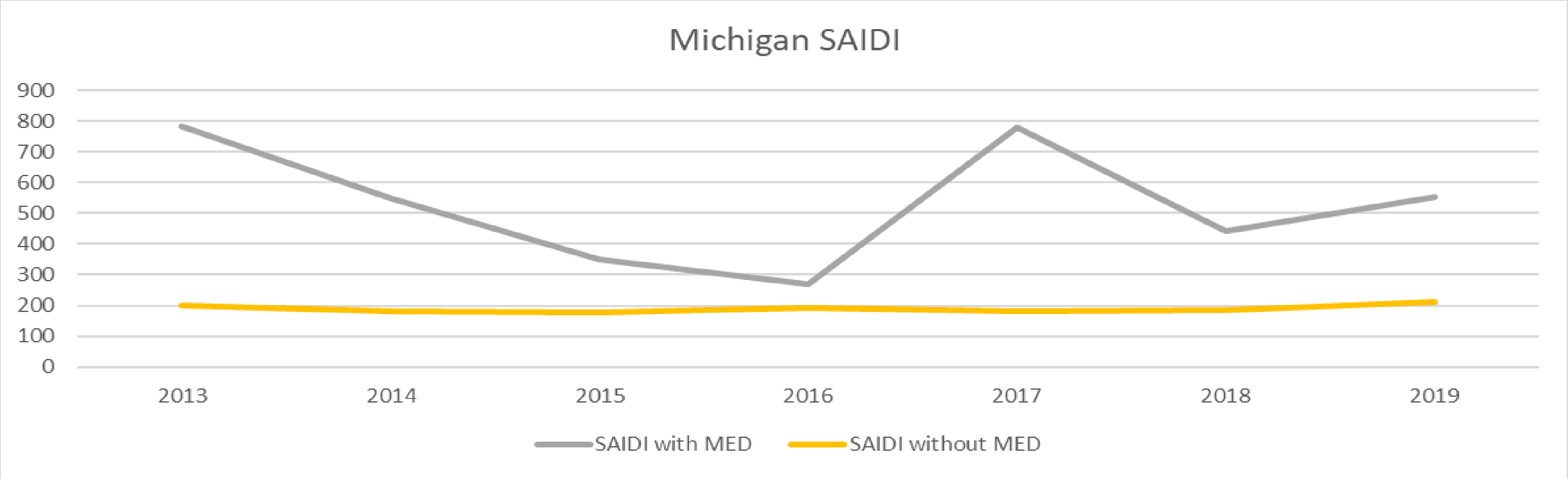
Meanwhile,

Michigan	2013	2014	2015	2016	2017	2018	2019
SAIDI with MED	785	551	350	268	779	443	555
SAIDI without MED	199	179	178	193	179	185	211



Non-public data show that this “trend” extends back into the mid-1990s.

Background

Michigan's poor reliability is driven by long restoration times, while outage frequency is mediocre. This is true both with and without major event days, but especially with major event days.

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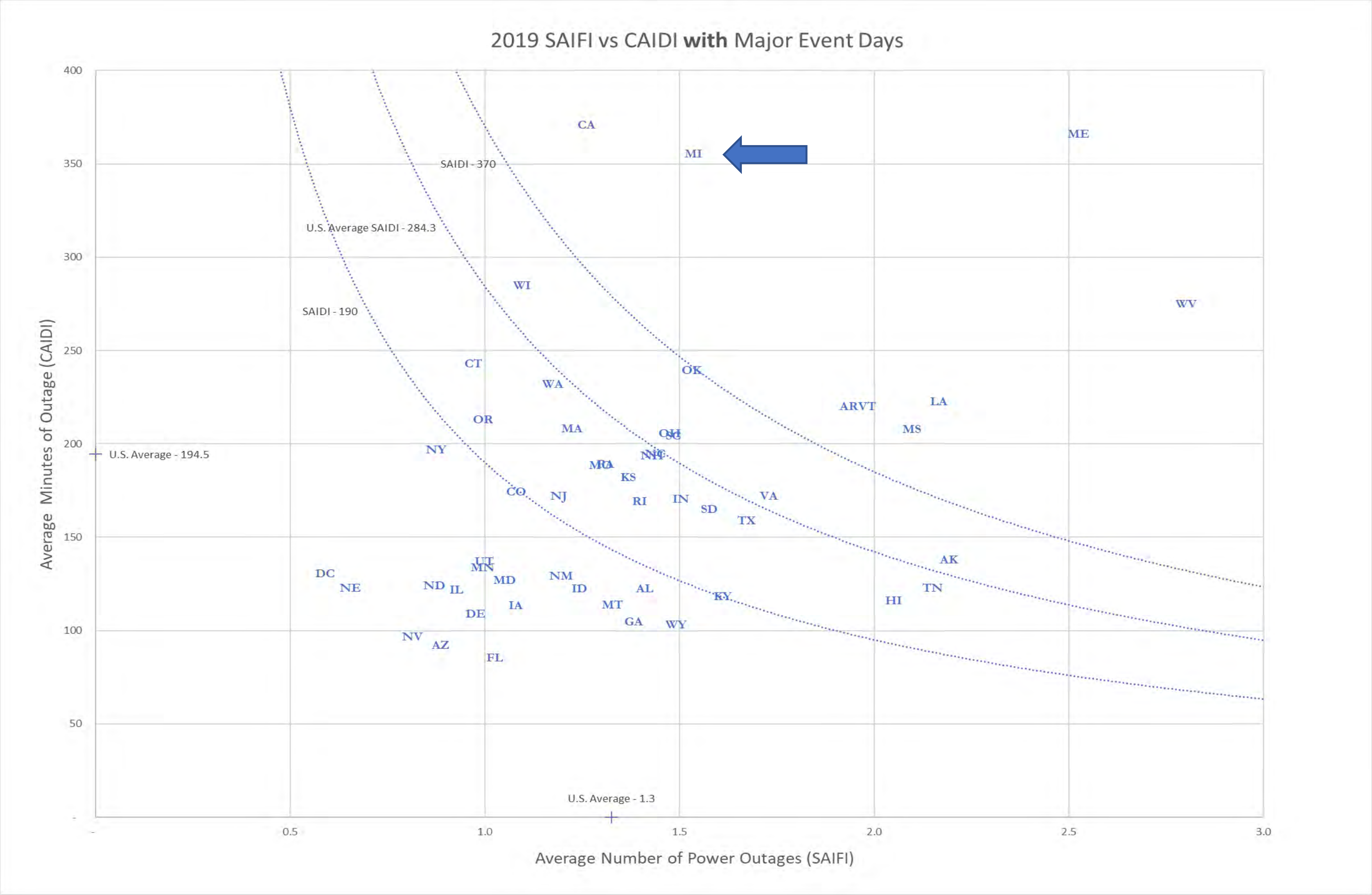

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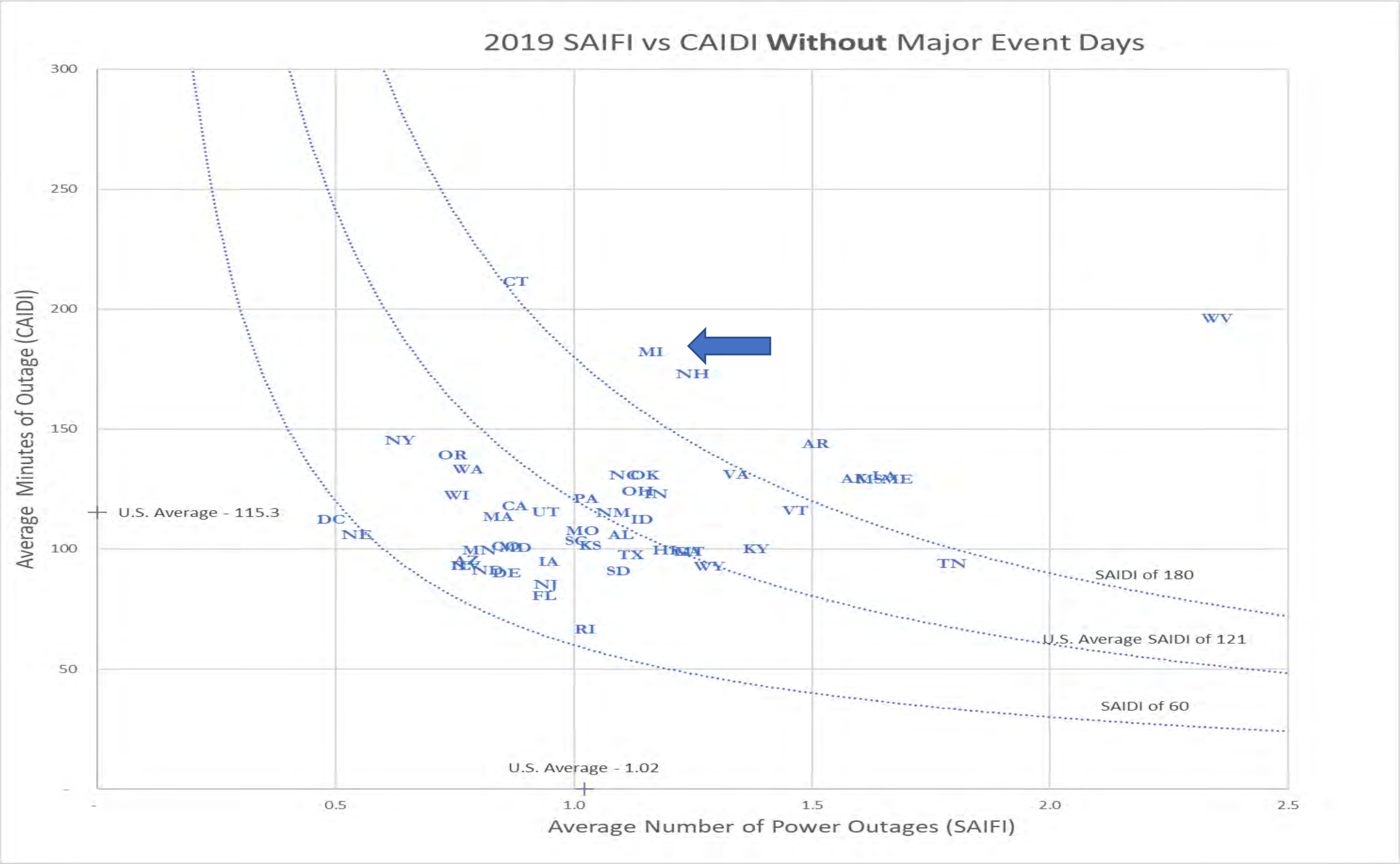

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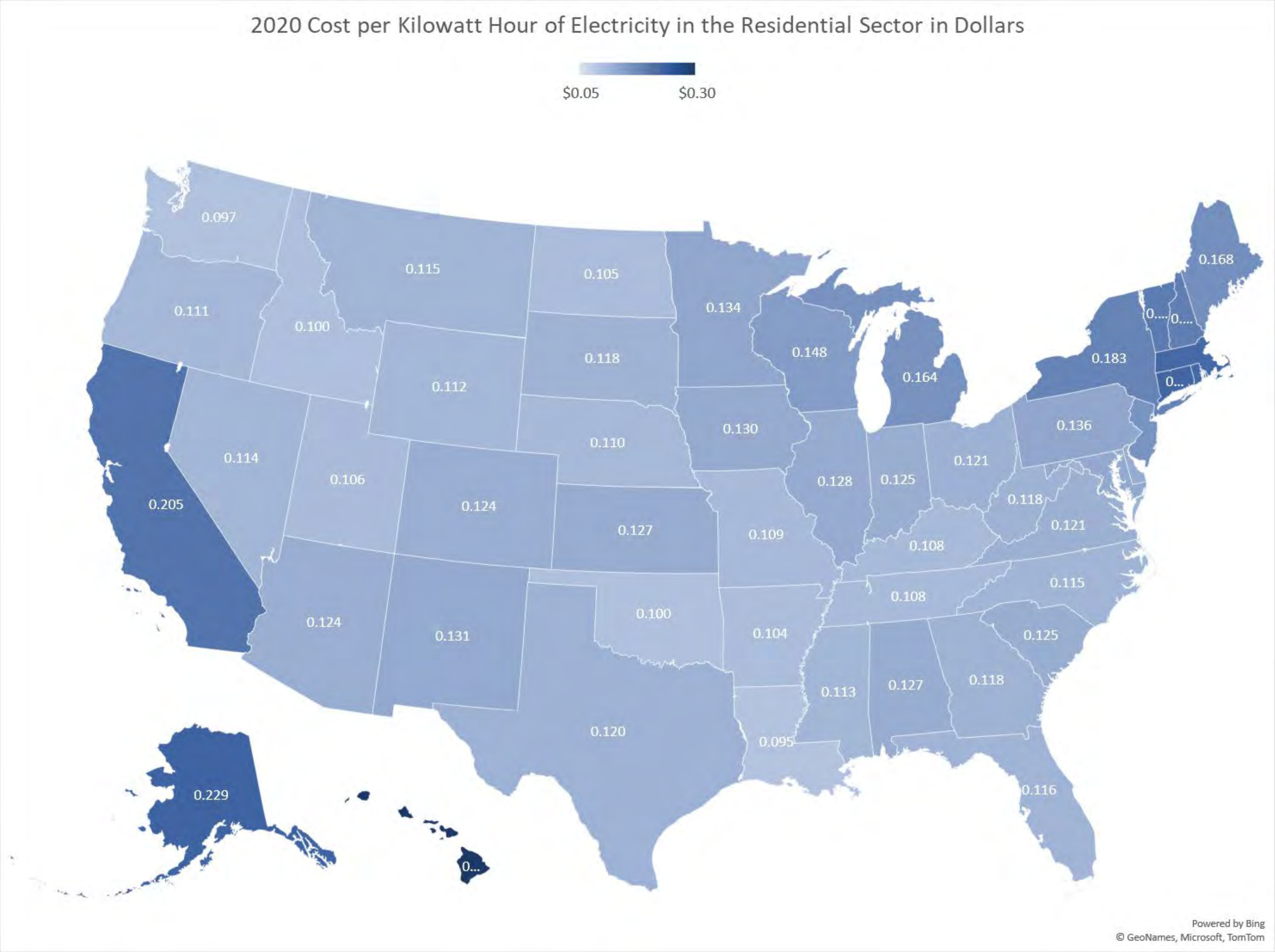

Michigan residential cost per kWh is highest in our region and 11th highest amongst US states.

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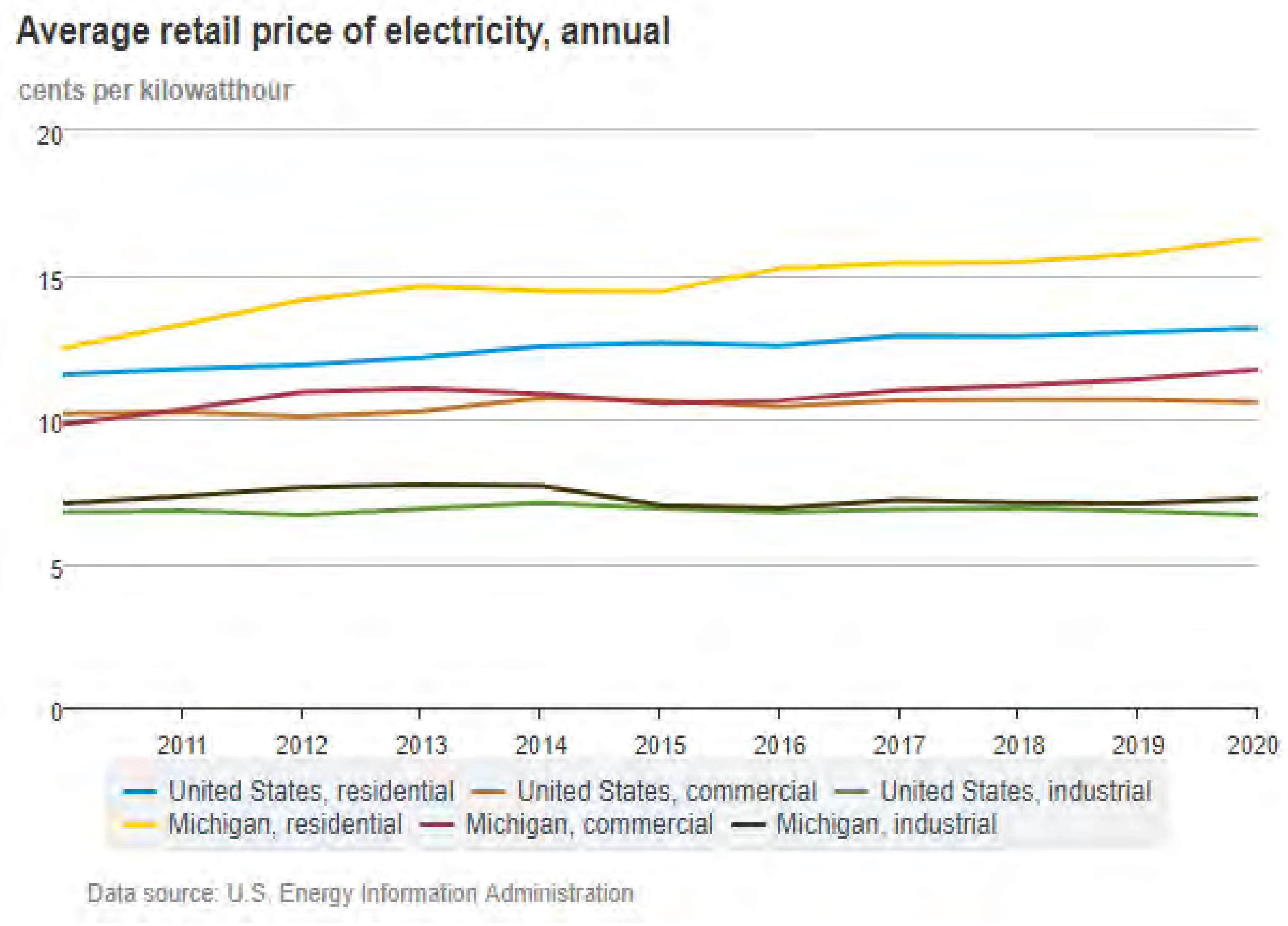

Michigan residential cost per kWh has gone up rapidly compared to US average while Michigan industrial cost per kWh has stayed flat near the national average. **This is mostly due to increasing distribution system costs.**

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Getting the Basics Right

Over a 25-year period, MPSC investigations, staff reports, and utility plans and promises have been ineffectual at improving distribution reliability, but distribution rates are increasing faster than nationally. If "insanity is doing the same thing over and over and expecting a different result", continuing to do this would be regulatory insanity.

How do we achieve cost-effective improvements in reliability and storm response?

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Getting the Basics Right

It is time to courageously use economic regulation:

Customer Value of Lost Power

Outage Bill Credits

Return on Equity

Management Incentives

Management Review and Compensation Disallowance

Cost Trackers

Disallowances

Investment Recovery Mechanisms

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Getting the Basics Right: Customer Value of Lost Power

Accurate estimates of the customer value of lost power are a necessary basis for good economic regulation of reliability

To reflect customer experience, the value of lost power must

-reflect escalating outage costs with outage duration

-be adjusted to season or weather conditions

-be tailored to the customer type, which could include distinguishing low-income from higher-income residential customers.

Current evidence on the customer value of lost power is

-weak for outages over 8 hours duration and essentially non-existent for outages over 16 hours duration,

-does not distinguish large-area vs small-area outages,

–does not distinguish low-income from other residential customers.

MPSC should seek technical assistance from LBNL, adopt rules that require Michigan utilities to collect relevant data after each outage, periodically hold a contested case to determine the customer value of lost power, and consistently apply the determined values in all relevant matters.

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Getting the Basics Right: Outage Bill Credits

Bill credits set at the customer value of lost power and **not recoverable in proportion to credits paid** are a nearly ideal performance-based regulation.

To be effective for any purpose, bill credits must be automatically paid.

Bill credits set at average customer value of lost power, **even if fully recoverable from within the customer class**

serve as insurance, with customers paying the cost of bill credits through rates and receiving credits when they experience an outage;

improve equity, with all customers in the class paying the cost of bill credits but those who experience disproportionate outages receiving the bill credits;

are not a net increase in rates for a customer class, since revenue net of bill credits is unchanged, but are a change in rate design.

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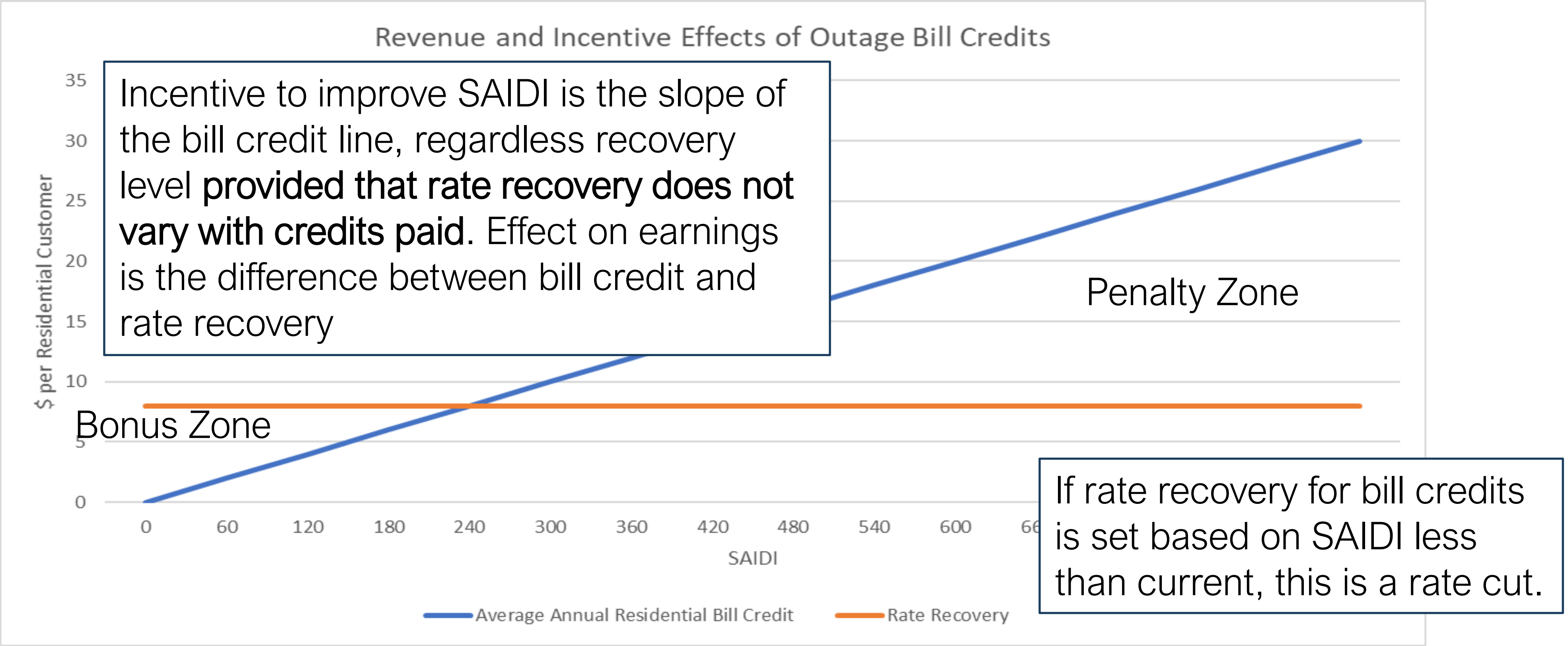
Getting the Basics Right: Outage Bill Credits

The MPSC can set Bill Credits at customer value of lost power and independently determine current effect on RoE by setting an allowance for rate recovery of bill credits.



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Getting the Basics Right: Outage Bill Credits

Bill credits at the customer value of lost power and **not recoverable in proportion to credits paid** are a nearly ideal performance-based regulation.

Utility expenditures that cost-effectively reduce outage credits will be those with revenue requirements that are less than the avoided outage credits, providing a built-in cost-effectiveness test.

Cost-effective reliability measures will increase utility net revenue by the difference between measure cost and avoided bill credits, providing an incentive comparable to regulatory lag incentive for cost reductions.

Cost-effective investments or changes in expenditure will automatically gain cost-recovery through reduced bill credits without requiring a rate case to adjust rates.

Cost-recovery through avoided bill credits automatically assigns measure cost to the benefitting rate classes, providing an equitable cost-of-service allocation.

To reduce bill credits by more than a measure’s required revenue, the measures must be in the geographical places where outages are recurrent, incenting smart geographic targeting.

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Getting the Basics Right: Return on Equity

Return on Equity is the ultimate utility incentive. A reduction in RoE that is directly attributed to distribution system reliability and storm response by the MPSC will command utility attention.

A reduction in RoE that is directly attributed to distribution system reliability and storm response but **can in future be earned back by improved performance** will drive utility performance.

Continuing to authorize RoE in the usual way but making all or a portion of outage bill credits non-recoverable will gain focused utility attention. As an example calculation, applying CUB's proposal of $2 per outage hour residential bill credit to Consumers Energy in 2019 would have reduced residential customer RoE by about 0.368% as compared to an authorized RoE of 10.000%. A policy-based RoE reduction of this kind will not reduce earnings for future investors, which will be determined by market price of equity, but will reduce the value of equity for current equity holders by about 3.7%. This is appropriate, as these conditions arose "on their watch".

A policy change that will take effect in the future allows the utility time to make a choice between getting the basics right or suffering lost equity.

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Getting the Basics Right: Management Incentives

In each rate case, the MPSC considers executive management and employee incentive compensation plans.

MPSC can get a utility's "attention" to reliability and storm response by requiring those incentive compensation plans to more heavily weight SAIDI and by requiring that the compensation tied to SAIDI is more strongly tied either to utility performance compared to an external standard such as national or regional averages or more substantial performance improvement than is the case with current utility incentive compensation plans.

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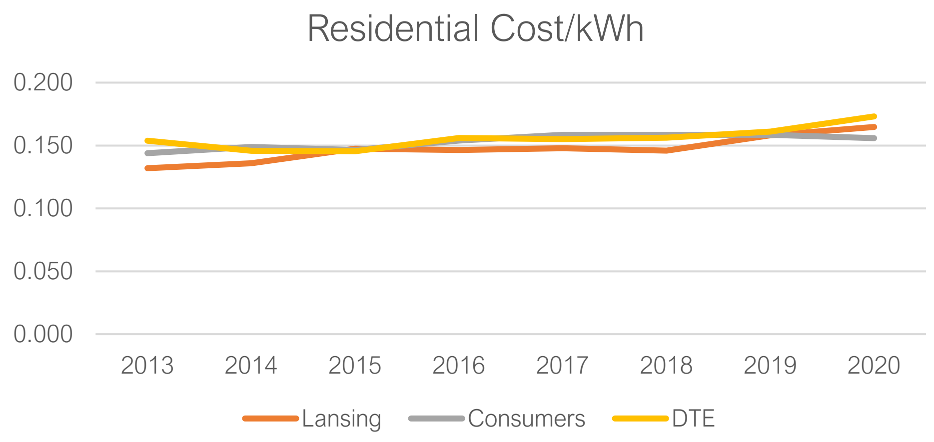
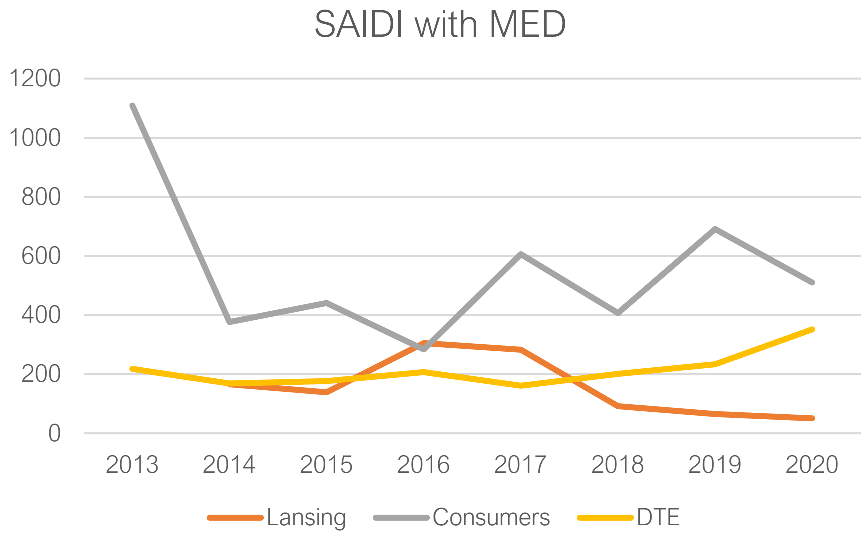
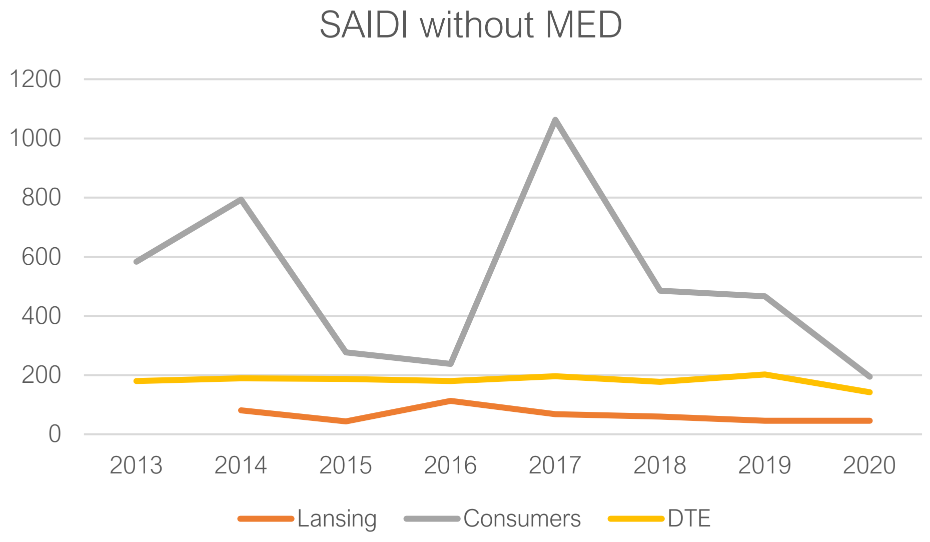
Getting the Basics Right: Management Review and Compensation Disallowance

After a December 2013 ice storm caused widespread long-duration power outages, MPSC investigated DTE and Consumers. Lansing had a citizens review committee (I was a member) and subsequently the Board of Water and Light replaced the General Manager. Vigorous tree-trimming began in 2015.







Getting the Basics Right: Cost Trackers

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Michigan now bases rates on projected test years. This creates an economic incentive to project expenses generously and spend less than projected, adding to earnings. It also creates an incentive to delay expenses that would drive costs above the "budget" embedded in rates. Broadly, the short-term incentive to reduce expenses between rate cases helps to reveal real costs and improve cost-effectiveness, but it works against reliability.

-Allowing capitalization of tree-trimming expenses associated with storm recovery or distribution system rebuilds encourages delay of tree-trimming until these conditions arise. All tree-trimming should be expensed.

-One-way trackers that return to customers underspending in tree-trimming, emergency preparedness, and storm recovery will encourage the utility to do these up to "budget".

-Absence of a tracker for distribution system O&M encourages cost-cutting at the expense of inadequate maintenance and staffing for storm response. It also allows reduced O&M due to storm response. Consider a one-way tracker on distribution system O&M that returns underspending to customers.

-In context of bill credits as utility incentives, a two-way tracker for tree-trimming can encourage performance above plan to reduce bill credit expenses.

Getting the Basics Right: Disallowances

Distribution system spending, whether viewed prospectively in a projected test year or retrospectively, is the cumulative result of hundreds or thousands of spending decisions. It is a practical impossibility to carefully review all of these decisions for prudence in a rate case with a fixed and short calendar. In recent cases, MPSC decisions have effectively told intervenors that disallowances must be supported on itemized decisions and not on evidence of programmatic ineffectiveness.

MPSC should accept that examining a program based on careful examination of a few expenditures is evidence of utility management and process effectiveness, which the MPSC can then consider in disallowing either prospective or retrospective costs on an overall program.

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Getting the Basics Right: Investment Recovery Mechanisms

Investment recovery mechanisms can be attractive for both utilities and customers, since they tie investment-based rate increases to actual instead of projected investments, reduce regulatory lag, and perhaps reduce rate case frequency. However, the MPSC rejected IRMs based on distribution system plans in U-20134 and U-20162 because the plans and accountability for results were insufficient.

Current distribution investment plans are problematic because they are referenced by utilities as the basis for prudence in rate cases but are not contested outside rate cases and are subject to limited review within rate cases due to both time pressure and utility positions that much of the plan is outside the scope of the rate case.

MPSC should consider allowing distribution system IRMs if and only if the underlying plan and accountability system are established in a stand-alone contested case.

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Enabling Community Resilience

Even under optimistic assumptions, it will be many years before Michigan reliability is national average. Even national average will not be good enough that reliability displaces a need for community resilience when power is out. MPSC must adopt policies to enable community resilience when power is out.

1. Prohibit interruptible service for facilities that are critical for community resilience, such as telecommunications, water and sewer infrastructure, gas transmission and distribution, etc.. The customer categories should be determined in consultation with State and local emergency preparedness organizations.
2. Prohibit standby charges altogether or at least for critical facilities (broadly construed) who implement microgrids, to eliminate that economic barrier to establishing microgrids that support community resilience.

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Enabling Community Resilience

3. Require utilities to offer microgrids to single customers or to electrically connected groups of customers as a tariffed utility service.

4. Consider socializing the costs of utility microgrids when provided to critical facilities needed to sustain public health and safety during power outages (e.g., designated cooling centers).

5. Require utilities to rely on customer-owned or deploy utility-provided microgrids to sustain critical facilities in an emergency “blackout” or “brownout” situation.

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Financing Extraordinary Improvements

Unless widely deployed or deliberately targeted for social good, costly strategies like undergrounding cannot fairly be financed by all customers. Utilities currently lack a regular mechanism to finance, for example, undergrounding where customers would prefer that to necessary tree-trimming. Utilities currently lack a decision-making mechanism to implement undergrounding at customer expense where affected customers don't unanimously agree. This approach can be taken with practices other than undergrounding, which serves here as an example.

1. MPSC establish utility avoided cost methodology of undergrounding, including avoided bill credits to other customers (or avoided outage costs to other customers) due to accelerated storm recovery.
2. Utility will pay NPV of avoided costs including avoided bill credits toward undergrounding. Host community will pay remaining cost as CIAC.

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Financing Extraordinary Improvements

3. Distribution system plans and tree-trimming schedules must be provided to communities with enough lead time for them to make decision to adopt alternative to planned tree-trimming (~2 years) and communities must be actively consulted by utilities in developing their plans.

4. Host communities may be able to coordinate undergrounding with local infrastructure construction schedules, reducing total cost.

5. Community can pay CIAC from general revenue, grants, or special assessment to customers served by undergrounding. Local governments have existing mechanisms for these decisions.

6. MPSC or State can mitigate discriminatory effect on low-income communities through grants

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Summing Up

1. Michigan's distribution reliability problem is longstanding and should be addressed with the tools of economic regulation.
2. MPSC determination of the costs of outages is needed to support economic regulation.
3. Bill credits, well applied, are an almost ideal form of performance-based regulation for distribution reliability.
4. Overt consideration of reliability in setting return on equity would be a powerful tool to engage utility attention, and non-recoverable bill credits would serve this purpose.
5. MPSC can determine whether management incentive pay or management compensation are recoverable, based on distribution reliability.
6. Cost trackers can realign utility financial incentives toward improving reliability.

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Summing Up

7. Disallowances are powerful regulatory tools. Disallowances based on program effectiveness are practical to improve distribution system spending but limiting disallowances to itemized spending is not.
8. Investment Recovery Mechanisms could be beneficial if and only if the distribution system plans on which they are based can be examined in contested cases outside a full rate case and are accompanied by other reliability accountability measures.
9. Community resilience should be supported by eliminating regulatory obstacles to private microgrids and requiring utility offerings of utility-managed microgrids.
10. Financing extraordinary reliability measures can be facilitated by engaging local governments and their ability to make collective decisions