September 8th, 2021

Welcome

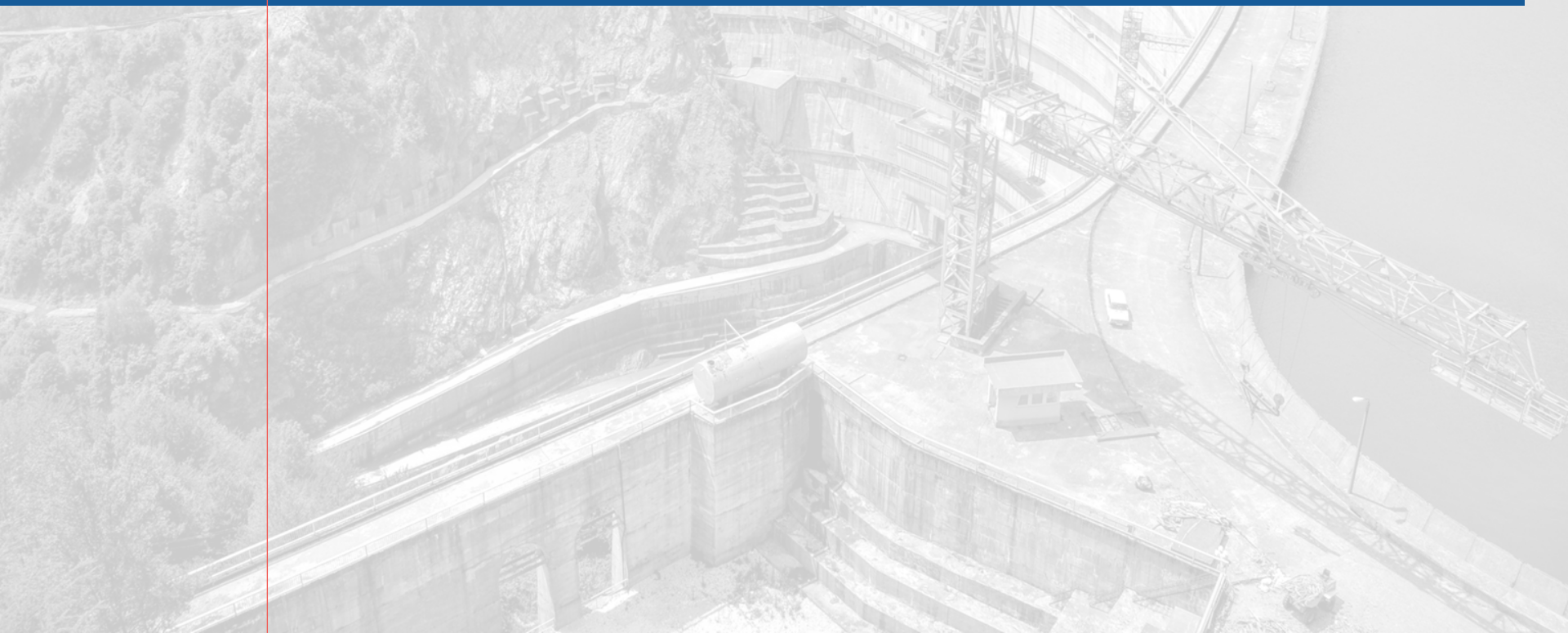
Michigan PSC DER Rate Design Workgroup Meeting

Regulatory Assistance Project®

Carl Linvill
Principal
+1 775 450 0603
clinvill@raponline.org

Mark LeBel
Associate
+802 498 0732
mlebel@raponline.org

PSC Intro



Meeting Objectives

1. Answer questions about draft RAP report
2. Continue sharing a broad range of perspectives on DER rate design
3. Inform subsequent stakeholder written comments on the draft RAP report

Meeting Agenda

1:30	Introductions and overview of the process
1:40	Meeting objectives and agenda
1:45	Overview of Sections 2 and 3 of RAP draft report, followed by questions and discussion
2:15	5 minute break
2:20	Overview of Sections 4 and 5 of RAP draft report, followed by questions and discussion
2:50	10 minute break
3:00	Overview of Section 6 of RAP draft report, followed by questions and discussion
4:15	Next steps and close

Requests for Today

- Practice “democracy of time”
- Challenge assumptions, your own and others’

RAP®

DRAFT FOR PUBLIC COMMENT

Smart Rate Design for Distributed Energy Resources

Regulatory Assistance Project for the Michigan Public Service Commission

By Mark LeBel, Jessica Shipley, Carl Linvill and Camille Kadoch

Section 2: Background and Regulatory Context

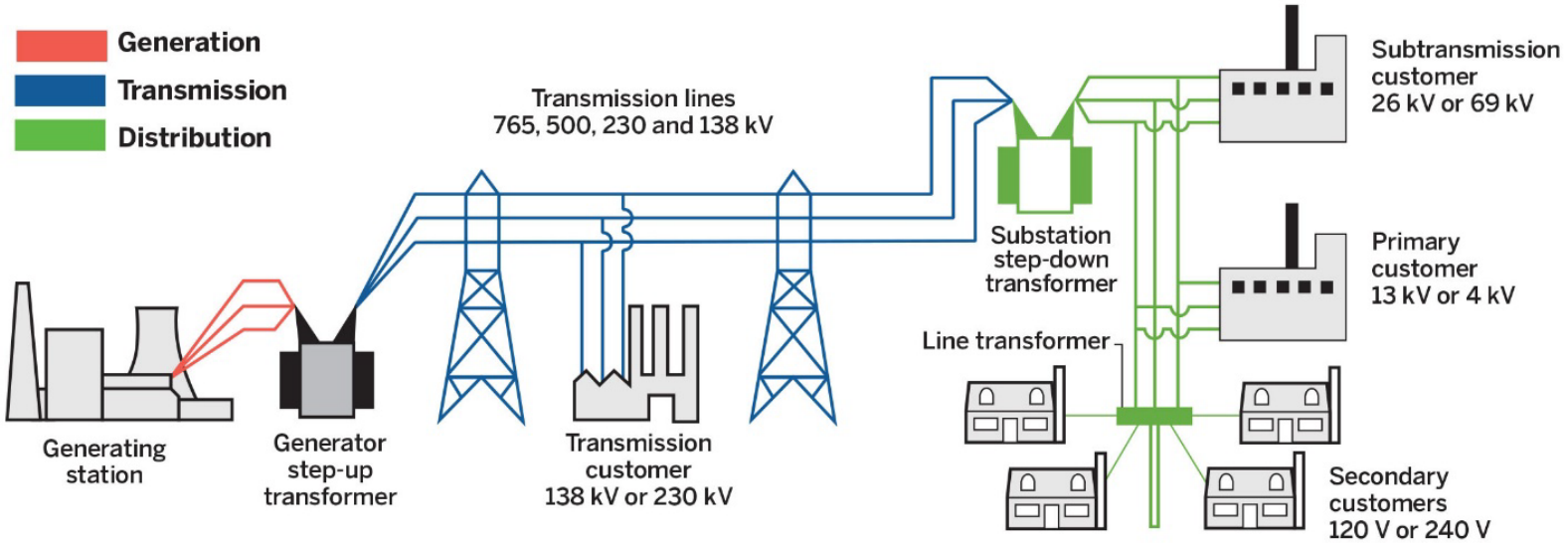
Electricity market structure and utility regulation in Michigan

- MPSC has jurisdiction over seven investor-owned electric utilities, with core authority over:
  - Generation resource adequacy
  - Retail rates
- MISO oversees wholesale generation markets and transmission

DER compensation and rate design in Michigan

- Net metering policies first established by statute in 2008
  - “True” and “modified” net metering
- 2016 statute provided for reforms, which led to inflow/outflow framework
  - Key implementation steps from 2018 to 2020
- Core residential rate design is moving towards TOU rates

“Traditional” electric system

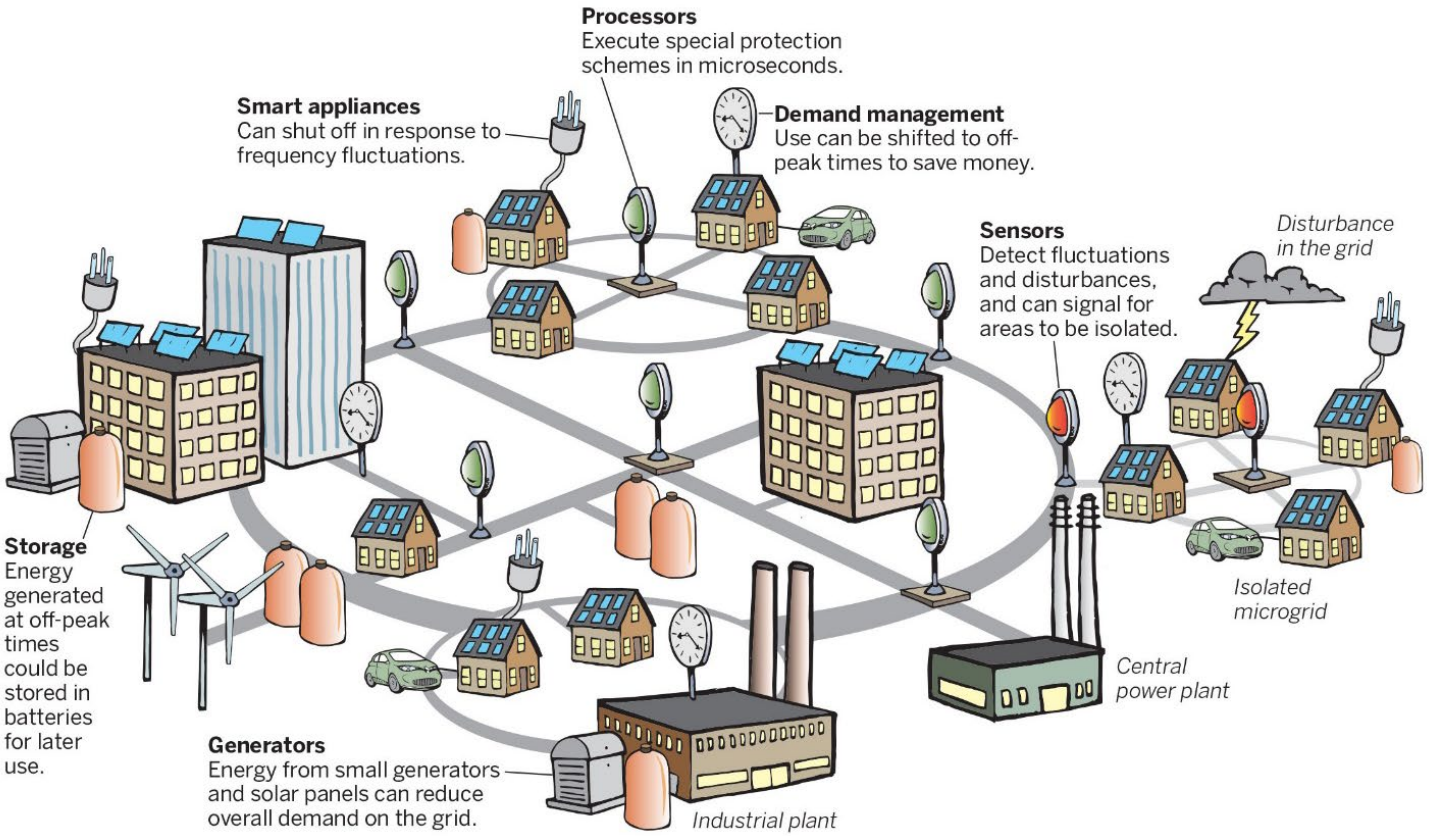


Source: Adapted from U.S.-Canada Power System Outage Task Force. (2004). *Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations*

Traditional assumptions

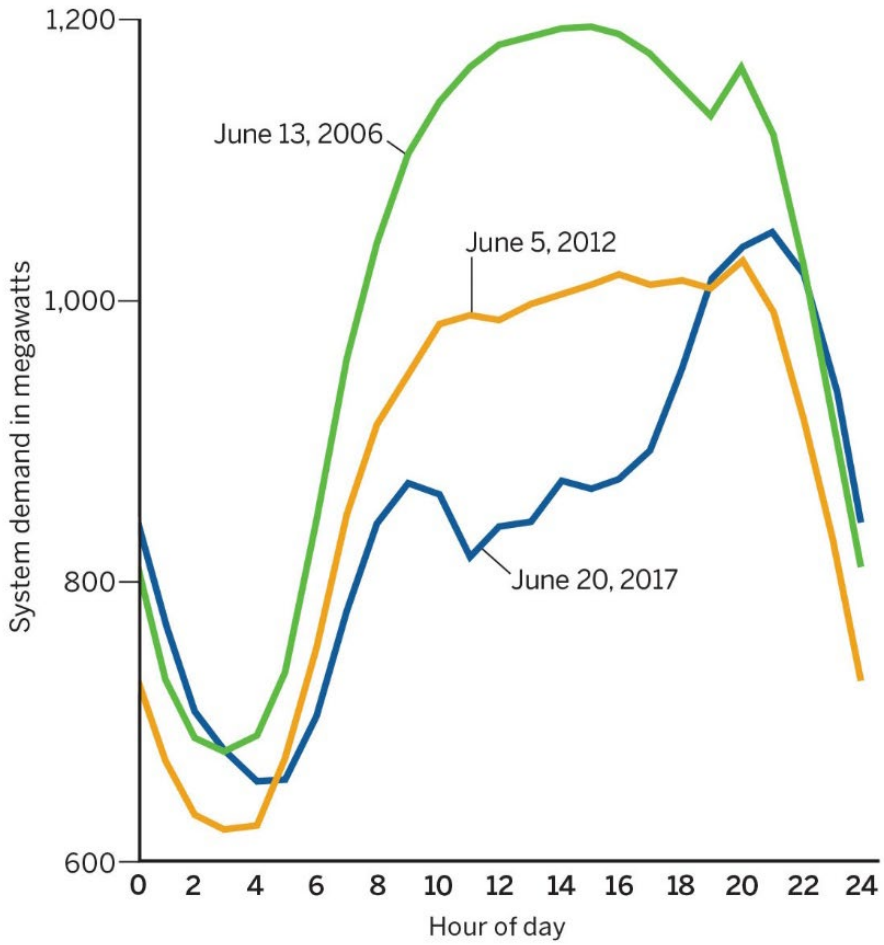
- Reliability risks focused on generation resource adequacy issues at system peak hours
- Little visibility and control on transmission and distribution system
- Metering can only record and store simple data
- Customers cannot manage their usage or export energy back onto the grid

Electric system of the future



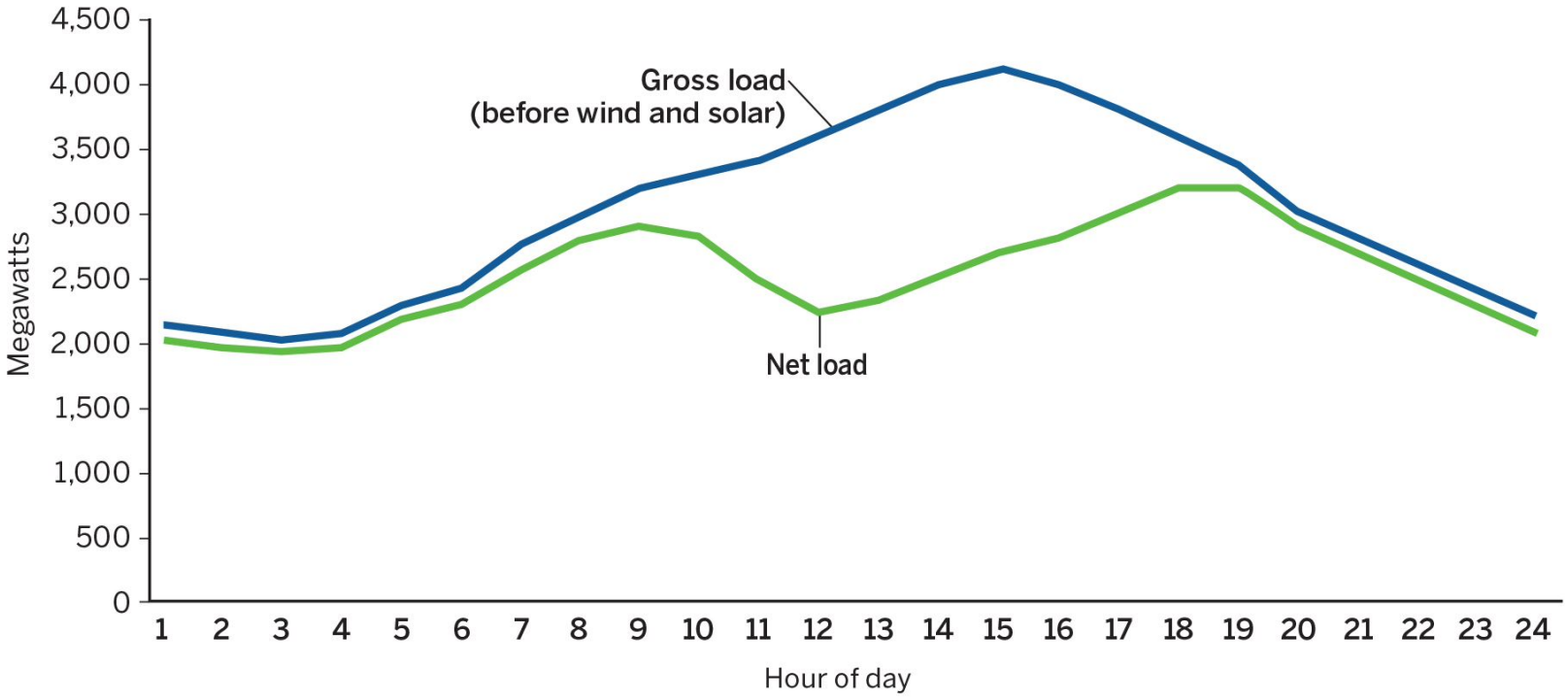
Source: Adapted from U.S. Department of Energy. (2015). *United States Electricity Industry Primer*

Evolution of “duck” curve in Hawaii

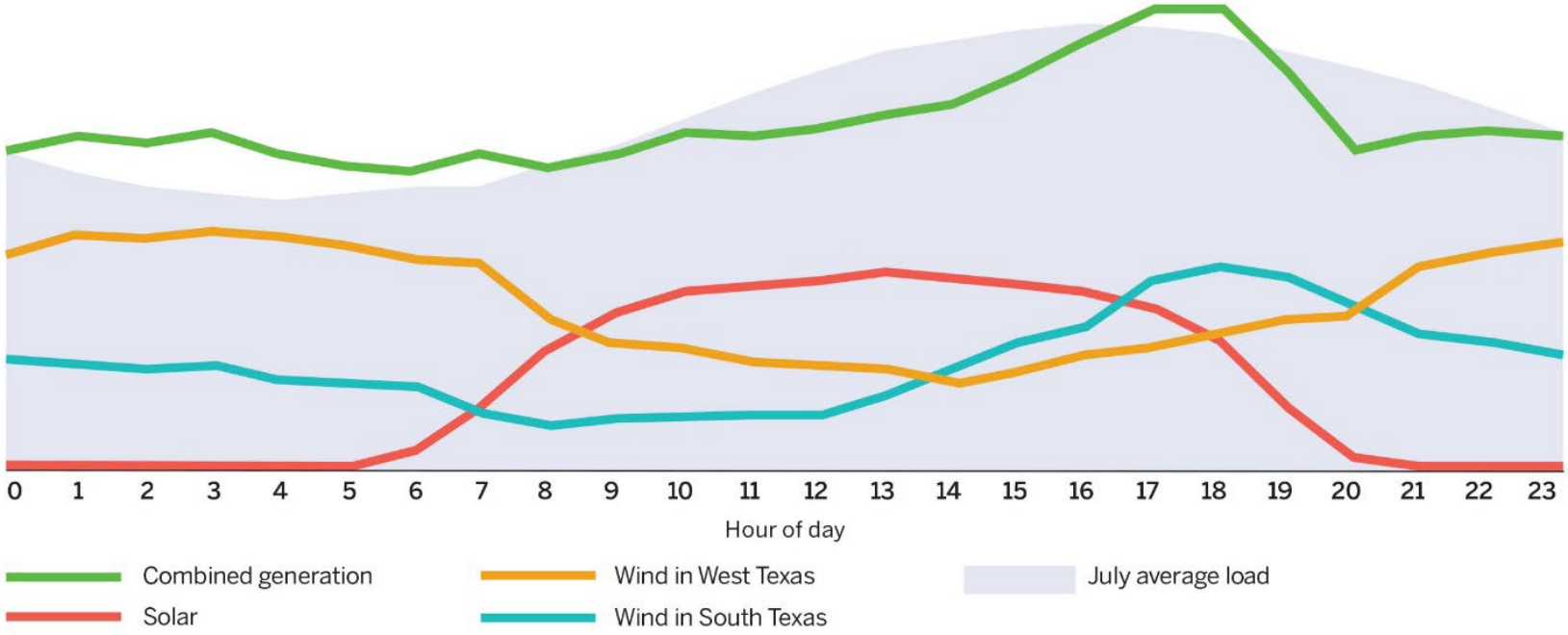


Data source: Federal Energy Regulatory Commission. *Form No. 714 — Annual Balancing Authority Area and Planning Area Report*

Net versus gross load



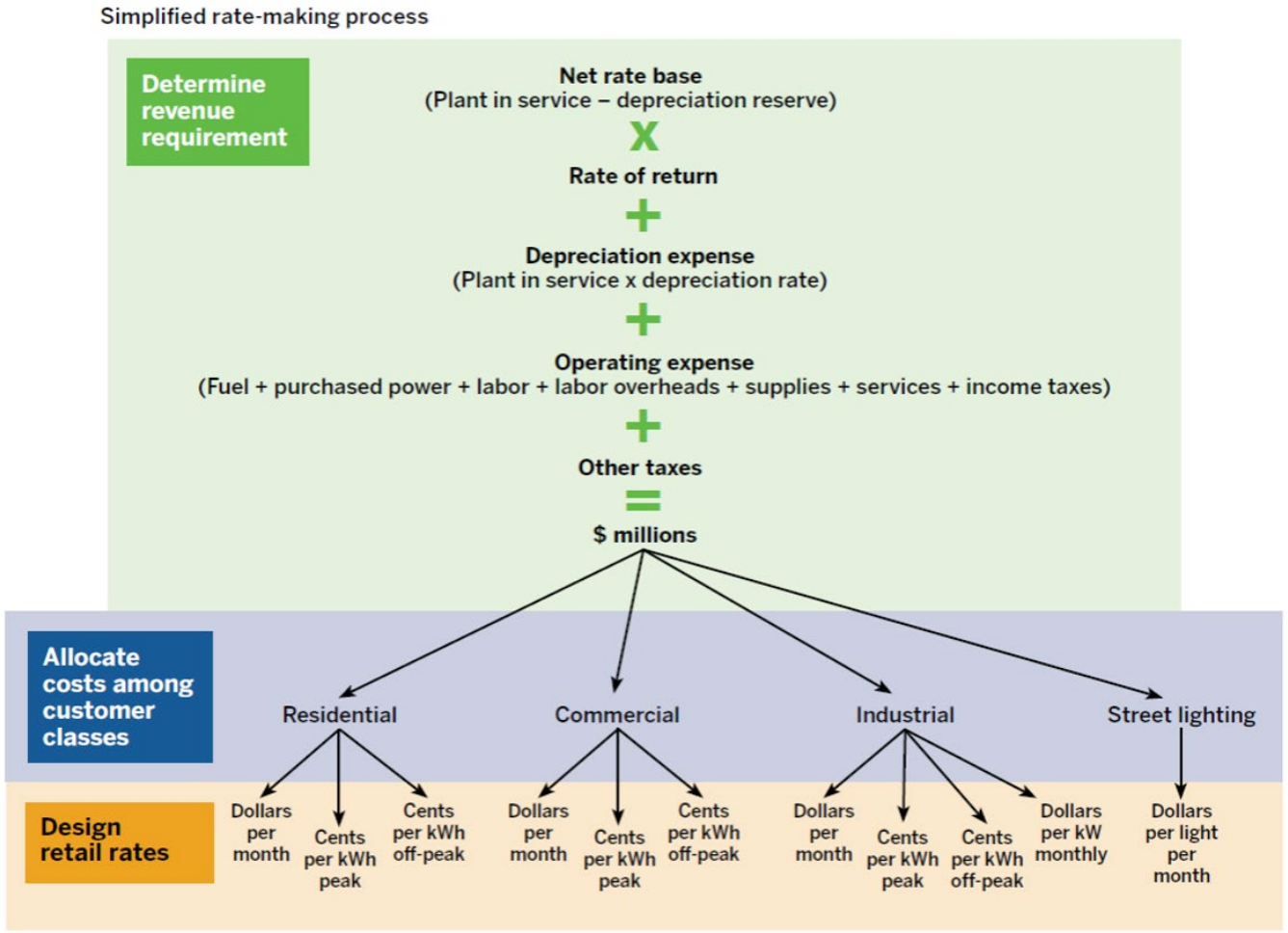
Overall resource mix matters!



Sources: Adapted from Slusarewicz, J., and Cohan, D. (2018). *Assessing Solar and Wind Complementarity in Texas* [Licensed under http://creativecommons.org/licenses/by/4.0]. Load data from Electric Reliability Council of Texas. (2019). *2018 ERCOT Hourly Load Data*

Section 3: Ratemaking Practices and Perspectives on Costs and Benefits

Ratemaking process



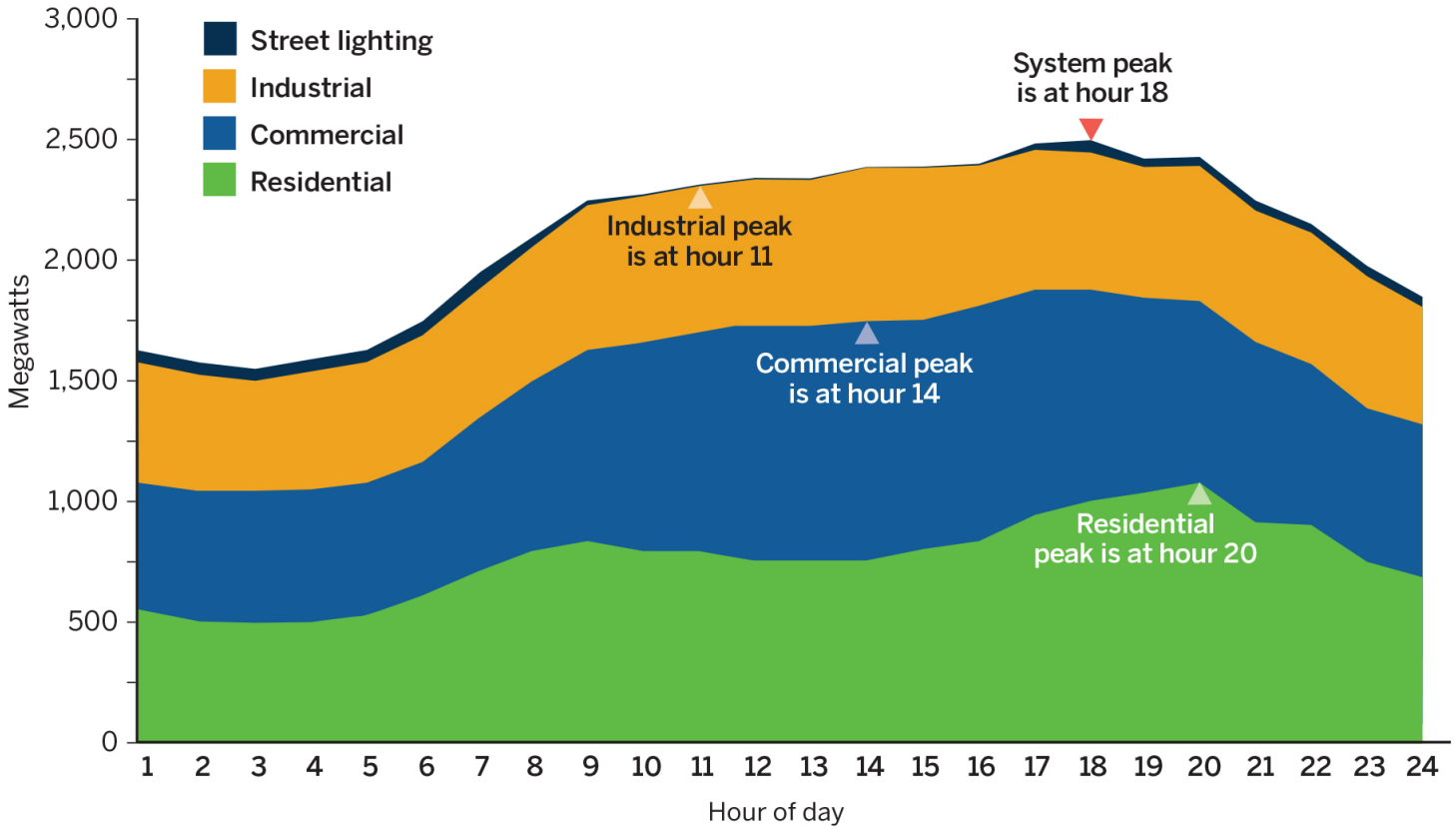
Key ratemaking principles

- Effectiveness in yielding total revenue requirements
- Customer understanding and acceptance
- Equitable allocation of costs and avoidance of undue discrimination
- Efficient price signals that encourage optimal customer behavior

Policy goals of utility regulation

- Competition within electric sector and across markets
- Provision of reliable service
- Societal equity
- Administrative feasibility
- Clean energy and DER-focused employment
- Public health and environmental protection

Illustration of load diversity

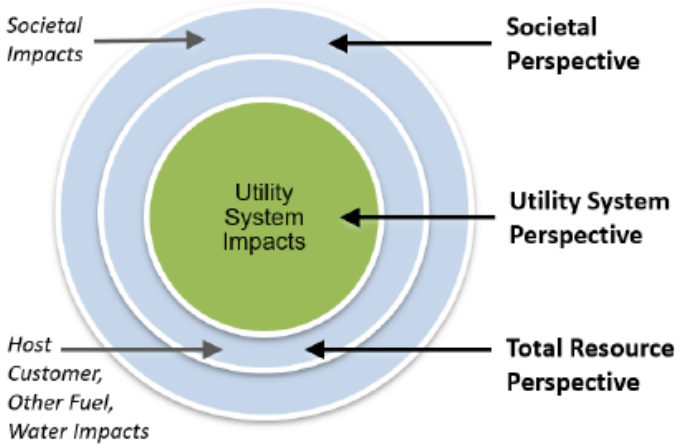


Cost causation

- Shared electric system costs are driven by collective patterns of customer usage
- Lower load diversity at customer end of distribution system
  - E.g., service drops, secondary lines and line transformers
- Billing and customer service costs may vary by type of customer
- Administrative and general costs are driven by size of the business
- Public policy programs reflect a mix of motivations
  - Electric system benefits
  - Broader societal goals

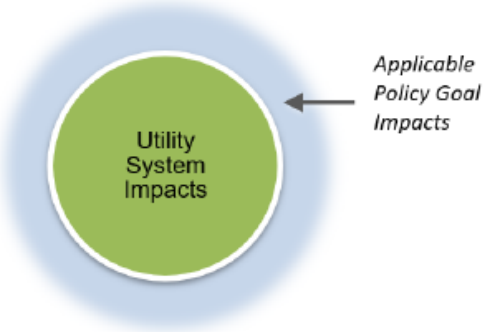
Benefit-cost analyses

Traditional Perspectives



- Three perspectives define the scope of impacts to include in the most common traditional cost-effectiveness tests.

Regulatory Perspective



- Perspective of public utility commissions, legislators, muni/coop boards, public power authorities, and other relevant decision-makers.
- Accounts for utility system plus impacts relevant to a jurisdiction's applicable policy goals (which may or may not include host customer impacts).
- Can align with one of the traditional test perspectives, but not necessarily.

Source: National Efficiency Screening Project. (2020). National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources: Summary, (August 2020), P. V, https://www.nationalenergyscreeningproject.org/wp-content/uploads/2020/08/NSPM-Summary_08-24-2020.pdf

Cost allocation frameworks

- Embedded cost allocation techniques date back to early 20th century in many cases
- Marginal cost allocation techniques developed in 1970s and 1980s
- What is a cost shift?
  - Different potential definitions overlap with choice among different cost-effectiveness tests

Open discussion until 2:15 pm

5-minute break until 2:20 pm

Section 4: Overarching Program Parameters

DER customer netting options

- Monthly netting
- Instantaneous netting (inflow/outflow)
- Time of use netting
- Granular netting options with advanced metering

Other DER customer metering and billing options

- Buy all/credit all
- Stand alone and virtual metering/billing
- Options that require advanced inverter functionality

Other program and tariff design features

- Programs and tariffs may vary by size, capabilities, customer type and control
- Renewable energy credit treatment
- Non-bypassable charges

Changes in tariffs over time and experimentation

- Pre-existing customers
- Process experiments
- Pilot programs and tariffs

Section 5: Designing Rates and Credits

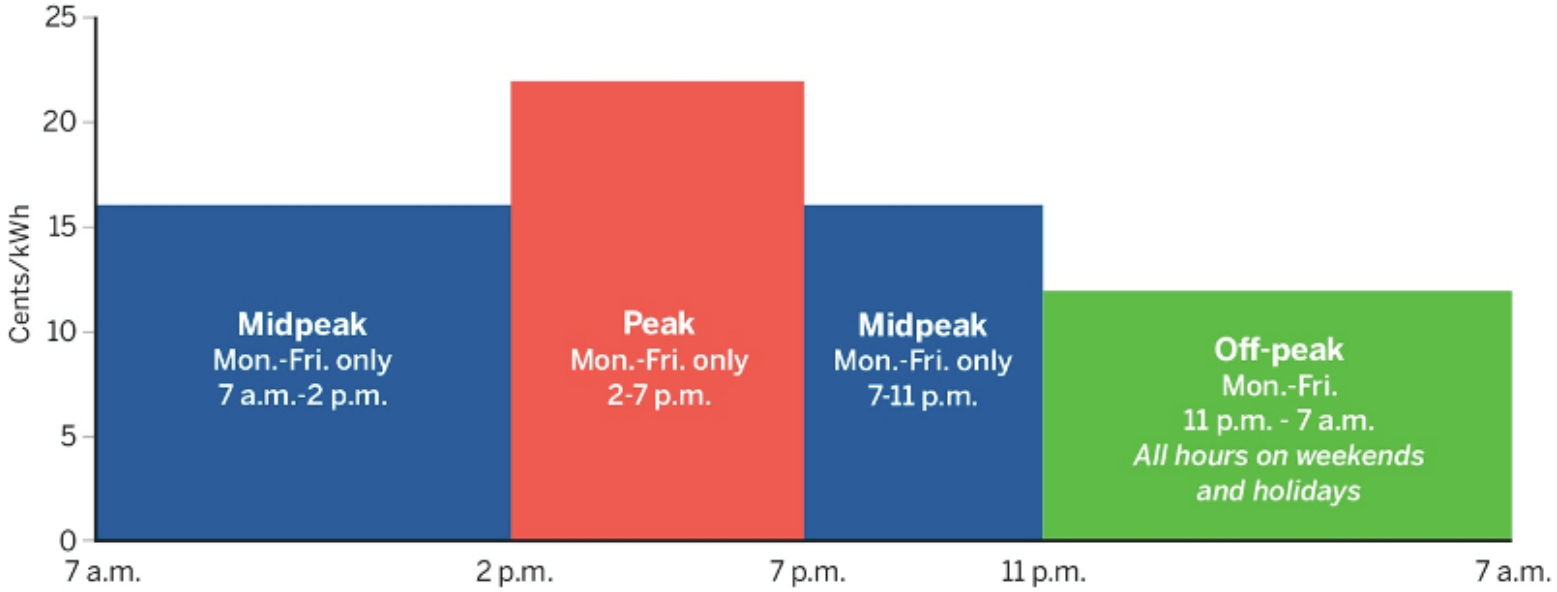
Fixed charge options

- Monthly customer charge
- System access charges
- Minimum bills

Energy charge options

- Volumetric rates
- Time-of-use rates

Figure 12. Illustrative three-period summer residential time-of-use rate



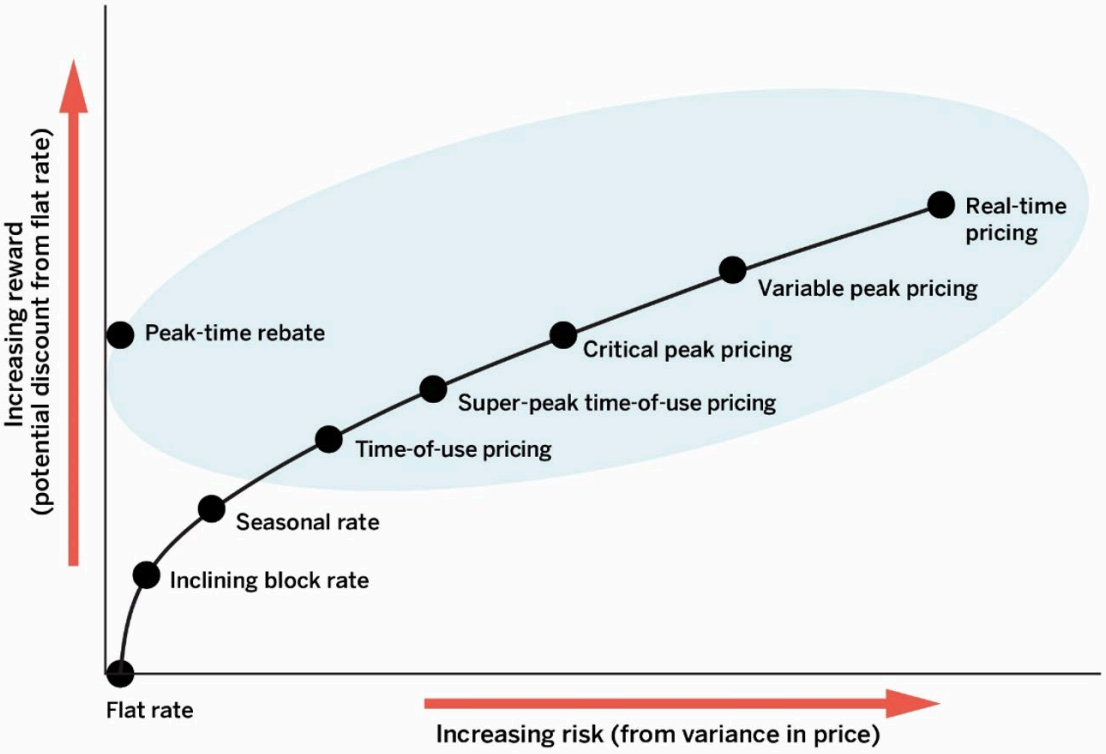
More energy charge options

- Targeted time-varying rates (critical peak pricing, peak time rebates, real-time pricing and so forth)

- Bidirectional kWh charge

Comparing energy charge options

Figure 13. Representation of customer risk-reward trade-off in time-varying tariffs

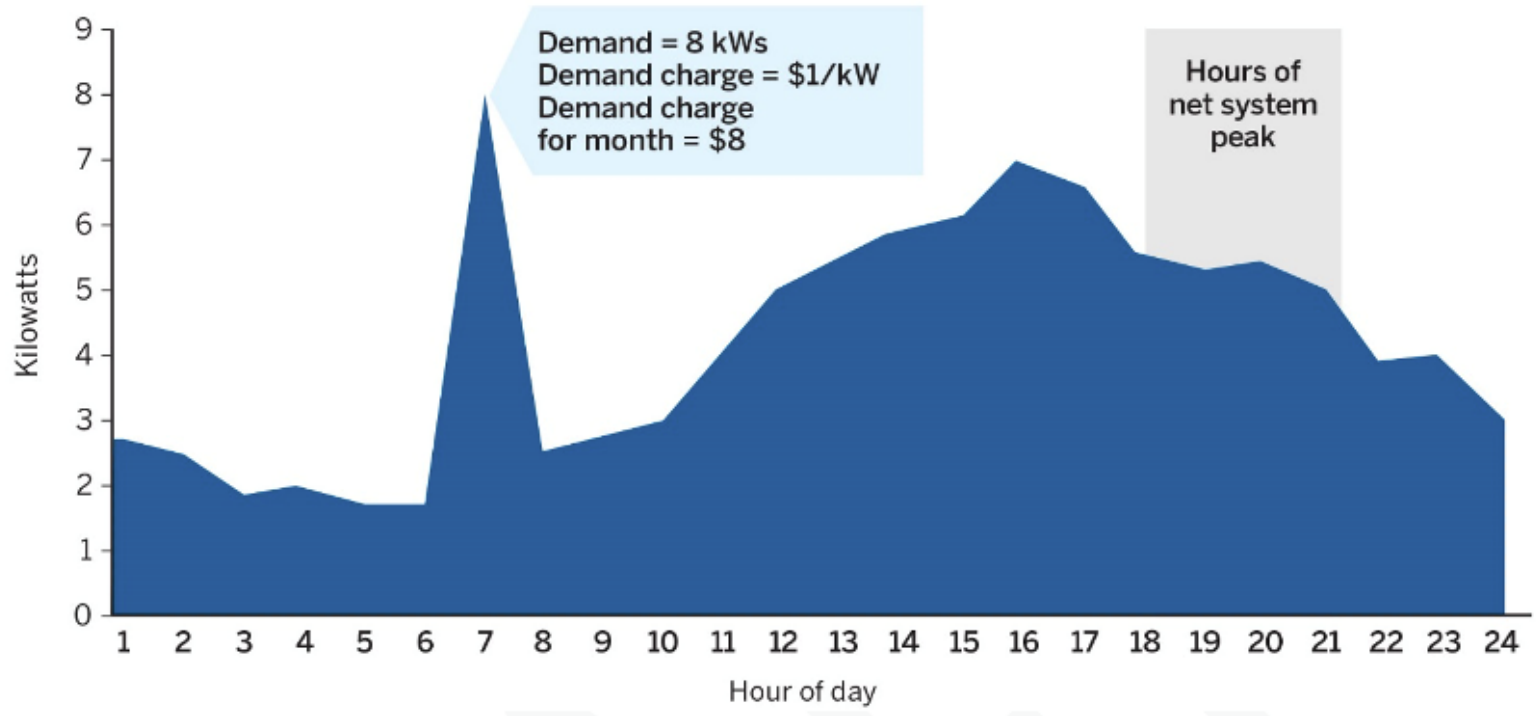


Source: Faruqui, A., Hledik, R., and Palmer, J. (2012). *Time-varying and dynamic rate design.*

Demand charge options (NCP)

- Non-coincident peak demand charges

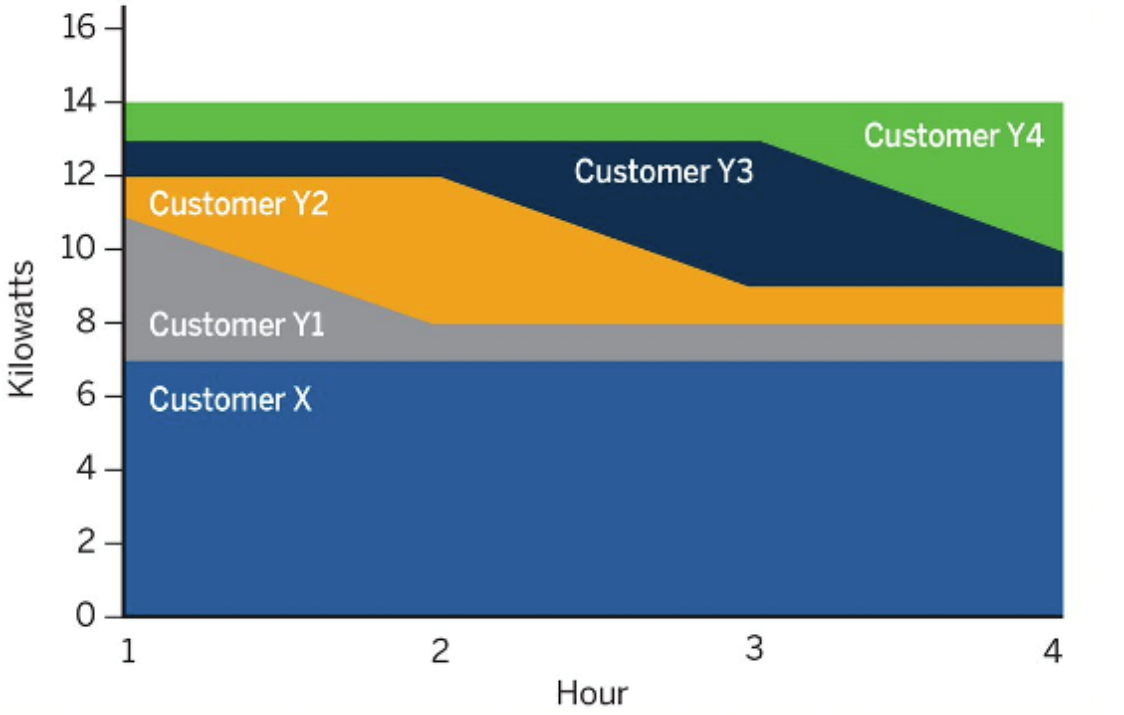
Figure 14. Illustrative monthly noncoincident peak demand charge for an individual residential customer



Demand charge options (peak window)

Peak window demand charges

Figure 15. Customer load comparison illustrating ability to share capacity



More demand charge options

- Contract demand charges
- Daily demand charges
- Standby charges

Export credit value options

- Volumetric versus monetary crediting
  - Trend is toward monetary crediting
- Monetary export credit options
  - Retail rate options
  - Value of Solar options
  - Market price options
  - Comparative resource option value (AZ)
  - Value of DER (VDER) option

The VDER option components

- VDER is the sum of:
  - An hourly wholesale energy rate
  - A capacity value (structure depends on technology)
  - An avoided delivery cost credit (may be location specific)
  - An environmental credit (eligible technologies)
  - Community credit for community DG
- Some components are time-varying

Applying credits to bills

- Credited without limitation
- Credits limited to like time period, location and/or parts of the customer's bill
- Rollover and cash out

Open discussion until 2:50 pm

10-minute break until 3 pm

Section 6: Reforms to Consider and Evaluation of Potential Pathways

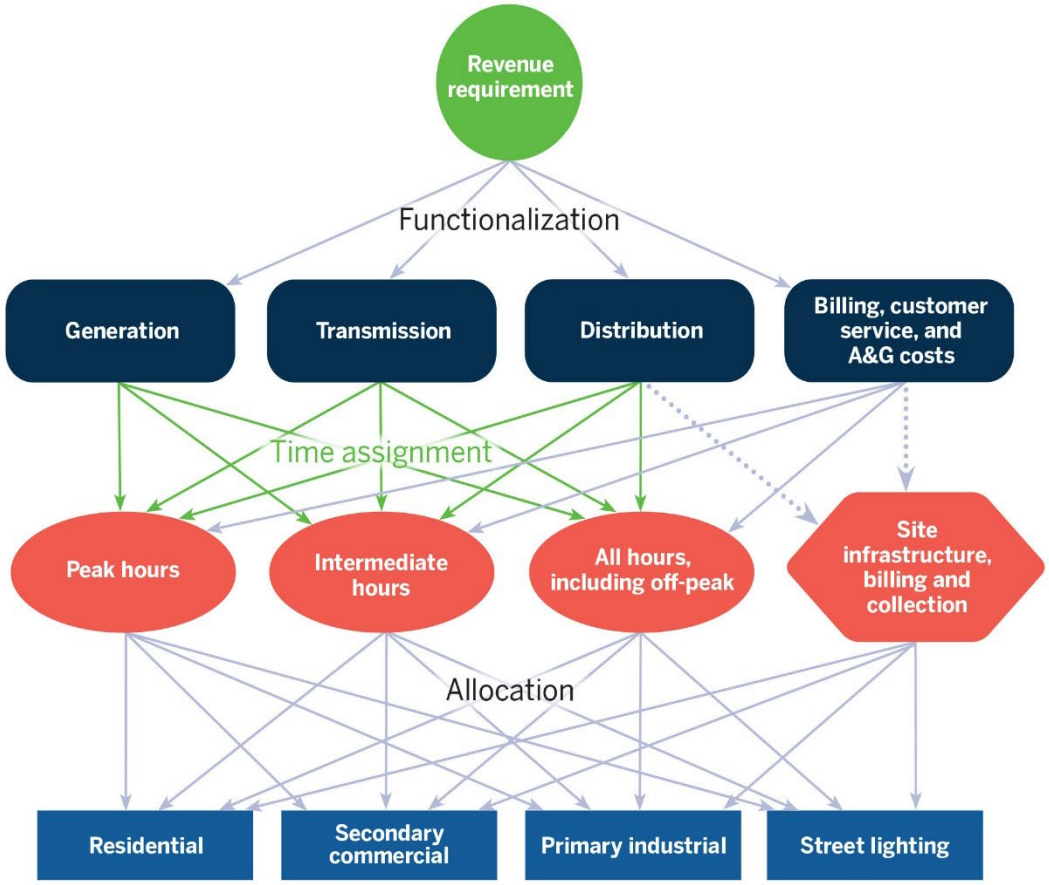
Key evaluation criteria

- Fair cost allocation
- Efficient customer price signals
- Customer understanding and acceptance
- Administrative feasibility

Data collection, customer classes and cost allocation reforms

- Data collection is foundational and getting the right data can enable further reforms
- Potential to define new technology-neutral customer distinctions, but comes with challenges
- New data and analytical tools enable significant reforms to traditional embedded cost allocation methods

Time-based classification and allocation for shared system costs



Potential pathways for residential DER rate design

- Gradual evolution pathway
- Advanced rate design for DER pathway
- Customer choice and stability pathway

Gradual evolution pathway

- Customer treatment
  - New DG customers, and any new storage/V2G customers who wish to export, are placed on year-round time-of-use rates by default
- Metering and billing framework
  - Inflow/outflow framework is maintained, as well as export credits defined by supply rate
- Rate and credit design
  - Default TOU rate design includes supply and distribution
  - Tiered customer charge adders for site infrastructure costs for all residential customers
- Process reforms
  - Supportive data collection and cost allocation reforms would be helpful

Gradual evolution pathway

- Fair cost allocation
  - Inflow/outflow framework ensures contribution to all relevant costs
- Efficient customer price signals
  - Improvements to rate design better align with cost causation for modest subset of customers
- Customer understanding and acceptance
  - Only small number of customers will be impacted by TVR requirement
  - Tiered customer charge adders may require customer education
- Administrative feasibility
  - Little additional process needed
  - Each residential customer needs to be categorized for tiered customer charge adders

Advanced DER rate design pathway

- Customer treatment
  - Advanced residential subclass defined by all customers with DG, EVs, storage, or high usage (e.g., 75th percentile or higher)
- Metering and billing framework
  - Netting within each time period for customers that export
  - Export credits defined by value within each time period
- Rate and credit design
  - Granular system of marginal cost charges and credits for generation, transmission, and distribution including critical peak pricing
    - Environmental value for eligible technologies requires transfer of RECs
  - Three rate elements that are only for cost recovery
    - Basic customer charge
    - Demand charge for site infrastructure
    - Distribution flow charge on imports and exports to recover portion of distribution costs, nonbypassable charges, and share of A&G costs
- Process reforms
  - New processes and analyses to support marginal cost charges and credits, as well as site infrastructure demand charge and distribution flow charge

Advanced DER rate design pathway

- Fair cost allocation
  - Moving away from inflow/outflow is justified by new cost recovery mechanisms
- Efficient customer price signals
  - Major leap forward on the cost causation basis of rates for significant portion of residential customers
- Customer understanding and acceptance
  - Increased complexity for significant number of customers would require significant customer education efforts
- Administrative feasibility
  - Significant new processes would require time and resources from MPSC and stakeholders
  - Complexity also increases risk of implementation difficulties

Customer options and stability pathway

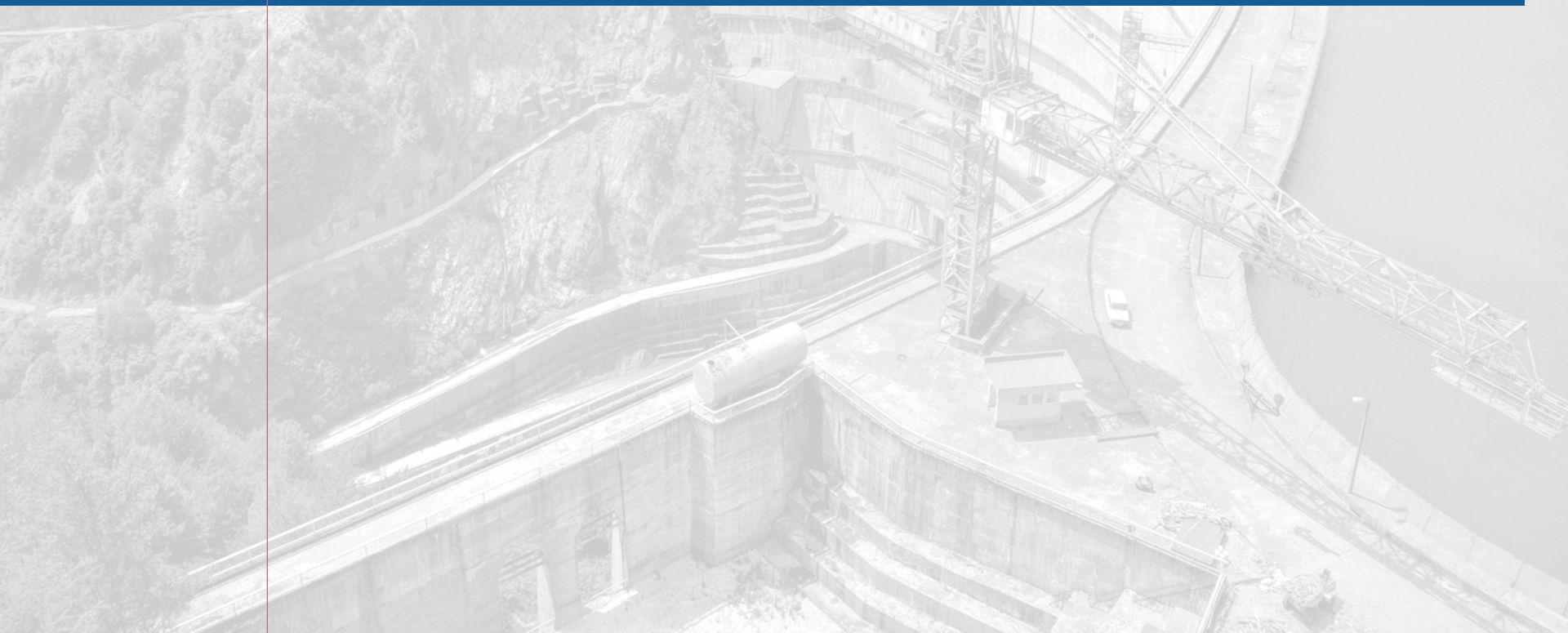
- Customer treatment
  - Two choices for new DG customers
  - Pre-existing DG customers can opt into new choices
- Metering and billing framework
  - Choice A: buy-all/credit-all with value-based credits
  - Choice B: monthly netting with value-based credits for net excess generation, with grid access charge
- Rate and credit design
  - Flat kWh credit values for solar PV and other nondispatchable technologies are set administratively every two years based on an estimated long-term value of the resource.
    - Customers can elect to lock in credit value or have it updated
    - Environmental value for eligible technologies requires transfer of RECs
  - Under Choice B, grid access charge is designed to recover share of distribution and nonbypassable costs
- Process reforms
  - Administrative structure to define value-based credits for
  - New analysis and stakeholder discussions to define grid access charge for Choice B

Customer options and stability pathway

- Fair cost allocation
  - Moving away from inflow/outflow is justified by other changes to framework
- Efficient customer price signals
  - Flat value-based credits provide link between customer investment and value, but little other incentive for improved customer behavior
- Customer understanding and acceptance
  - Little risk of customer confusion over rate design, but acceptance of options and potential differences between customers may require justification
- Administrative feasibility
  - Significant new effort to set credit values
  - Practical details, such as treatment of storage, need to be sorted out under this framework

Open discussion until 4:15 pm

Next Steps



Next Steps

- If submitting written comments, please send to Kevin Krause by September 22nd
  - KrauseK@michigan.gov
- Final report will be published on Monday, Nov. 1st

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

Carl Linvill
Principal
+1 775 450 0603
clinvill@raponline.org

Mark LeBel
Associate
+802 498 0732
mlebel@raponline.org