Distribution System Planning Fundamentals I

National Association of State Energy Officials – Distribution System Planning Training

Lisa Schwartz

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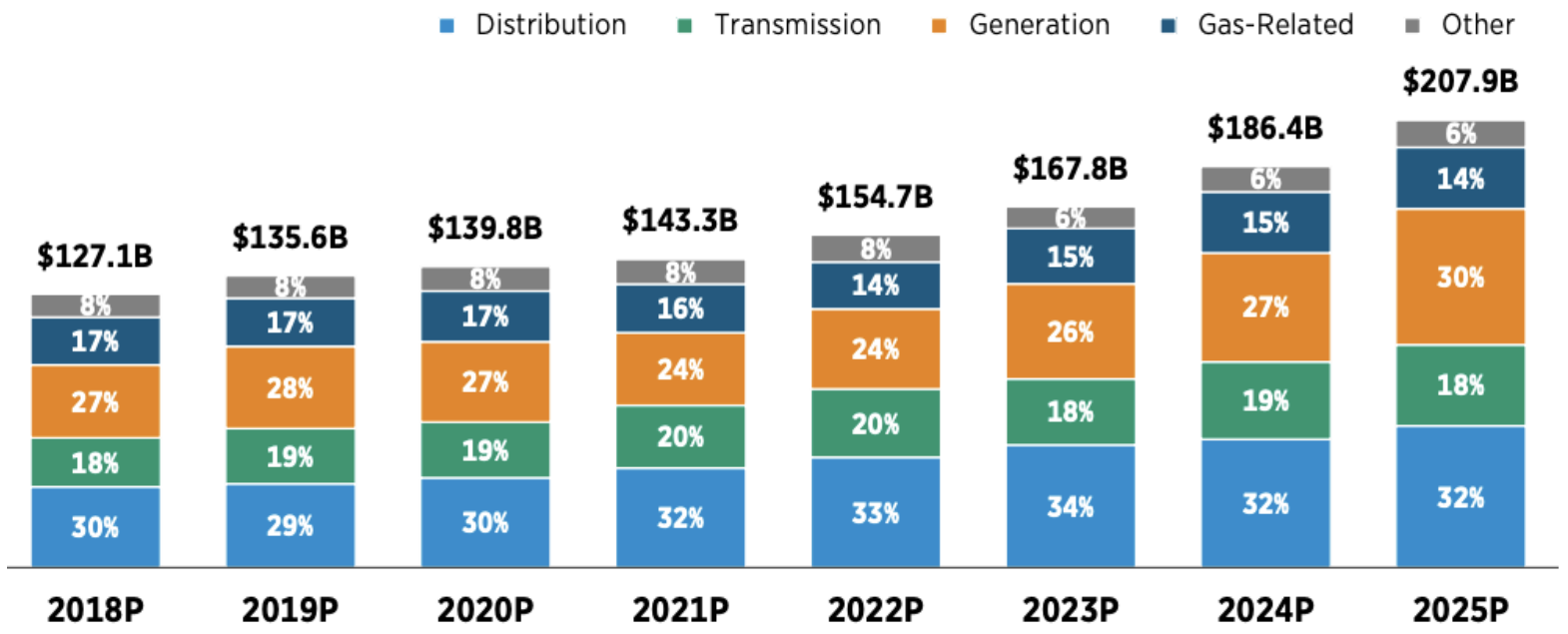
Overview

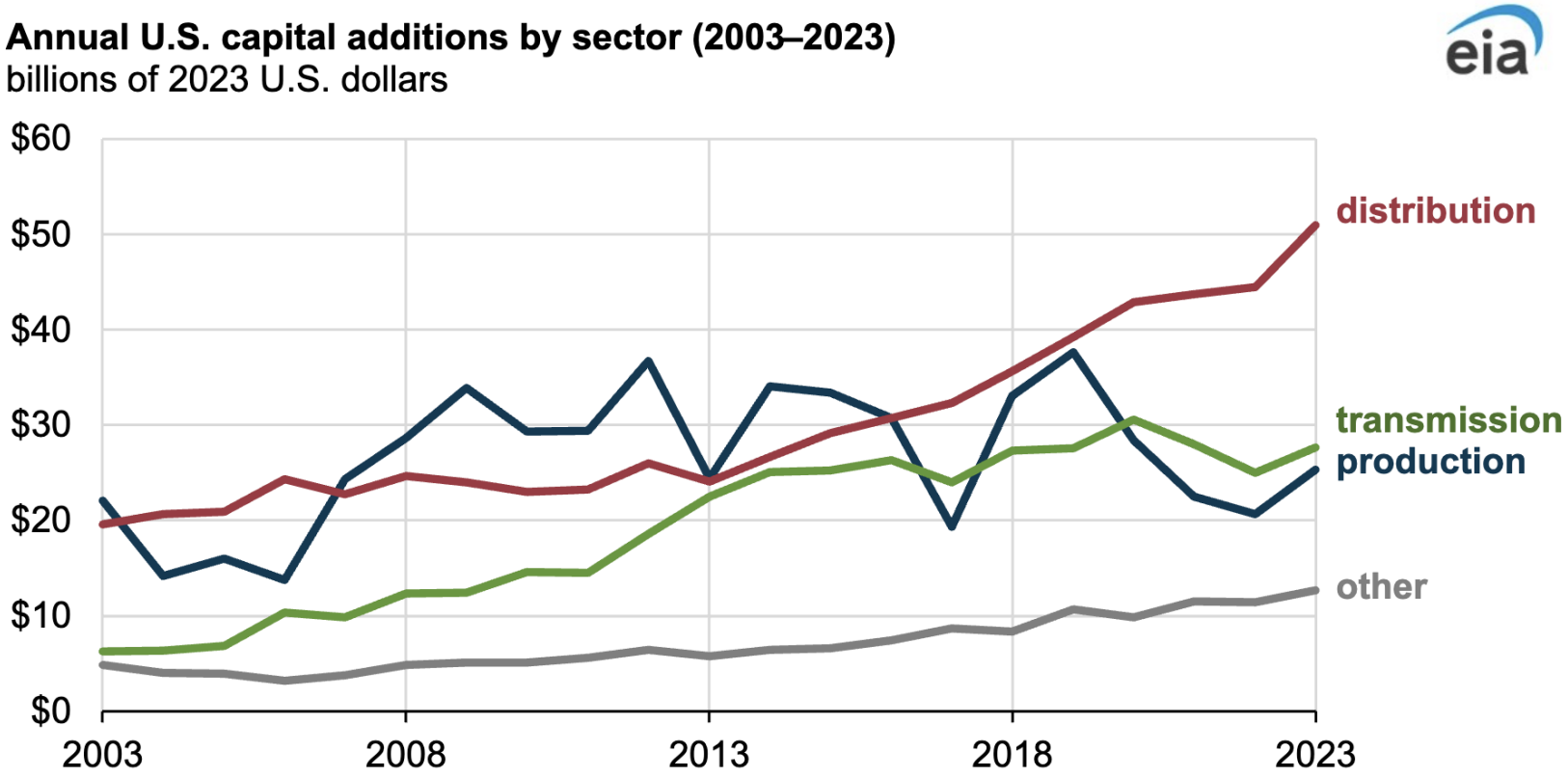
Why is transparent and coordinated planning increasingly important?



Distribution system investments accounted for the largest portion of capex — 32% in 2025 (estimated $66.0B) — for U.S. investor-owned utilities alone.

Source: EEI 2025

Distribution investments lead capital expenses for all types of utilities



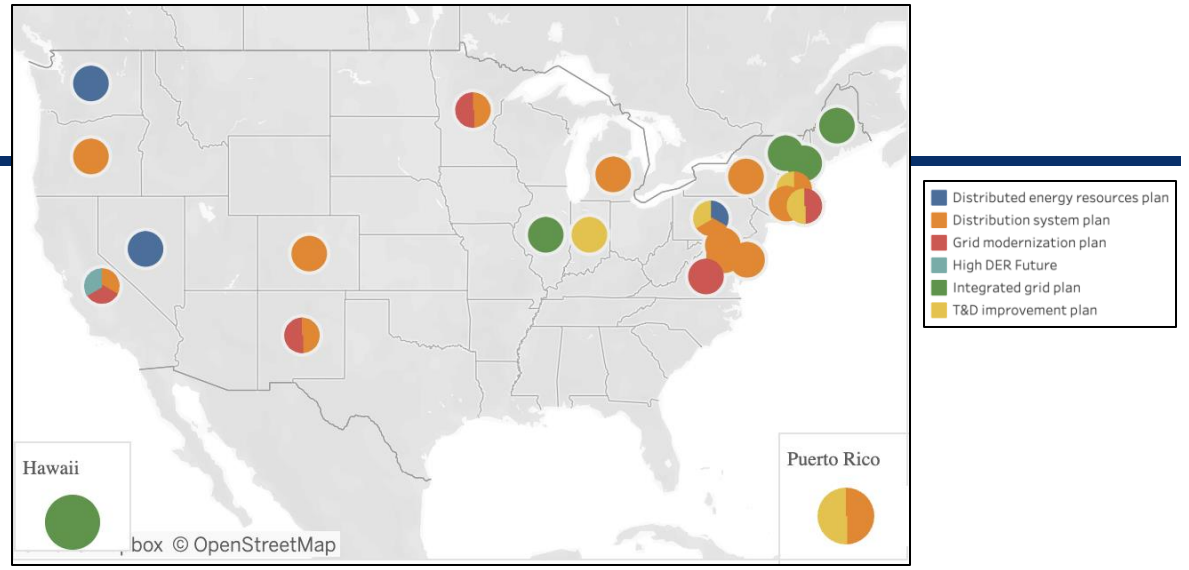
Source: Energy Information Administration

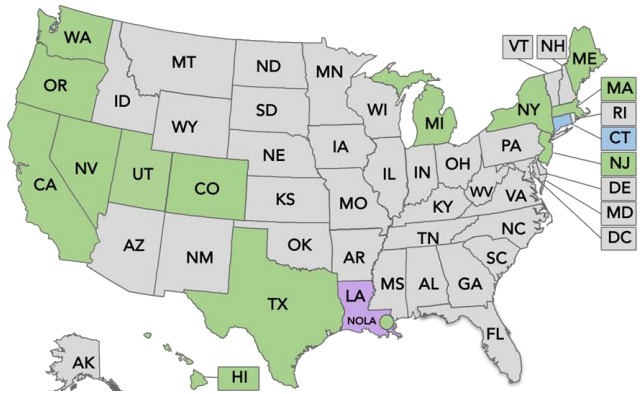
Capital spending on the distribution system…was the main driver of electricity spending increases over the last two decades. Capital investment in distribution infrastructure increased by $31.4 billion, or 160%, from 2003 to 2023. More than one-fifth of this increase occurred between 2022 and 2023….

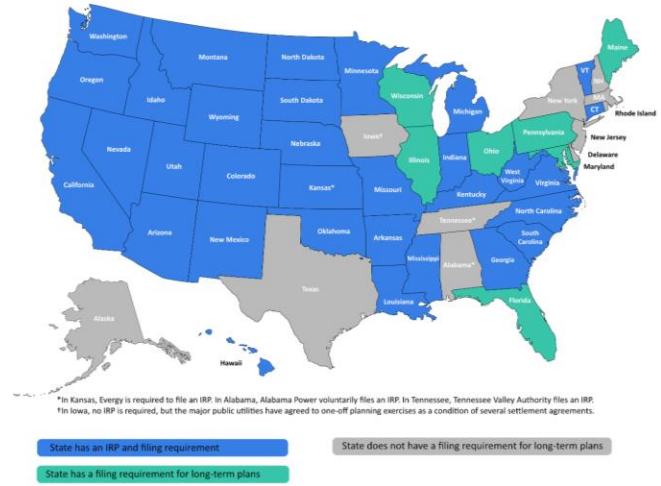
State planning requirements

- 22 states, DC and PR require regulated electric utilities to file some type of distribution plan
- Most states require some type of long-term plan for bulk power systems*
- ~15 states require grid resilience plans
- Planning is typically siloed
- Coordinating and integrating across plans can optimize grid investment strategies and address growing complexity at the grid edge

*See Extra Slide







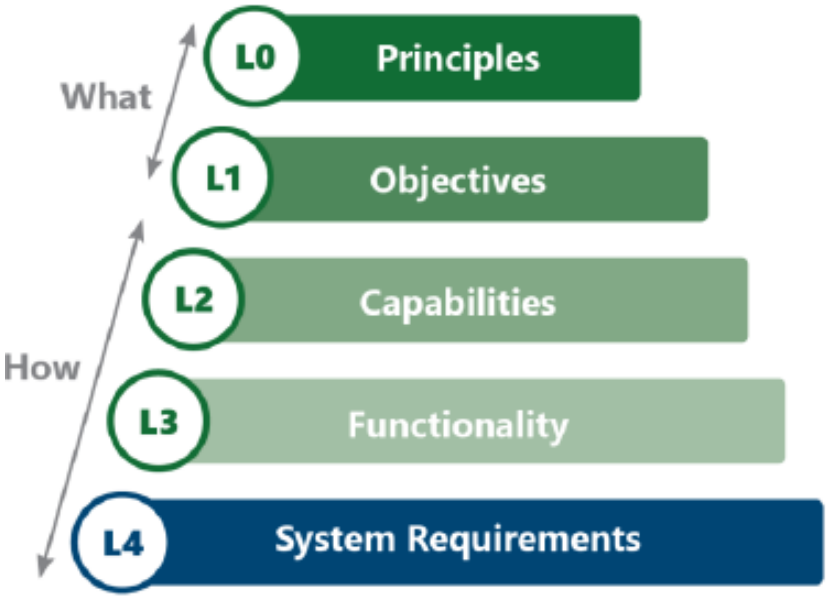
Sources (clockwise): LBNL 2025, LBNL 2024(a), LBNL 2024(b)

Types of distribution system plans

- **Distribution improvement plan** – Enables expedited cost recovery for specified types of system improvements
- **Grid modernization plan** – Strategy linking technology deployment roadmap to objectives
- **Distributed energy resource (DER) plan** – Considers ways to increase deployment and integration of cost-effective DERs
- **Integrated distribution plan** – Systematic approach to enable long-term grid investment strategies that address state and utility objectives, consumers' needs, and evolution at the grid edge — ideally, coordinated with bulk power system planning

Integrated distribution system planning

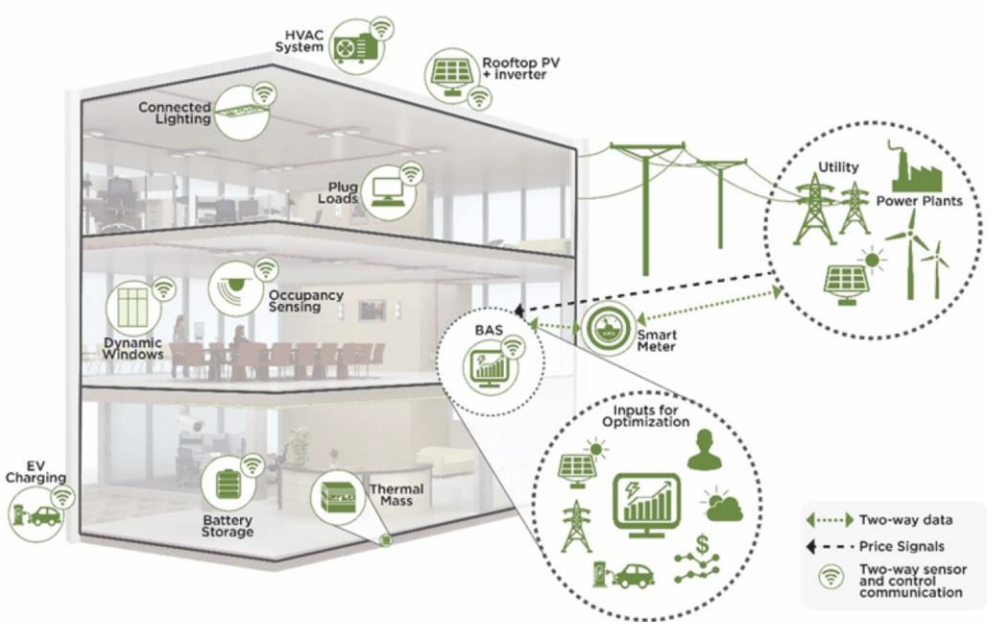
- State goals and objectives define **long-term, high-level outcomes** for grid planning.
- That determines **grid capabilities** needed, which in turn establish **distribution system functionality and system requirements**.
- Grid planning objectives
  - **Traditional regulatory aims** — safety, reliability and affordability
  - **Other objectives** — such as planning for large new loads, enhancing resilience to new threats, improving asset utilization, accelerating deployment of new technologies and services, and better integrating and using grid-edge resources
- Grid planning objectives also reflect the importance of **transparency and stakeholder engagement**.



Source: DOE 2020

What are the potential benefits from an improved planning process?

- Provide better **oversight** of utility expenditures
- Make **transparent** utility plans for distribution system investments in a **holistic** manner, before they show up individually in rate cases
- Enable opportunities for **meaningful engagement** with stakeholders and regulators to improve outcomes
- **Consider uncertainties** under a range of possible futures (scenarios)
- **Consider all solutions** for least cost/risk (including grid-edge resources)
- Enable consumers and third-party providers to propose grid solutions and **participate in providing grid services** (e.g., grid-interactive efficient buildings)



Source: Guidehouse Consulting

Some indicators of success in distribution system planning

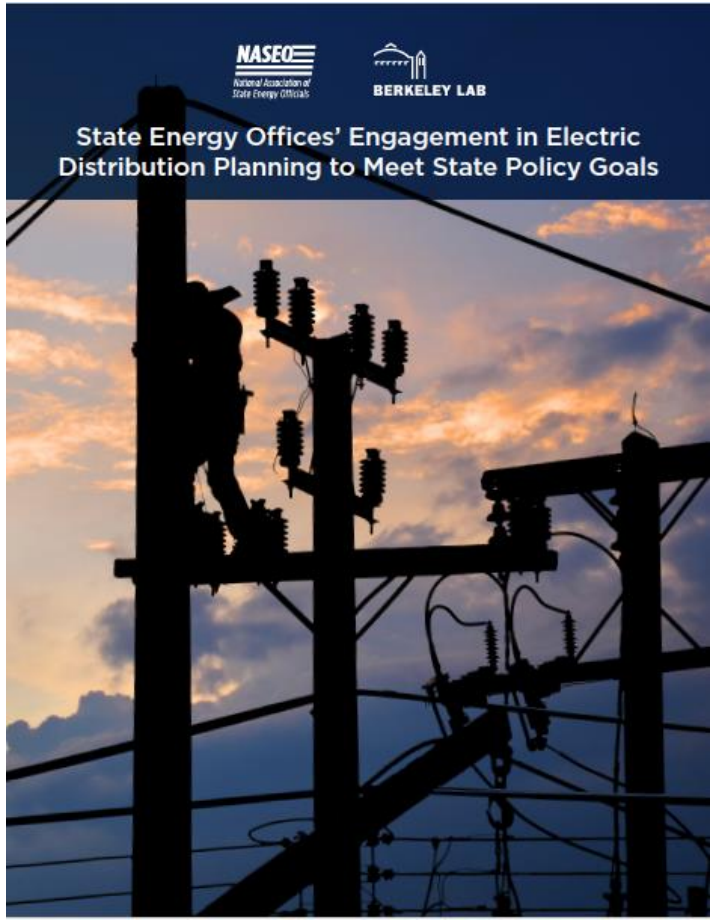
- **Stakeholder input is reflected** in utility plans.
- Utilities consider **all potential solutions** to meet grid needs, using **robust and transparent analysis**.
- Filed distribution system plans provide a **roadmap for grid investments, systems, and processes designed to achieve state and utility goals and objectives**, with utility priorities and timelines.
- Filings are **well-organized and documented**, specify how they meet regulatory requirements, explain how they are **coordinated with other utility and state plans**, and provide **useful information** for regulators and stakeholders.
- **Regulators provide feedback** to utilities on filed plans.
- The planning process **facilitates cost recovery of prudent utility investments** in grid modernization and DER integration and utilization.
- Utility **cost recovery requests are clearly tied to achieving state goals and objectives** and utility grid priorities.
- Utilities **track and report on progress** for implementing plans.

Source: Eversource

How can State Energy Offices engage?

State Energy Office activities supporting distribution planning (1)

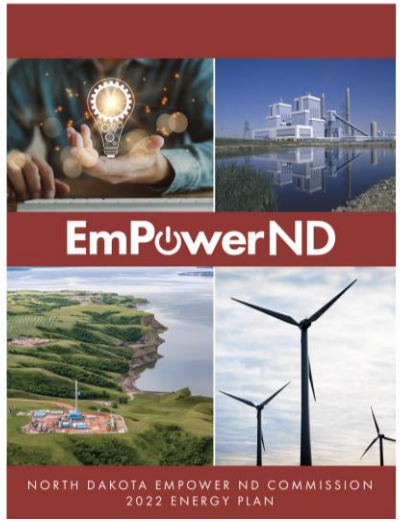
- **Conduct analyses that inform distribution plans**
  - Technical potential, cost-effectiveness evaluation, barriers and opportunities for technologies (e.g., MA grid services study and GA Tech Flex project)
  - State-of-the-grid analyses (e.g., NM reports on baseline of state's electricity system and grid modernization assessment, NY Transportation Electrification Distribution System Impact Study)
  - State-level forecasts and scenarios that can inform grid planning (e.g., CA Integrated Energy Policy Report)
- **Establish state energy strategy that considers distribution-level investments** (e.g., KY Designs for a Resilient Economy)
- **Convene stakeholders or participate in work groups**
  - Articulate state objectives and priorities to inform investment criteria and review inputs, assumptions, methodologies and results
  - Examples:
    - HI State Energy Office's Energize Kakou initiative
    - NM's Grid Modernization Advisory Group
    - MA Grid Modernization Advisory Council
    - RI Office of Energy Resources collaboration with town of Johnston and RI Energy

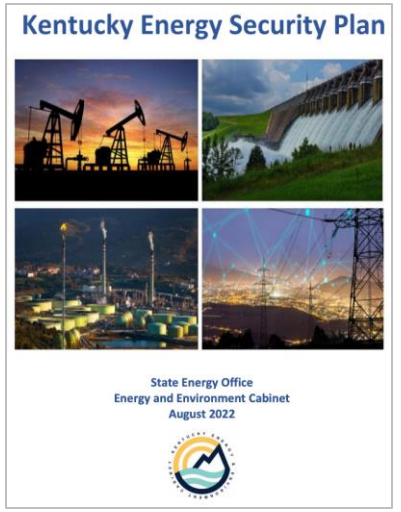


Report here

State Energy Office activities supporting distribution planning (2)

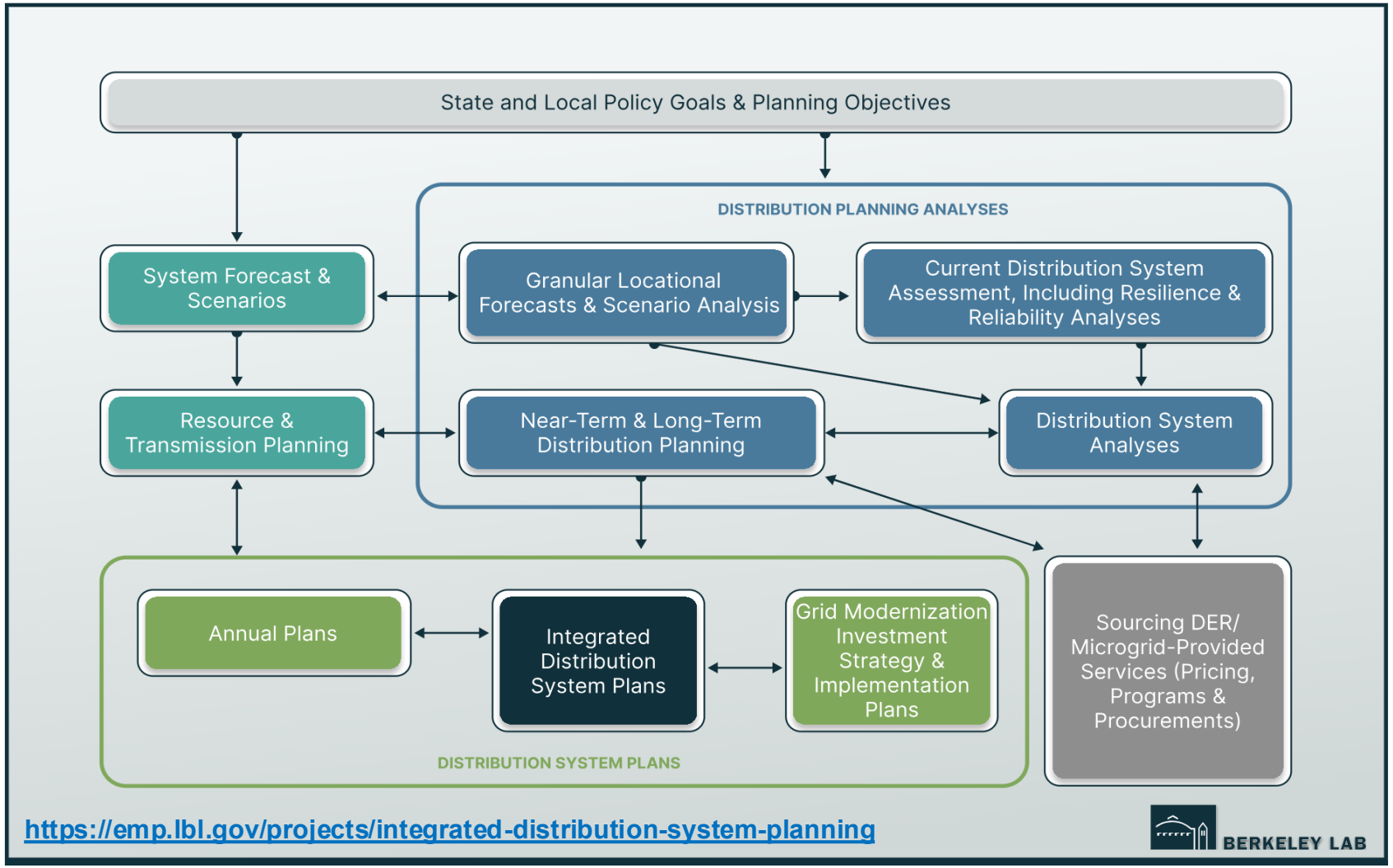
- **Incorporate distribution planning topics in state plans**
  - *State energy plans* – Make recommendations WRT distribution investments
  - *State Energy Security Plans* – Highlight resilience risks and provide insights into potential priority utility investments and programs
    - Utilities can consider the data, methods, and priorities for their resilience plans — ideally filed as part of an integrated distribution system plan
- **Reduce barriers to siting and permitting of local generating & storage resources**
- **Provide state and federal funding** for these resources and distribution infrastructure
- **Make recommendations on draft utility distribution plans**
  - For example, MA Office of Energy Resources reviews draft electric-sector modernization plans and provides recommendations for final plans to be reviewed by the utility regulator
- **Participate in regulatory proceedings**
  - Review forecasting assumptions for loads and local resources, assess reliability and resilience metrics, discuss affordability strategies, evaluate alignment with state energy plans, identify expenditure priorities that align with state objectives, review hosting capacity analysis, provide input on evaluation of non-wires alternatives—including advanced building technologies for grid services, and encourage joint consideration of DERs and load growth for economic efficiency





Framework for Integrated Distribution System Planning

Interactive decision framework for distribution system planning



What's in the box?

Overview

- What is it?
- Why is it important?
- Key questions (Q&A)

Roles and Responsibilities

Best Practices

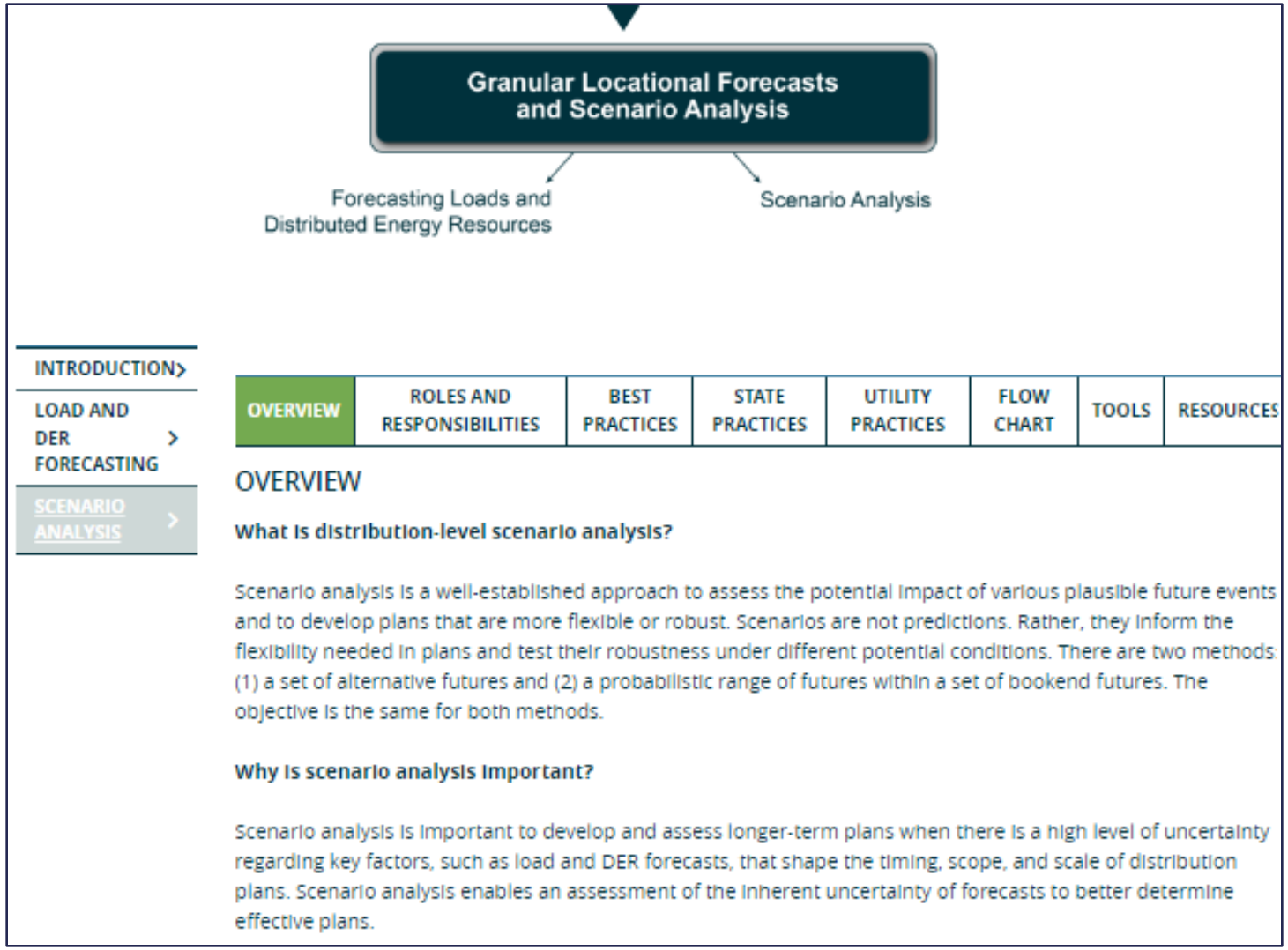
State Practices

Utility Practices

Flow Chart (e.g., inputs/outputs)

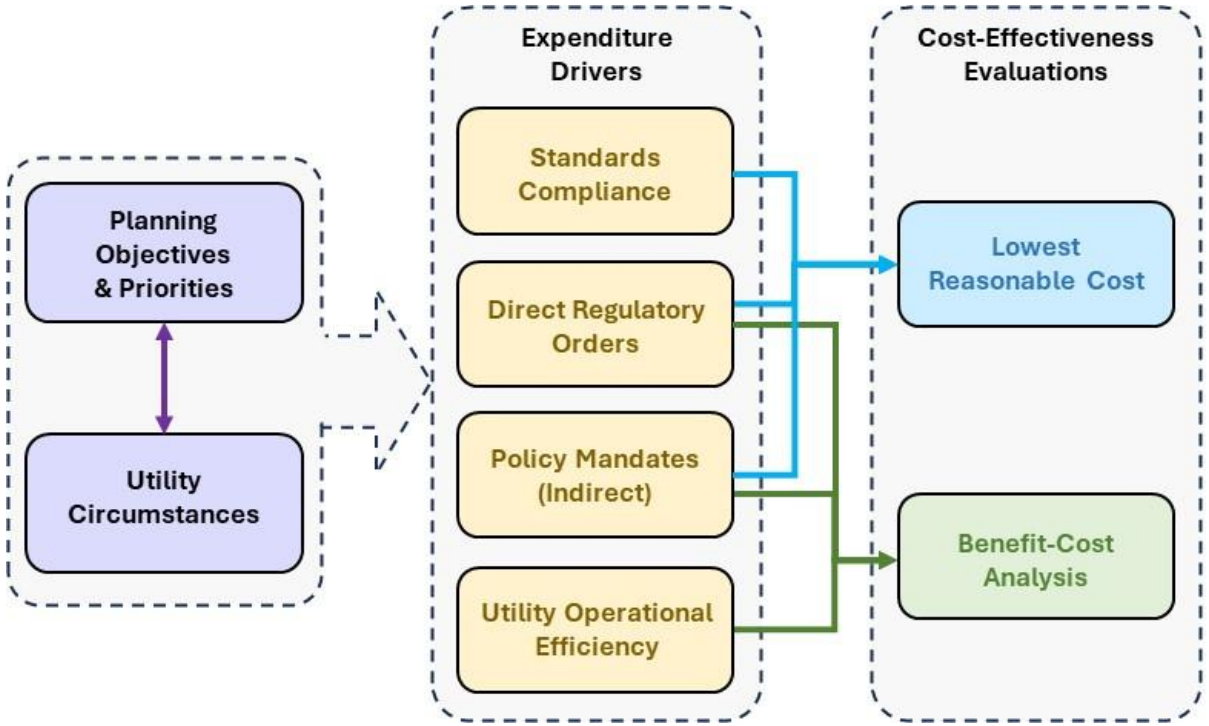
Tools

Annotated Resources List



What topics are included?

- ☐ Stakeholder Engagement
- ☐ Forecasting Loads and DERs
- ☐ Scenario Analysis
- ☐ Threat-Based Risk Assessment
- ☐ Worst-Performing Circuits Analysis
- ☐ Asset Management Strategy
- ☐ Cost-Effectiveness Framework for Investments
- ☐ Multi-Objective Decision-making
- ☐ Coordinated Planning
- ☐ Hosting Capacity Analysis
- ☐ Value of DERs
- ☐ Interconnection
- ☐ Distribution Investment Strategy
- ☐ Functional Requirements Analysis
- ☐ Geotargeting Programs
- ☐ Procurements

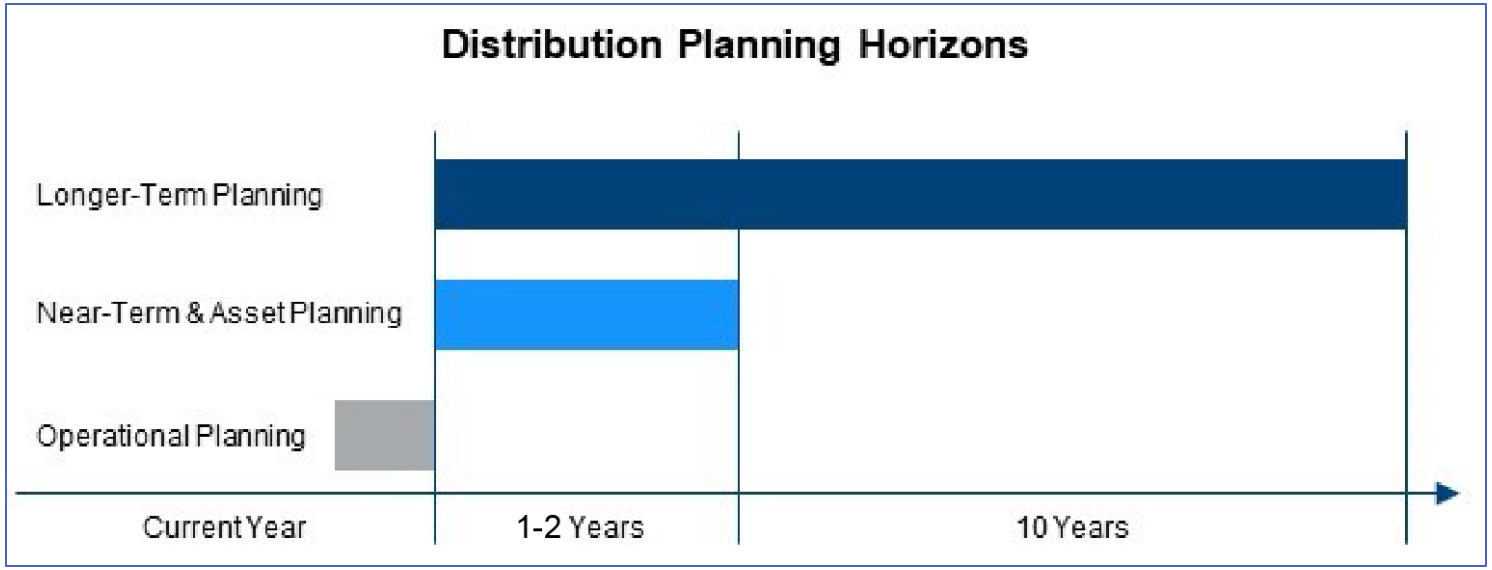


Source: De Martini, P., L. Schwartz, and J. Ball. 2025. *Economic Evaluation of Modernization Expenditures for Electric Utility Distribution Systems: A Guide for Utility Regulators*. Lawrence Berkeley National Laboratory

Examples of Leading Practices

Filing frequency and planning horizon

- Utilities conduct distribution planning annually
  - Updating solutions and cost estimates every 1–2 years
- Long term capital plan
  - Ranges from 5–10 years
  - Sweet spot: 10 years
- Plan filing frequency
  - Ranges from 2–5 years
  - Sweet spot: 2–3 years

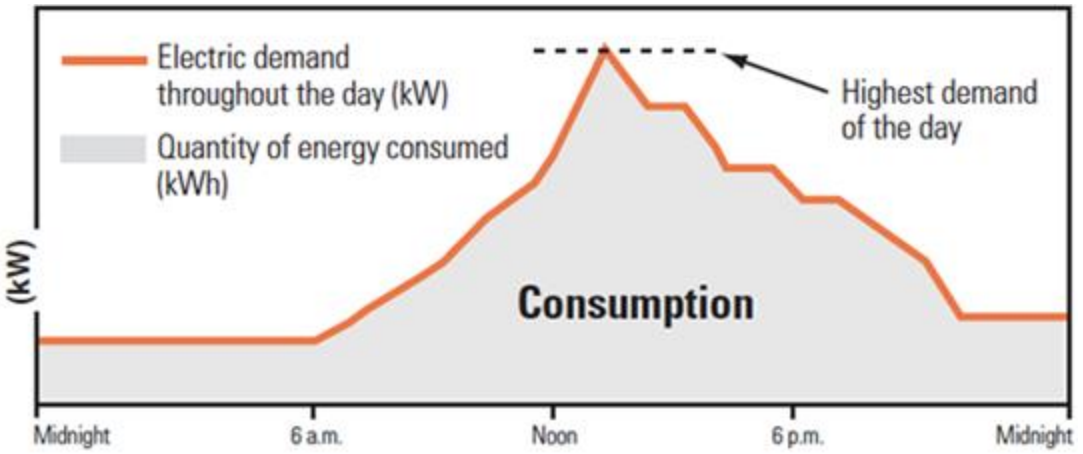


DOE 2020

Forecasting

- Identify **parameters and design temperatures** used in gross load forecasts*
- Describe **criteria** for including **large new loads** in the forecast
- Provide **feeder-level adoption estimates** for DERs and load-modifying technologies
- Estimate peak demand and DER impacts **by circuit**
- Develop **forecasts for scenarios** with different technology adoption levels and operations
- Provide **hourly load shapes for peak days** that include the impacts of DERs and load-modifying technologies

Utilities estimate peak demand and DER penetration at specific locations on the distribution system to inform timing, need, and type of distribution system investments.



We Energies

*Projected load trends without accounting for DER impacts

Scenario analysis

- Describe **structure** of scenarios used and **uncertainties** that each scenario addresses
- Document **assumptions** that differentiate scenarios
- Provide narrative descriptions that **identify risks and challenges**
- Report **scenario-specific data**

Scenario analysis examines a range of plausible futures based on potential trajectories of planning drivers. Scenarios can identify challenges and risks that the distribution system may face and manage uncertainties by analyzing a range of conditions.

DTE (MI) 2023 DSP Grid Modernization Scenarios

Scenario	Description
Electrification	High electrification of transportation, buildings, and industrial processes
Increasing CAT Storm	Increased frequency and intensity of catastrophic (CAT) storm threats to electric infrastructure
DG/DS	High adoption of distributed generation (DG) solar PV and distributed storage (DS) as batteries behind the meter (BTM)

Worst-performing circuits

- Describe performance metrics, interruptions excluded from metric calculations, and screening criteria for circuit identification
- Report detailed data on worst-performing circuits (e.g., event history, reliability performance history)
- Provide detailed information on remediation plans (e.g., cost, timeline, and description of planned actions)

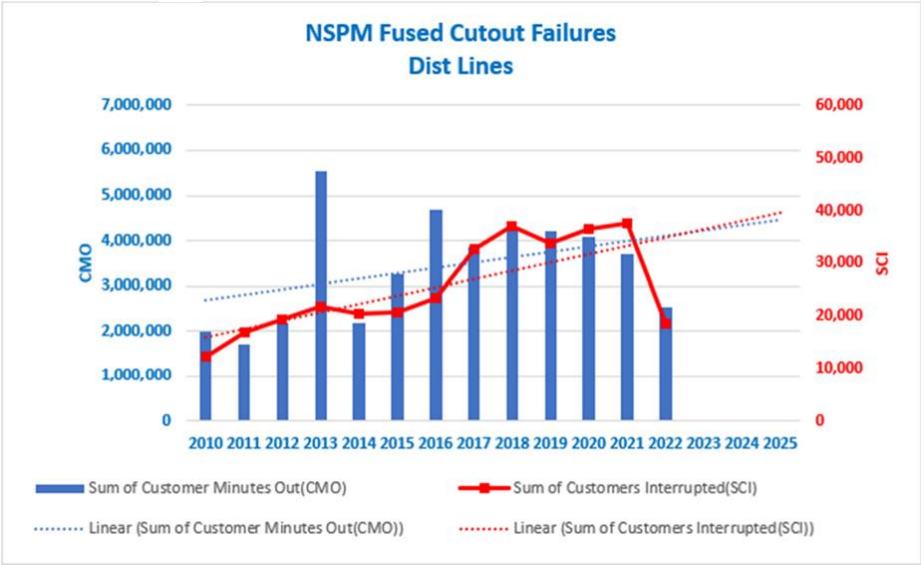
Utilities analyze the duration, frequency, and number of customer service interruptions to identify circuits (feeders) with the worst reliability and develop remediation plans.

EPRI

Asset management strategy

- Identify criteria for assessing asset condition
- Provide data to demonstrate need for new programmatic investments and assess program impact and effectiveness
- Discuss equipment selection and design practices and how changing grid conditions may impact them

Utilities establish an inventory of distribution system assets, analyze their condition and performance, and make capital and maintenance spending decisions to efficiently maintain system safety and reliability.

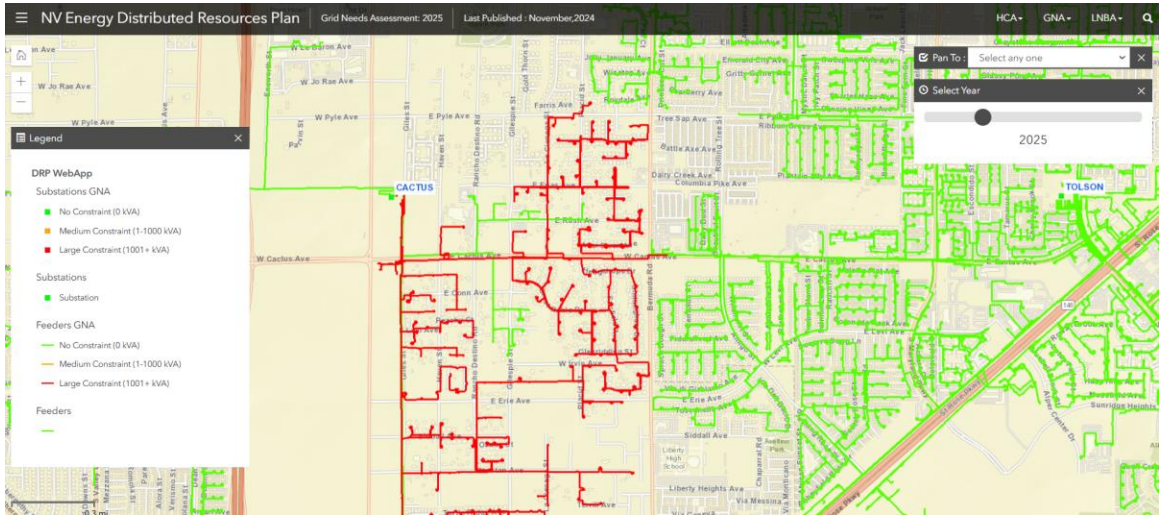


Xcel Energy (MN) 2023 IDP

Grid needs assessment

- Make grid needs transparent
- Explain how the utility prioritized grid investments
- Leading practices include:
  - Sharing grid deficiency data to enable identification of cost-effective solutions
  - Disclosing commercial and utility-developed tools used and role in the analysis
  - Using portals to facilitate stakeholder access to data

The grid needs assessment describes specific grid deficiencies over the planning period, engineering characteristics, and timing of the need. The assessment informs the utility's investment strategy, including both traditional grid upgrades and pricing, programs, and procurements for non-wires alternatives.



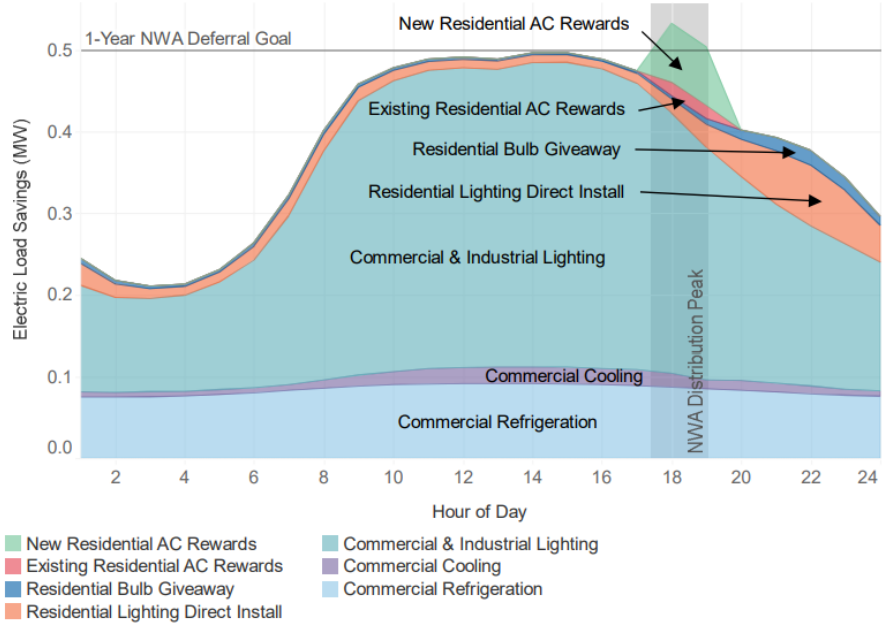
Source: NV Energy, Distributed Resources Plan Portal

Geotargeted programs

- Provide data that specifies program goals
- Share data on the locational and temporal characteristics of the targeted grid need and program operational requirements
- Report data on eligible measures and expected measure performance
- Regularly report on program effectiveness and progress

Utilities deploy geotargeted programs to reduce load growth for specific locations on the distribution system and reduce the need for system upgrades. These programs typically provide utility customers incentives to adopt measures such as demand flexibility, onsite generation and storage.

Expected measure performance for geotargeted program



Source: Xcel Energy's Geotargeted Distributed Energy Initiative

Non-wires alternatives procurements

- Clearly describe criteria for NWA suitability
- Document methods and assumptions for technical and cost-effectiveness screening
- Use a technology-agnostic portfolio approach
- Present detailed information on NWA opportunities (e.g., location, timing, and magnitude of grid need)
- Provide adequate grid data to developers for competitive solicitations
- Use standard agreements
- Create a performance evaluation framework that includes data requirements and performance metrics

Utilities can use NWAs to provide grid services at specific locations on the distribution system to reduce, defer, or avoid the need for upgrade projects that meet suitability criteria

Criteria	Potential Elements Addressed	
Project Type Suitability	Project types include Load Relief or Load Relief in combination with Reliability.	
Timeline Suitability	**Large Project** (Projects that are on a major circuit or substation and above)	• 36 to 60 months
	Small Project (Projects that are feeder level and below)	• 18 to 24 months
Cost Suitability	**Large Project** (Projects that are on a major circuit or substation and above)	• No cost floor
	Small Project (Projects that are feeder level and below)	• Greater than or equal to $450,000

Source: Consolidated Edison, Distribution System Implementation Plan, June 2023

Questions states can ask

- How do utilities in your state conduct distribution planning? What practices are they using — e.g., for forecasting, grid needs assessment, and solutions identification?
- If utilities are not sharing distribution plans in your state, why not?
- How are grid-edge resources considered in distribution planning — e.g., in the utility's forecasting, grid modernization strategy, technology roadmap, geotargeted demand-side management programs, and procurement of non-wires alternatives?
- How is electricity load growth for transportation and buildings considered in distribution planning?
- Are State Energy Offices, PUCs and utilities working together to maximize benefits of distribution system investments?
- Are the utility's proposed grid modernization investments achievable in the planning period, and are they appropriately prioritized when considering all other planned expenditures?
- Did the utility analyze alternatives to proposed investments and provide clear supporting information?

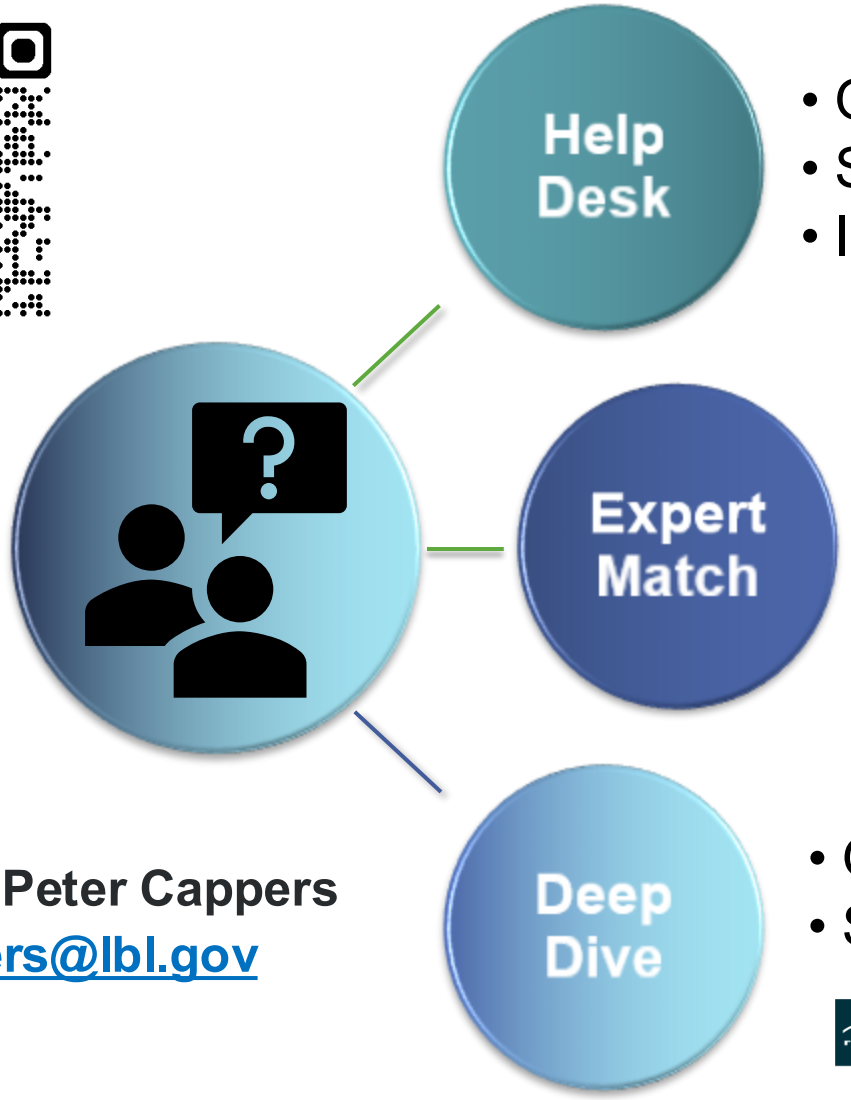
Actions states can take

- Establish clear goals, objectives and priorities for distribution system planning
- Request baseline data from utilities to understand the current state of distribution systems and distribution planning practices
- Open an informational proceeding to educate stakeholders on distribution planning
- Provide guidance to utilities on filing distribution plans for regulatory and stakeholder review
- Ask utilities to document data inputs and outputs, metrics, and analytical methods that support distribution plans
- Provide guidance to utilities on using multi-objective decision analysis to prioritize grid modernization and all other distribution expenditures to optimize value
- Consider developing a standard template for presenting information on costs and benefits of proposed investments

Resources for More Information

State Technical Assistance Program

https://emp.lbl.gov/projects/state-TA-program



- Online intake form with rolling review
- SME provides ≤**4 hours of support**
- Intake form and support available now

- Online intake form with rolling review
- SME provides ≤**100 hours of support**
- Intake form and support available now

- Opportunity to apply semi-annually
- SMEs provide **>100 hours of support**

Contact: Peter Cappers
PACappers@lbl.gov

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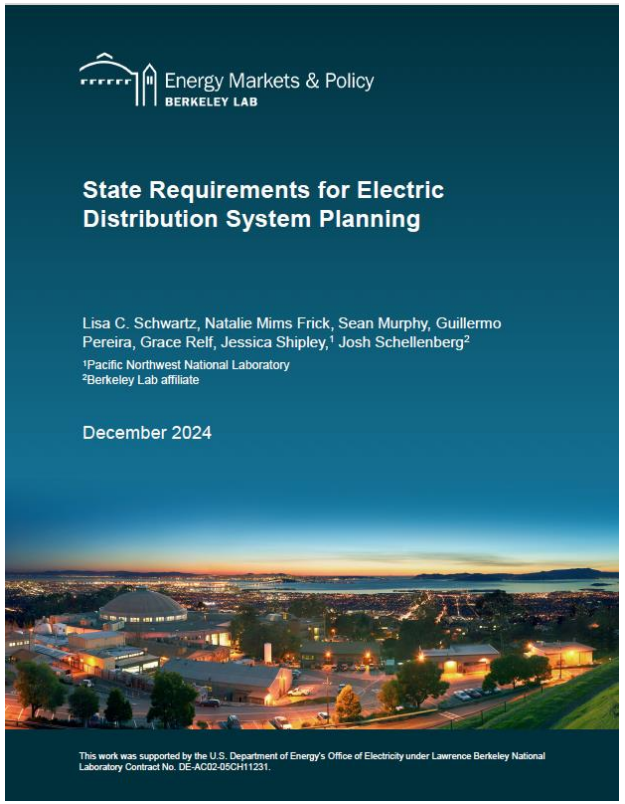
State requirements for electric distribution system planning

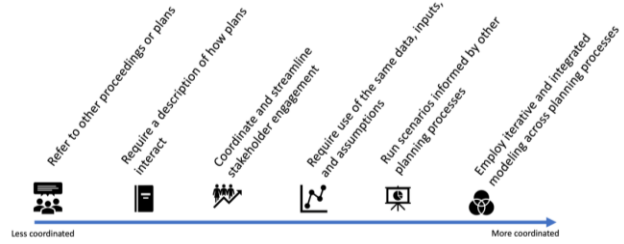
Report summarizes guidance from legislatures and regulators and identifies leading planning practices in 20 jurisdictions

- Goals and objectives
- Procedural elements
- Stakeholder engagement
- Forecasting loads and DERs
- Hosting capacity analysis
- Information on the current state of the distribution system
- Grid modernization strategy
- Grid needs assessment
- Non-wires alternatives (NWA)
- Reliability and resilience
- Pilots
- Coordination with other planning processes



Coordination of Distribution Planning With Other Plans

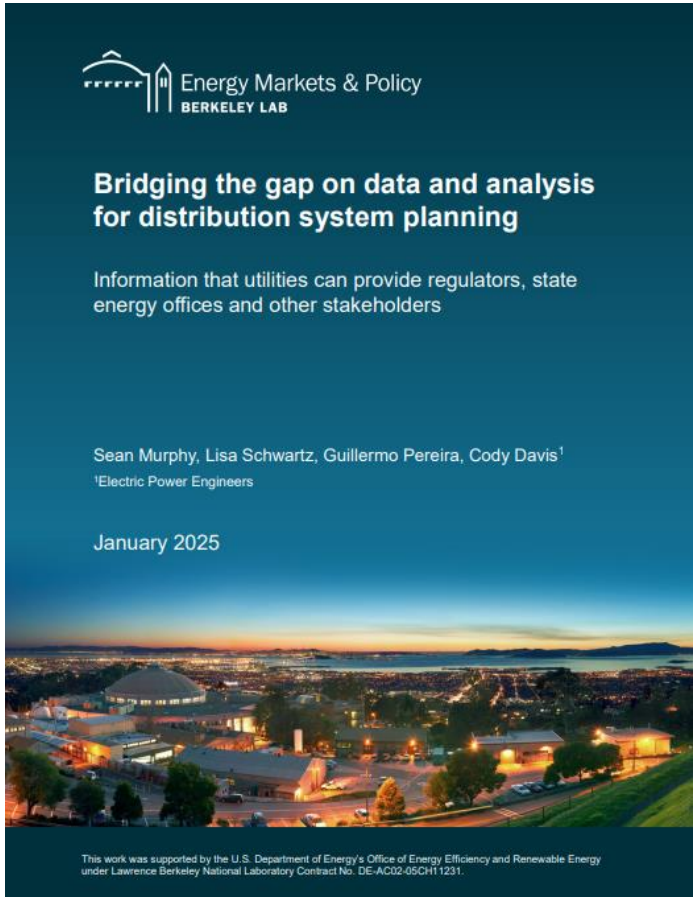
State	Bulk Power (IRP and Transmission)	DERs (including efficiency)	Electrification	Other Related Plans	Highest Level of Coordination
CA	●	●	●	●	
CO	●	●	●	●	
DC				●	
HI	●	●	●	●	
IL	●	●	●	●	
ME	●	●	●	●	
MA	●	●	●	●	
MI	●	●			
MN	●		●	●	
NV	●	●			
NM	●			●	
NH		●		●	
NY	●	●	●	●	
OR	●	●	●	●	
RI		●		●	
VT	●	●	●	●	
VA	●			●	
WA	●	●	●	●	



Bridging the Gap on Data and Analysis for Distribution System Planning

- Utilities conduct extensive analysis to develop distribution system plans. But regulators and stakeholders often do not know:
  - What data are available
  - How the utility uses the data in planning
  - How the data and analysis affect utility decisions

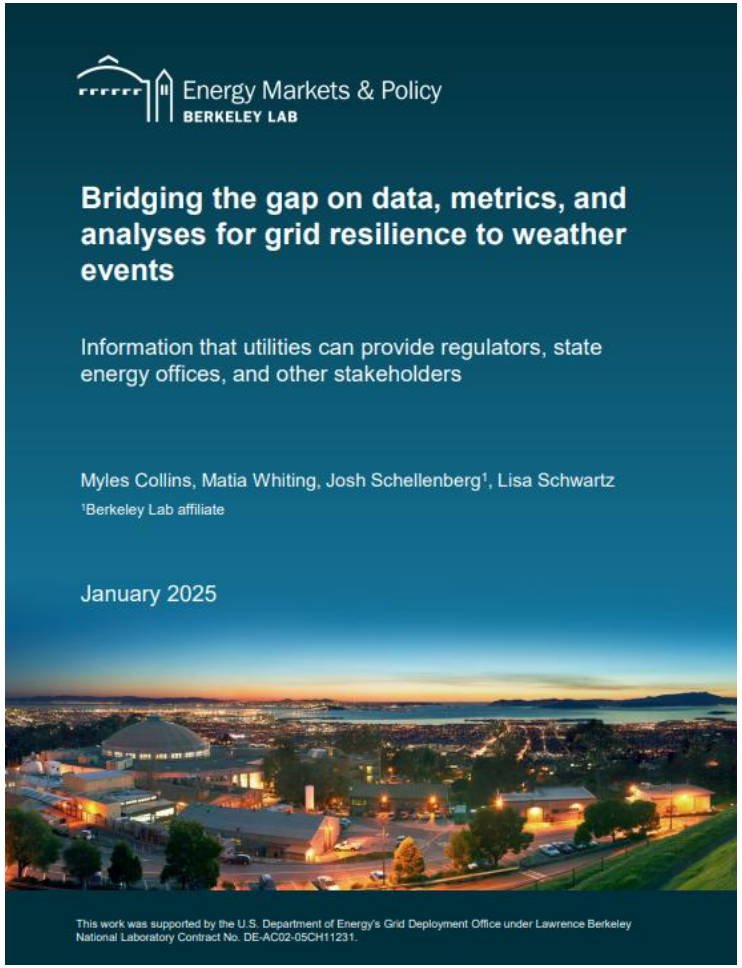
- This report aims to bridge the gap and increase understanding of:
  - The types of data, metrics, and analyses that utilities can provide to state agencies and stakeholders
  - The impact of data on planning and decision-making



Bridging the Gap on Data, Metrics, and Analyses for Grid Resilience to Weather Events

- Report reviews state requirements and utility plans focused on overall grid resilience, extreme weather event vulnerabilities, infrastructure modernization, storm protection, and wildfire mitigation

- Details types of data, metrics, and analyses and provides examples from utility plans for:
  - Vulnerability assessments
  - Hazards exposure
  - Attribute metrics
  - Performance metrics
  - Evaluation and prioritization analysis

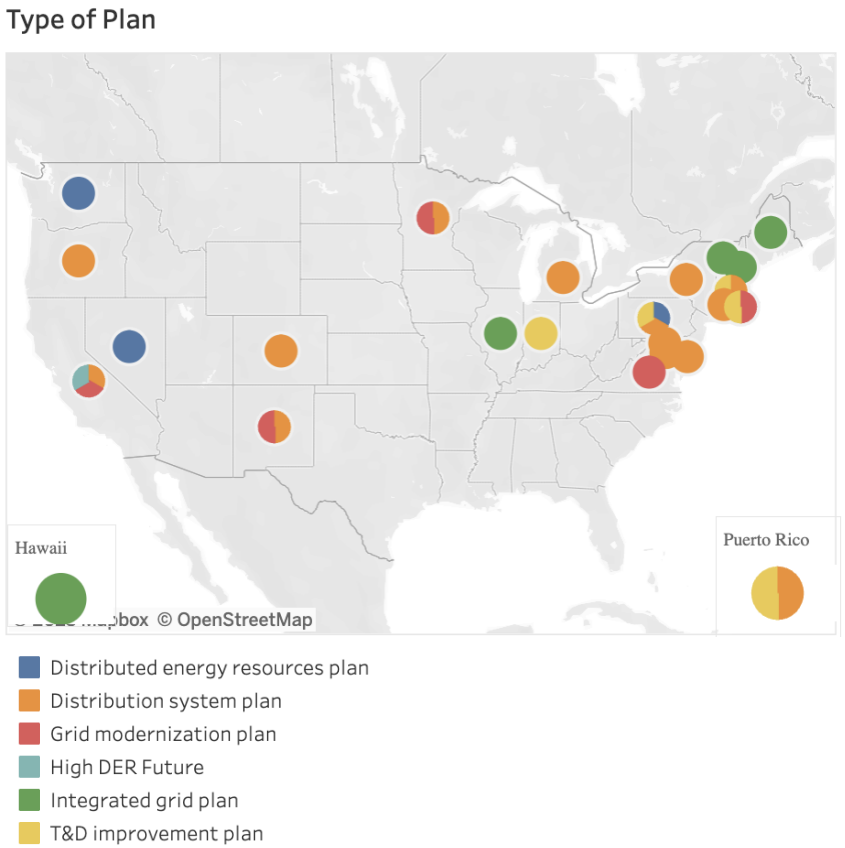


U.S. Distribution Planning Practices – Online Catalog

- Data visualization, spreadsheet, state summaries, and document library provide information on legislative and regulatory requirements for electric utilities to file some type of distribution system plan in 22 states, Puerto Rico, and DC

- Interactive interface to identify state-by-state requirements for:
  - Types of distribution plans filed
  - Filing frequency/planning horizon
  - Non-wires alternatives/hosting capacity analyses

- Detailed information by state:
  - Legislative and regulatory requirements, proceedings, and orders
  - Filed utility plans and type of regulatory action taken
  - State planning goals and objectives
  - Term of action plan
  - Stakeholder engagement



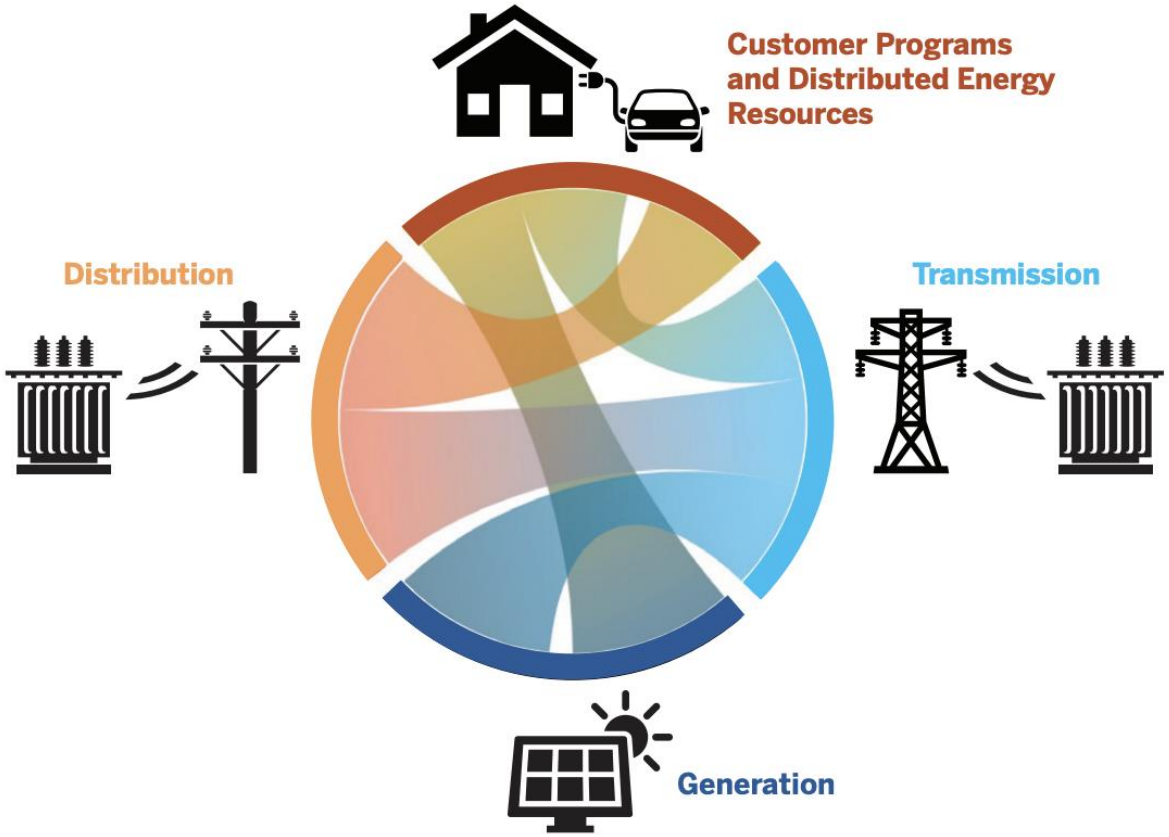
Resources for more information

- Berkeley Lab's Integrated Distribution System Planning website, including slides and recordings for previous trainings
- Online catalog of state distribution planning requirements (newly updated)
- U.S. Department of Energy (DOE) Distribution Grid Transformation website and *Modern Distribution Grid* guidebooks
- Schwartz, L., N. Mims Frick, S. Murphy, G. Pereira, G. Relf, J. Shipley, J. Schellenberg and A. Fernandez. 2024. *State Requirements for Electric Distribution System Planning*. Berkeley Lab
- De Martini, P., L. Schwartz, J. Ball. 2025. *Economic Evaluation of Modernization Expenditures for Electric Utility Distribution Systems: A Guide for Utility Regulators*. Berkeley Lab
- Murphy, S., L. Schwartz, G. Pereira, and C. Davis. 2025. *Bridging the Gap on Data and Analysis for Distribution System Planning: Information That Utilities Can Provide Regulators, State Energy Offices and Other Stakeholders*. Berkeley Lab
- Collins, M., M. Whiting, J. Schellenberg and L. Schwartz. 2025. *Bridging the Gap on Data, Metrics, and Analyses for Grid Resilience to Weather Events: Information that utilities can provide regulators, state energy offices, and other stakeholders*. Berkeley Lab
- Schellenberg, J., and L. Schwartz. 2024. *Grid Resilience Plans: State Requirements, Utility Practices, and Utility Plan Template*. Berkeley Lab
- S. Murphy, L. Schwartz, C. Reed, M. Gold and K. Verclas. 2023. *State Energy Offices' Engagement in Electric Distribution Planning to Meet State Policy Goals*. National Association of State Energy Officials
- J. Schellenberg and L. Schwartz. 2024. *Grid Resilience Planning: State Requirements, Utility Practices, and Utility Plan Template*. Berkeley Lab
- J. Carvallo and L. Schwartz. 2023. *The use of price-based demand response as a resource in electricity system planning*. Berkeley Lab
- B. Biewald, D. Glick, S. Kwok, J.P. Carvallo and L. Schwartz. 2024. *Best Practices in Integrated Resource Planning: A guide for planners developing the electricity resource mix of the future*. Synapse Energy Economics and Berkeley Lab
- J. Keen, E. Pohl, N. Mims Frick, J.P. Carvallo and L. Schwartz. 2023. *Duke Energy's Integrated System and Operations Planning: A comparative analysis of integrated planning practices*, Grid Modernization Laboratory Consortium
- Schwartz et al. 2025. Clean Air as a Bonus for Achieving Energy-Related State Goals: A Review of Policies and Programs in 15 States. Berkeley Lab
- NASEO microgrids information: https://naseo.org/topics/microgrids

Extra Slide

Other electricity plans

- **Integrated resource plan** – Optimal combination of supply- and demand-side options to meet future energy service demands in a reliable and economic manner
- **Transmission plan** – Identify future expansion needs and options for the high-voltage system
- **Integrated system plan** – Holistic approach linking traditionally siloed planning processes to develop affordable, reliable, and robust investment plans
  - Coordinated across generation, transmission, distribution, and customer resources
  - Also may consider interactions between the electric system and other energy systems (e.g., gas)
    - Puget Sound Energy Integrated System Plan



Source: Energy Systems Integration Group

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Contacts

Lisa Schwartz: lcschwartz@lbl.gov

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Distribution System Planning Fundamentals II

National Association of State Energy Officials – Distribution System Planning Training

Natalie Mims Frick

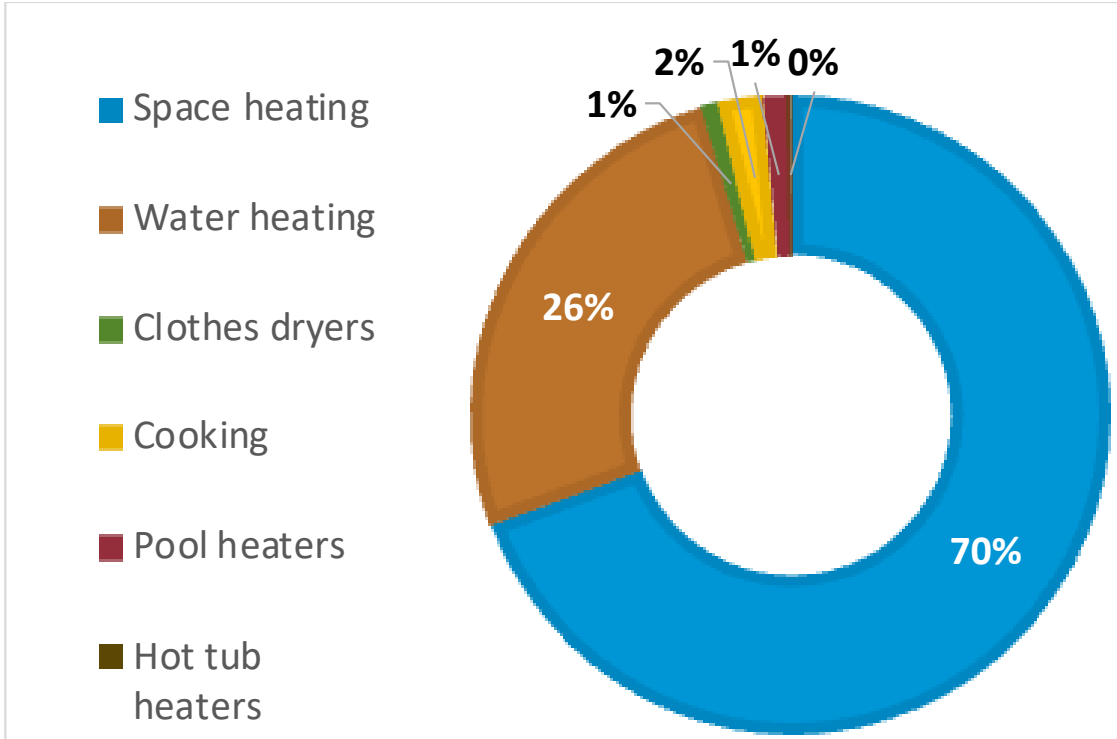
December 17, 2025

This work was funded by the U.S. Department of Energy under Contract No. DE-AC02-05CH11231.

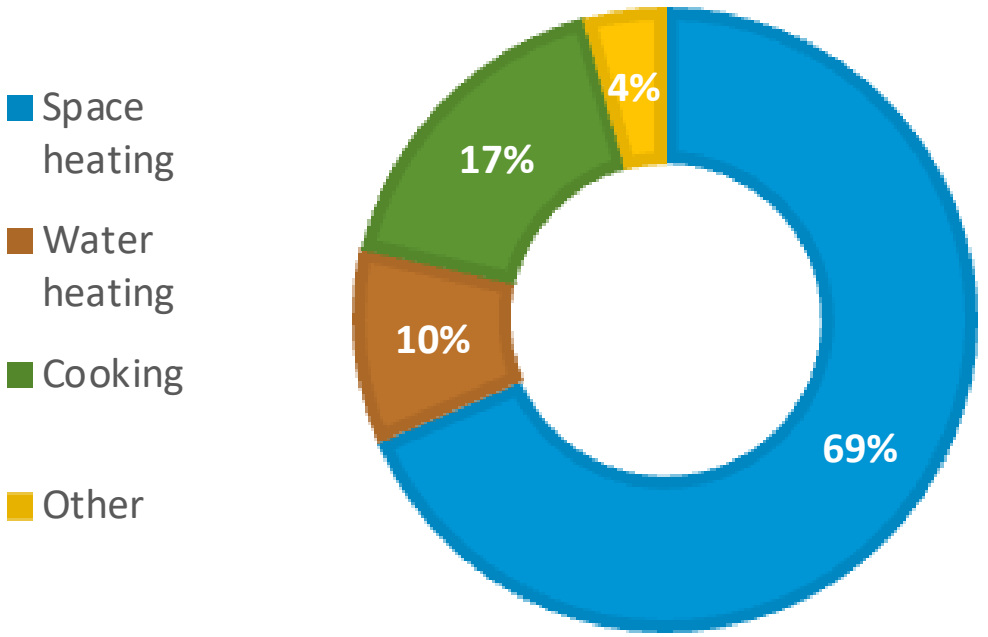
Distribution system planning for load growth from buildings

Building load growth impacts the distribution system

Residential Natural Gas Consumption by End Use, 2020 (EIA 2023)

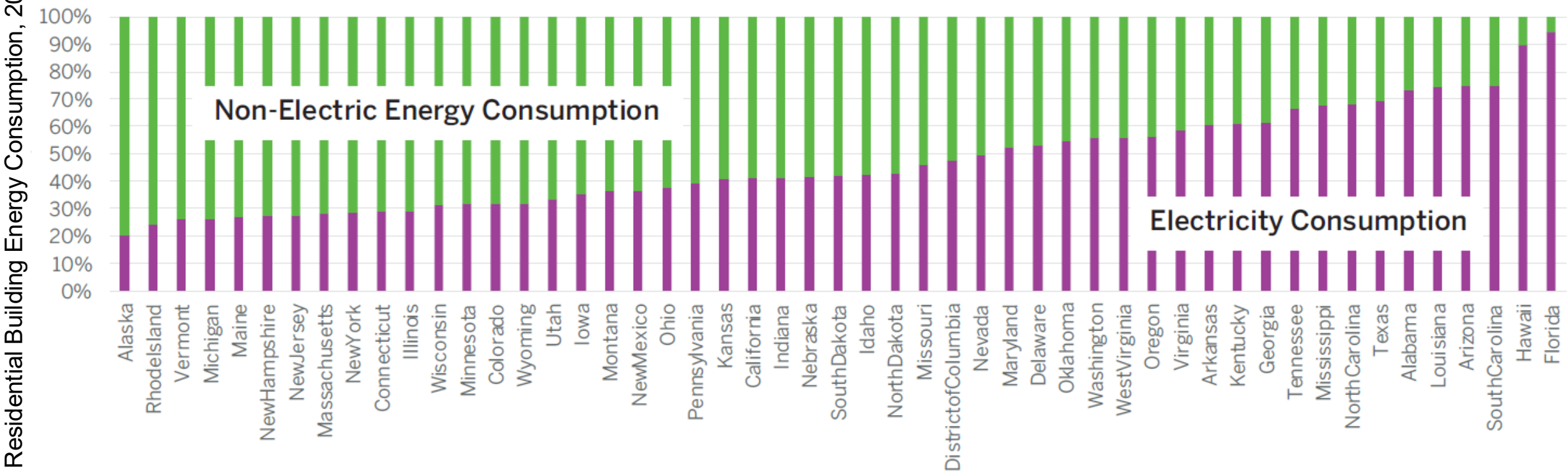


Commercial Natural Gas Consumption by End Use, 2018 (EIA 2023)



Building load growth can affect all regions

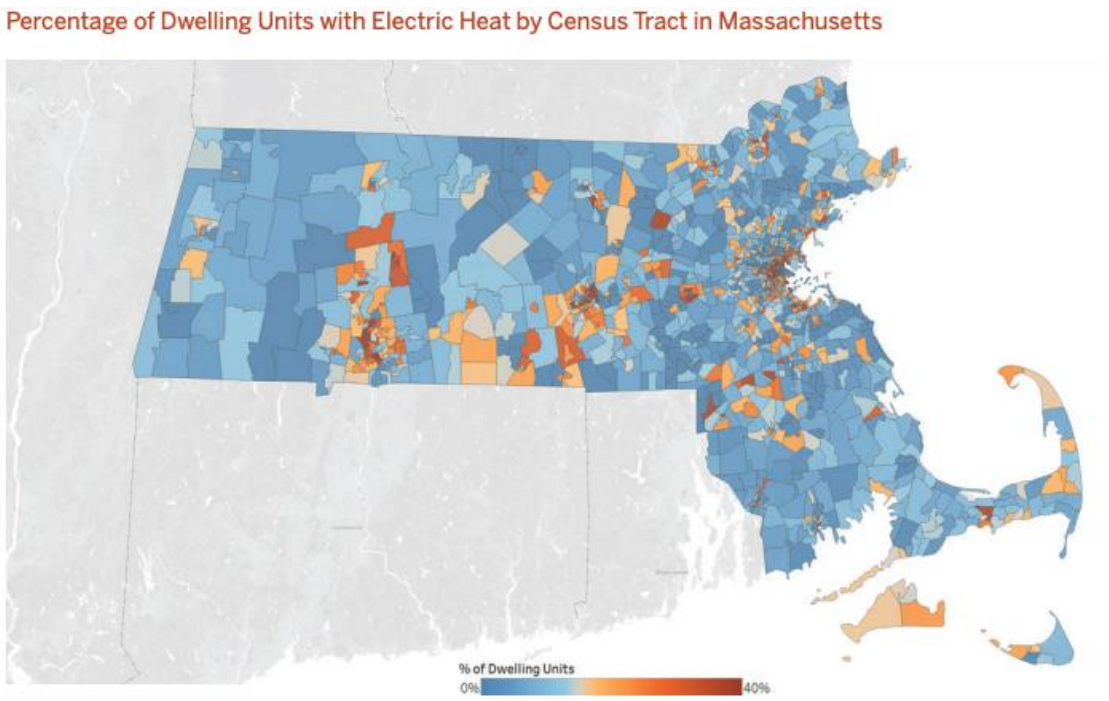
Different regions across the country are at different levels of load growth for buildings. Changing non-electric energy consumption to electricity could have significant effects on the electricity sector.



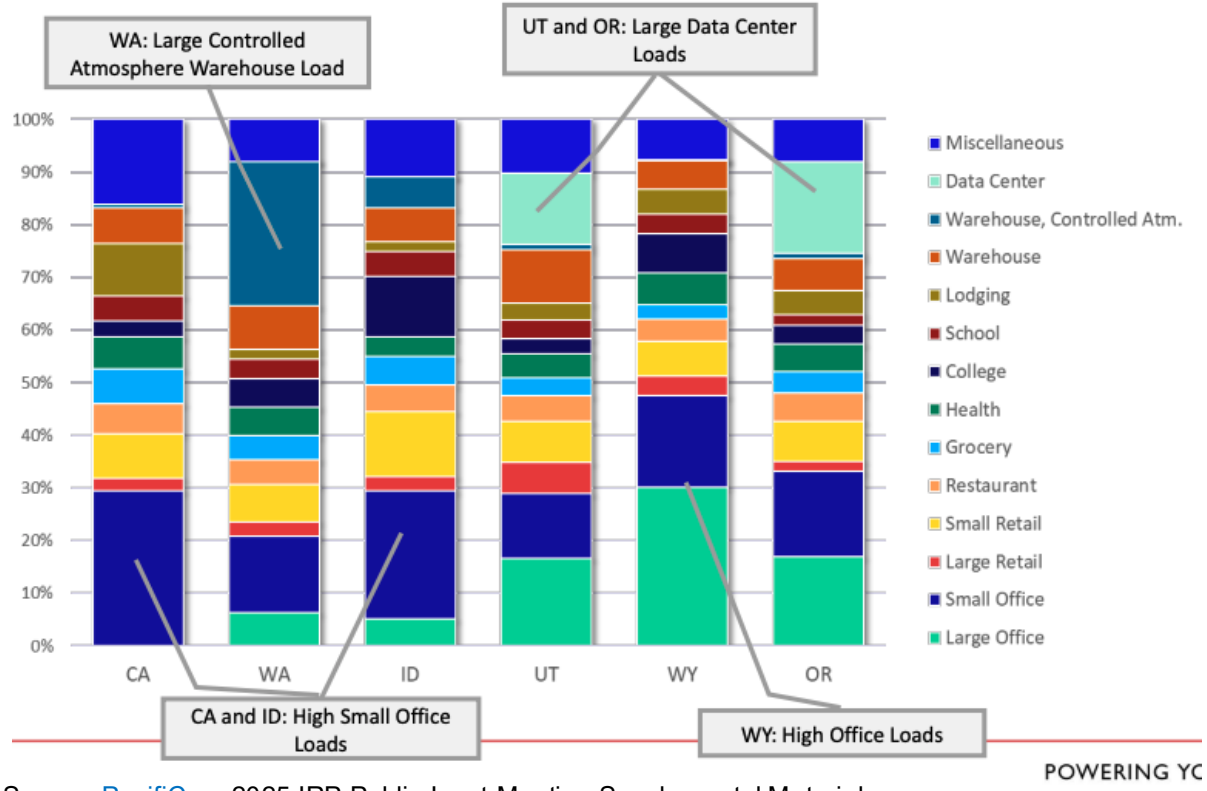
Slide credit: ESIG, Grid Planning for Building Electrication (2024)

But the impacts will not be uniform

Electricity sector impact will vary based on existing fuel for space and water heating and cooling



Source: ESIG, Grid Planning for Building Electrication (2024)

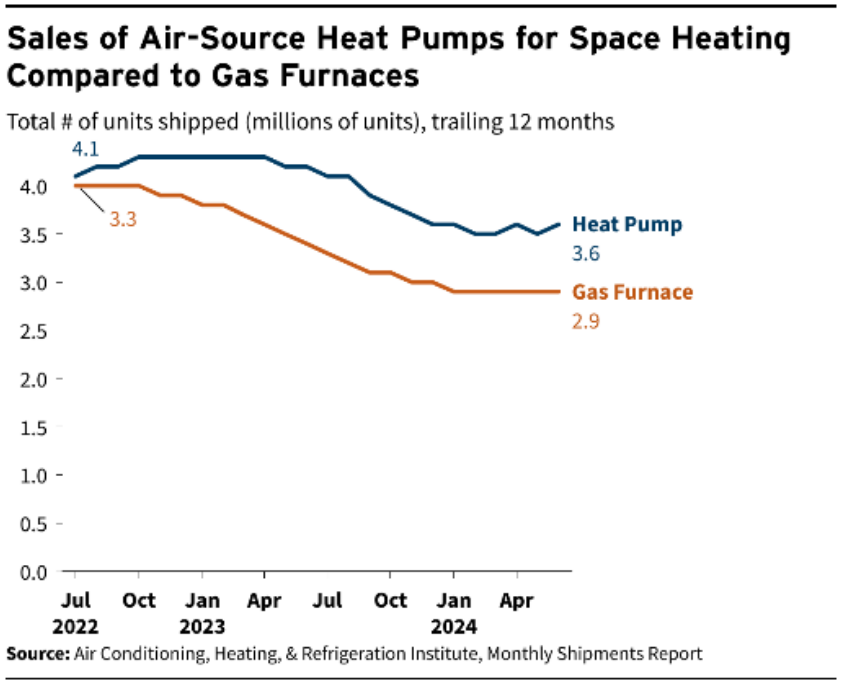


Source: PacifiCorp 2025 IRP Public Input Meeting Supplemental Materials

Impact of load growth from buildings, and opportunities for energy efficiency, will vary based on building stock

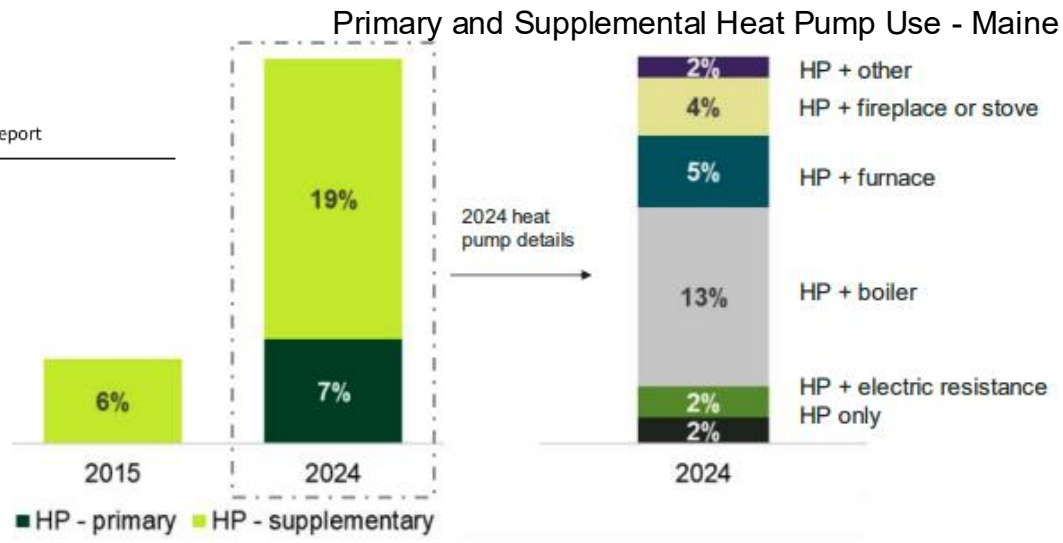
Building load growth impacts on distribution system planning - Challenges

- Changing weather patterns are hard to plan for
  - Heat pumps operate differently during extreme cold temperature
  - Longer events stress equipment and the grid



Source: RMI (2024)

- Areas with high heat pump adoption will see distribution system impacts sooner

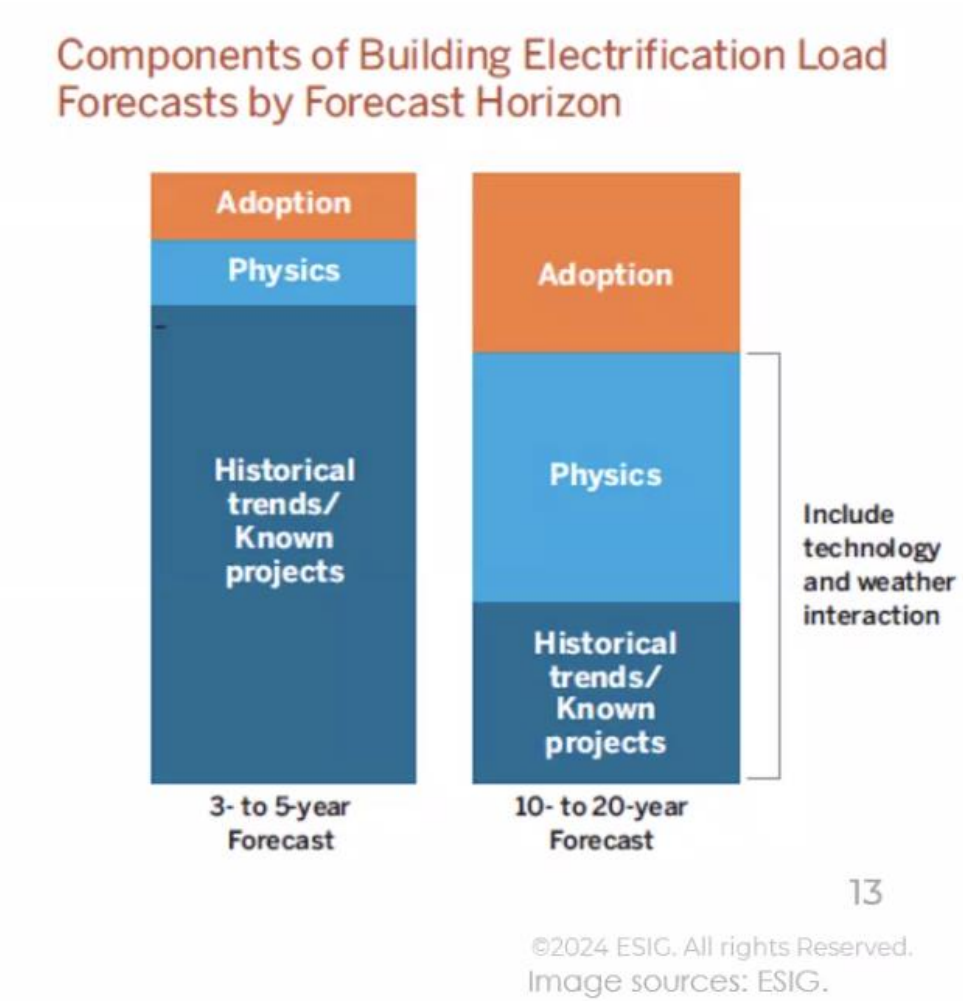


Source: Efficiency Maine (2024)

Source: ESIG, Grid Planning for Building Electrication (2024)

Building electrification impacts on distribution system planning – Solutions

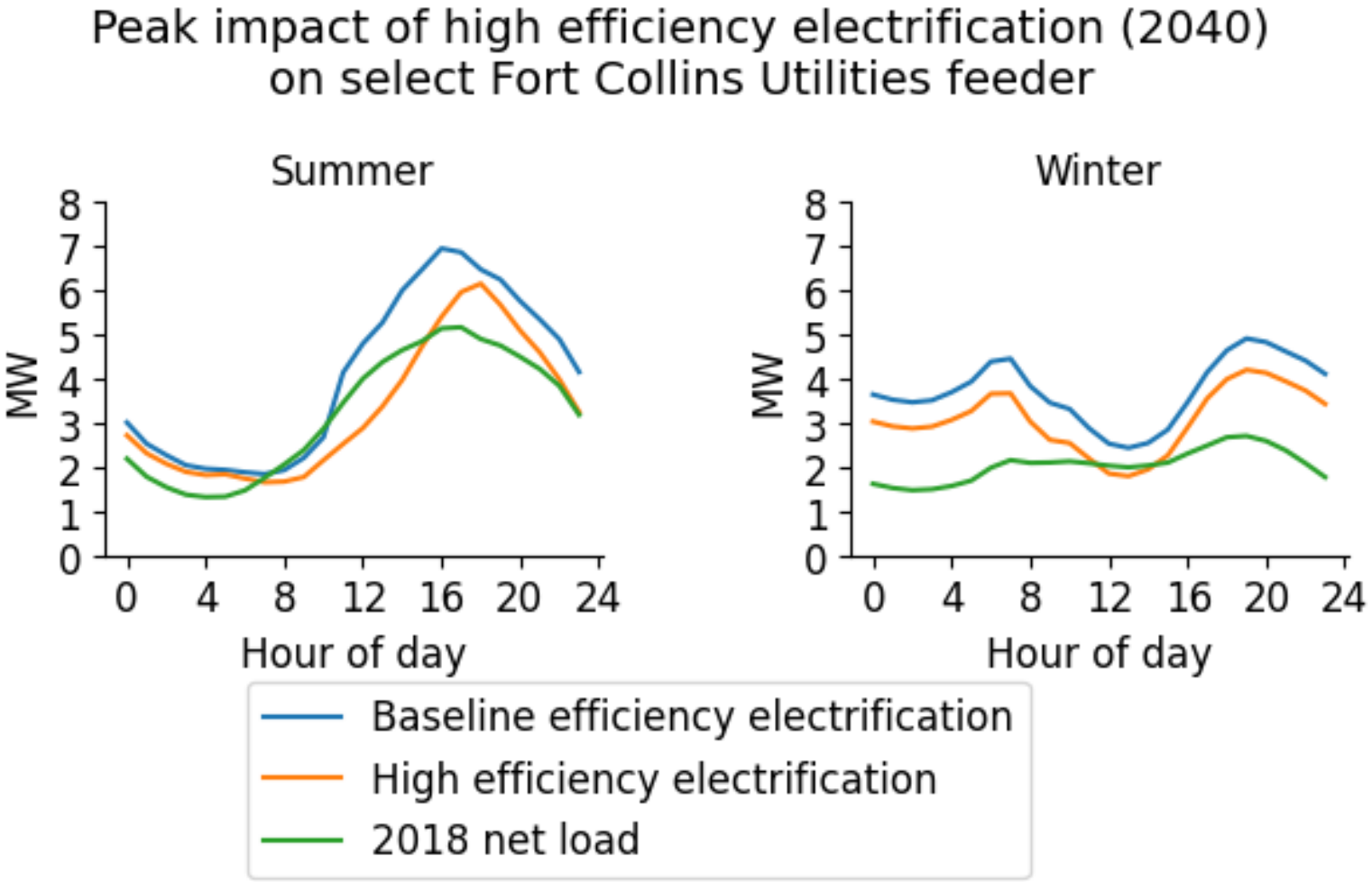
- Improve load forecasting
  - Expand the forecast horizon and broaden the factors considered
  - Consider how buildings are used to establish a clear baseline
  - Consider weather effects – the weather-sensitivity factors that historically captured building response will change with increased electricity load growth for buildings
  - Use multiple sources for forecasts to understand trade-offs, variables and key assumptions driving forecasts
- Modernize planning approach
  - Reconsider core planning assumptions, including equipment standards
  - Move beyond a singular peak hour
  - Improve reliability and resilience metrics for future
  - Share information across natural gas and electricity



Source: ESIG, Grid Planning for Building Electrication (2024)

Strategies to reduce the impact of building load growth on the distribution system

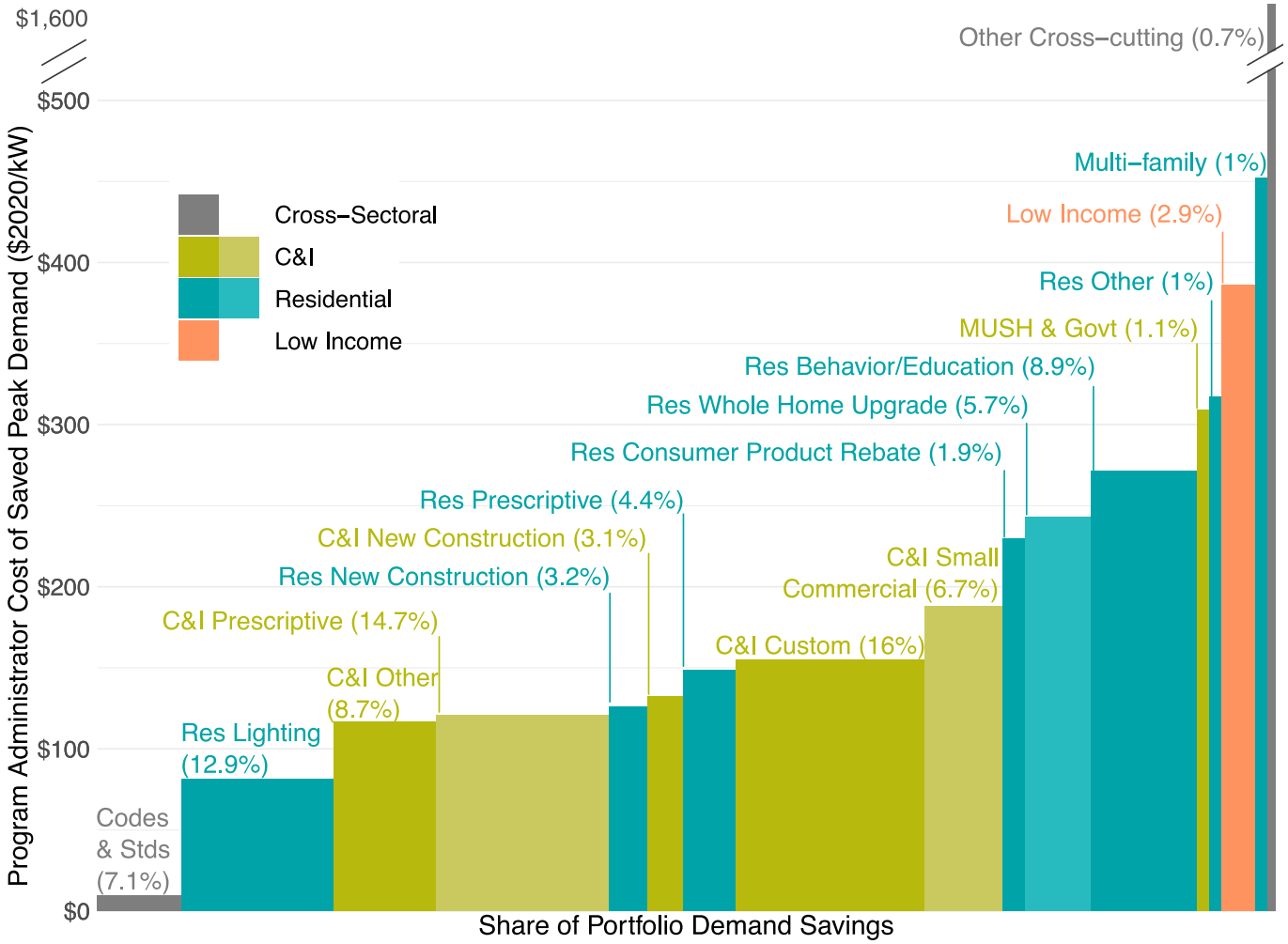
Promote *efficient* load growth in buildings



Berkeley Lab analysis for Fort Collins Utilities found efficient electrification reduced summer and winter peak demand on a representative feeder.

Source: Sean Murphy, Berkeley Lab

Design energy efficiency programs to reduce peak demand



Source: Frick et al. (2021)

- Cost of Saving Peak Demand research analyzed data on energy efficiency program savings for residential, commercial, and industrial sectors — energy and demand savings and costs.
- Analysis found that most savings are <$200/kW.

Program example: Xcel Energy geotargeted pilot

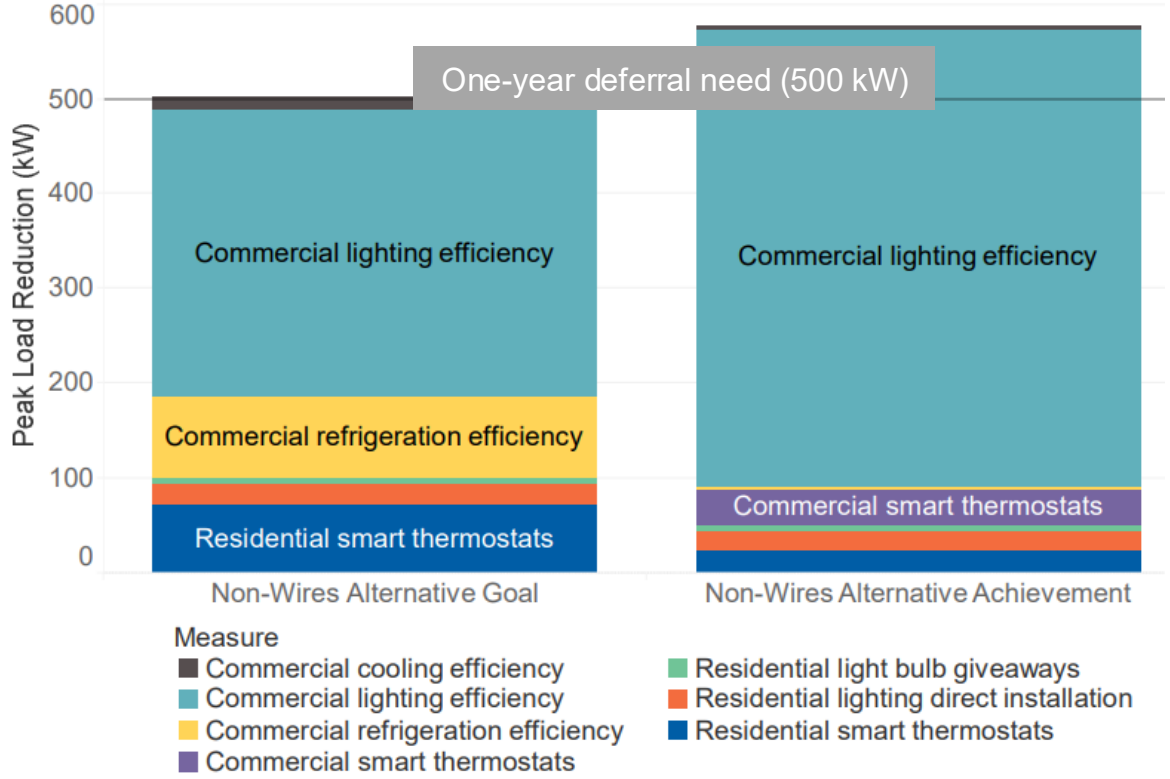
Grid need: New transformer, feeder, and feeder configuration, needed in 5 years

Solution: Targeted energy efficiency and load management to reduce peak demand by 500 kW

Goal: Defer $4.1M estimated distribution system capacity upgrades

Results: 576 kW of peak demand savings, exceeding the goal

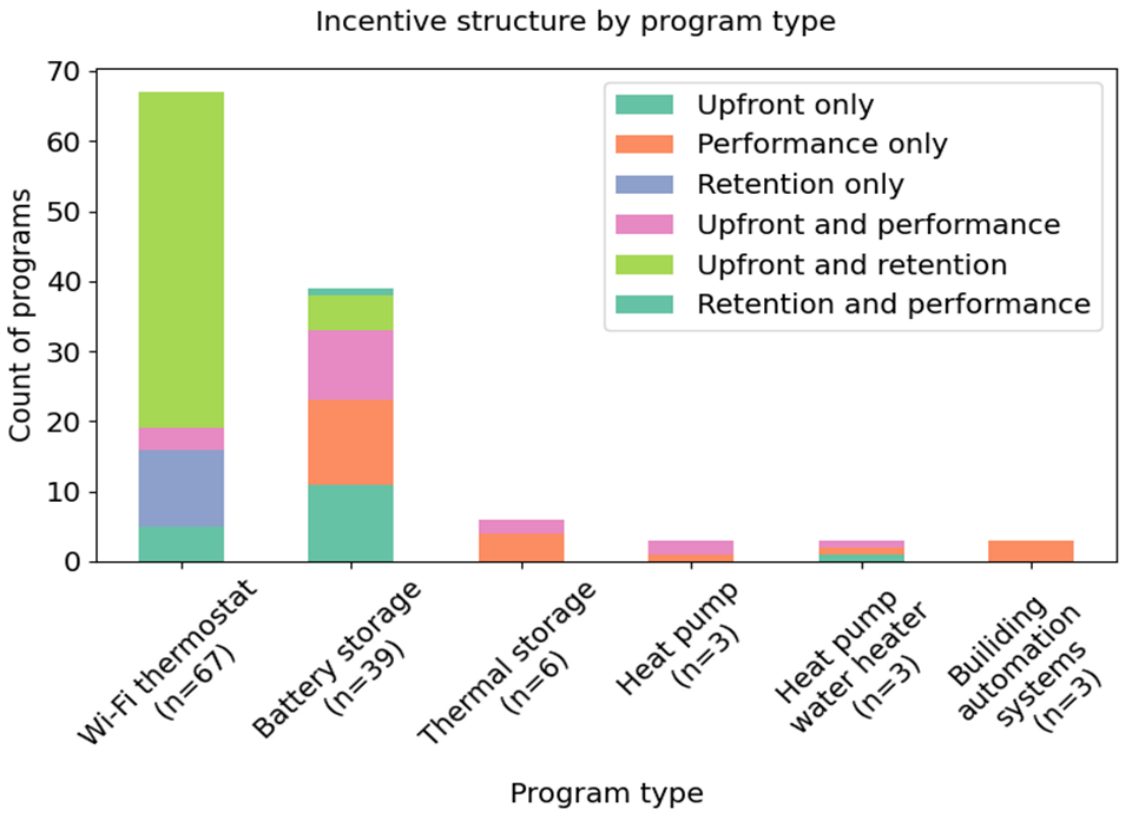
Source: Guillermo Pereira, Berkeley Lab, "Using Energy Efficiency to Help Meet Distribution System Capacity Needs," 2023 ACEEE Energy Efficiency as a Resource conference, Oct. 18, 2023

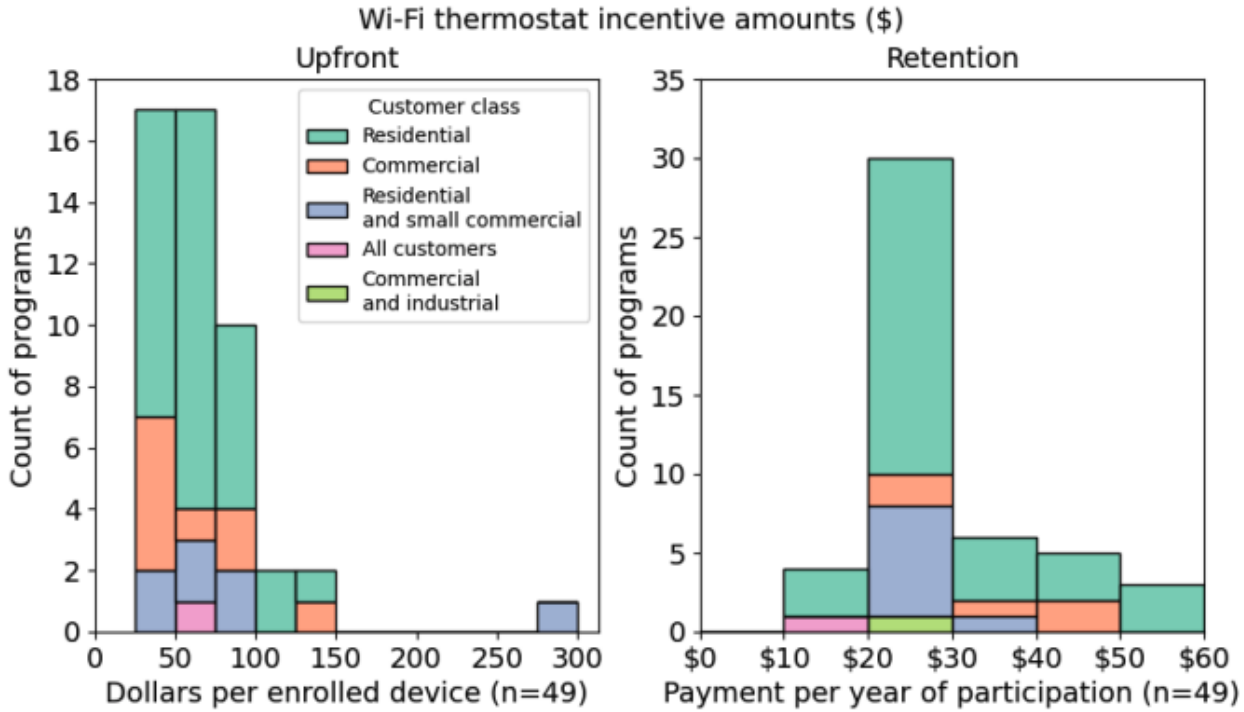


Source:
CEE 2021, Non-wires Alternatives as a Path to Local Clean Energy: Results of a Minnesota Pilot
Geotargeted Distributed Clean Energy Initiative Update Report

Incentivize demand flexibility in buildings – Program types and customer incentive levels

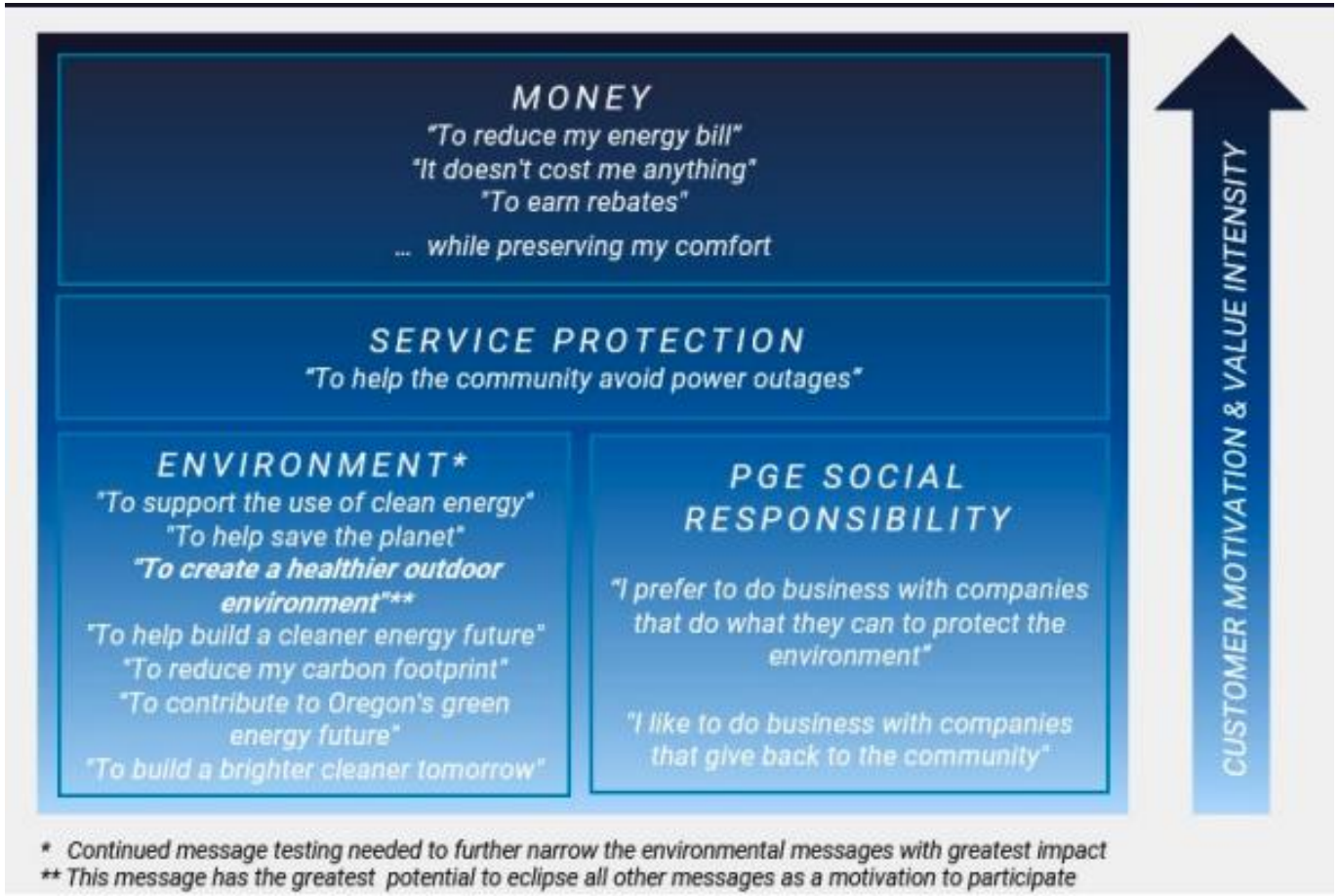
Recent Berkeley Lab research identified demand flexibility incentive structures and levels by program type.





Source: Murphy et al. (2024)

Incentivize demand flexibility in buildings - Participation



Source: PGE (2021)

Portland General Electric explored what motivated customers to participate in their demand flexibility pilot, clustered in neighborhoods around three distribution substations.

Consider front of the meter efficiency programs

- Conservation voltage reduction (CVR) is the "intentional operation of the transmission and distribution system to provide customer voltages in the lower end of the acceptable range, with the goal of achieving energy and demand reductions for customers."
- Volt-VAR optimization (VVO) occurs when utilities "manage and optimize voltage and reactive power simultaneously."
- Both of these strategies are efficiency measures that utilities can implement directly on their distribution systems.
- Common distribution system planning tools such as CYMDIST and Synergi can simulate CVR/VVO and estimate the energy efficiency savings.
- Recent measurement and verification from a CVR/VVO program in Illinois saved almost 87,000 MWh and more than 13 MW of peak demand savings in 2022.

Equipment		Grid Locations	Grid Functions
Load tap changers		Substation transformers	Adjusts feeder voltages at the substation
Voltage regulators		Distribution feeders or substations	Adjusts voltages at the substation or along the feeder
Capacitor banks		Distribution feeders or substations	Compensates for reactive power and provides voltage support

Equipment for voltage support and reactive power control
Source: DOE

Stakeholder Engagement

Stakeholder engagement: Overview

What Is It?

A collaborative approach where utilities engage communities, local governments, and stakeholders to influence the design and implementation of electric grid planning and upgrades

Who Participates?

Communities, advocacy groups, businesses, local governments

How It Works

Town halls, workshops, working groups, data portals

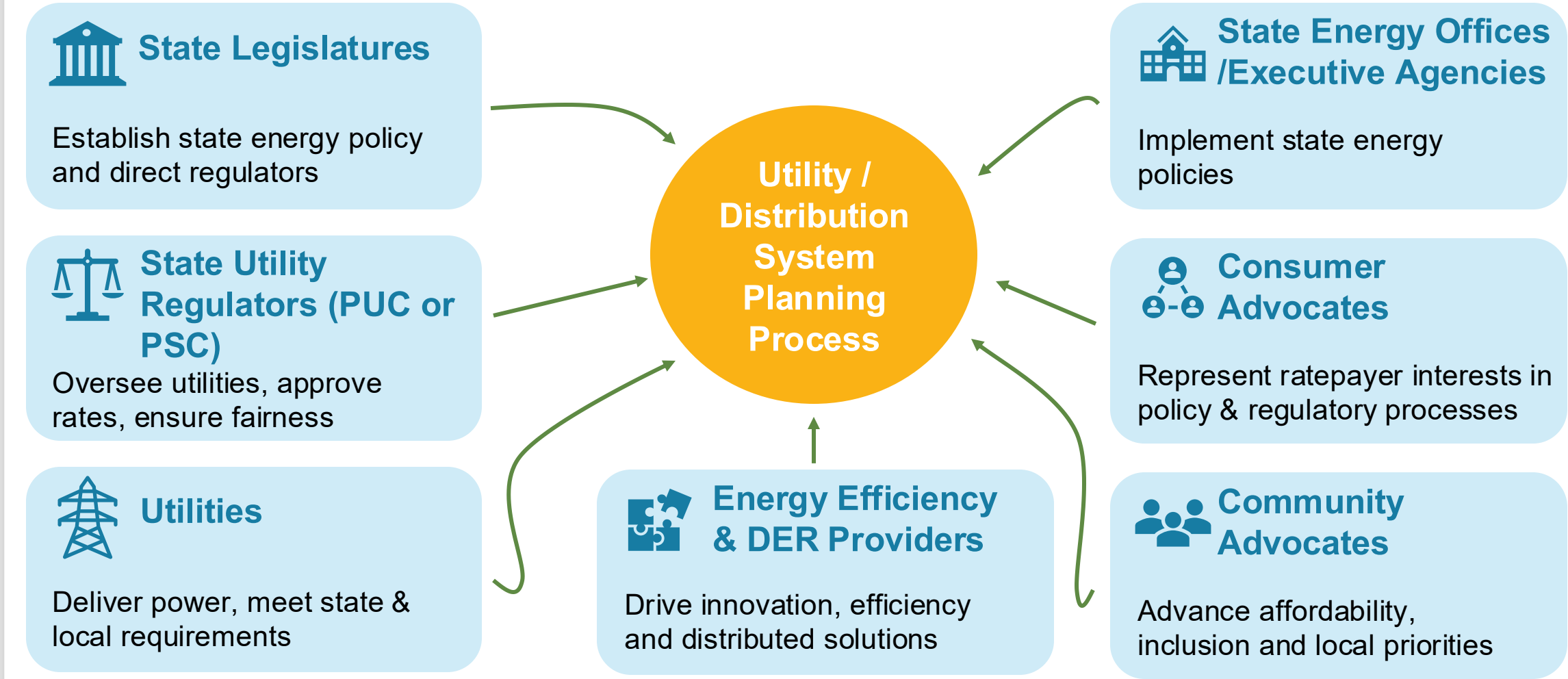
Why It Matters

Ensures plans reflect stakeholder needs and priorities

How to effectively engage in DSP

Requires starting early to build relationships, using multiple communication channels, grounding decisions in stakeholder priorities, and documenting shared learnings.

Who participates?



Why all these players matter

- ✓ No single group has all the answers
- ✓ Better decisions when diverse perspectives are included
- ✓ Utilities bring technical expertise
- ✓ Communities and stakeholders bring local knowledge and priorities
- ✓ Regulators bring public interest perspective

Result: Grid investments that work for **everyone**

States with DSP stakeholder engagement requirements (1/2)

13 states include provisions for DSP stakeholder engagement:

CA | CO | HI | IL | MA | ME | MI

MN* | NV | NY | OR | WA | MD

Key Finding: The majority of states require utilities to share information with stakeholders and gather feedback **before filing the distribution system plan.**

*Minnesota reference is Order in Docket 18-251, August 30, 2018, available in Minnesota eDockets).

States with DSP stakeholder engagement requirements (2/2)

Examples of stakeholder requirements that states may adopt

MINIMUM MEETINGS

Specify the minimum number of stakeholder meetings utilities must hold before plan filing.

States: CO, IL, MA, MN, OR

REQUIRED TOPICS

Require that certain topics be discussed at stakeholder meetings.

States: CO, IL, MN

WORKING GROUPS

Establish formal working groups to provide structured, ongoing stakeholder participation in DSP development.

States: DC, HI, WA

WORKSHOPS

Voluntarily host informational workshops as part of the distribution system planning process.

States: MI, OR

How it works

DSPs often require stakeholder engagement to ensure transparency and participation

- These processes invite local governments and communities to participate in regulatory processes.
- They **emphasize two-way information sharing** — utilities share data and plans, while stakeholders share insights, priorities, and feedback to shape outcomes.

Engagement approaches range from informal to formal

- **Informal forums**: dedicated working groups, town hall meetings, webinars, or in-person workshops
- **Formal structures**: institutionalized stakeholder collaborative groups, externally organized working groups, and data sharing portals

DSP stages & when to engage

Stakeholder engagement can occur at various stages of the DSP through informal and formal channels

PRIOR TO DSP FILINGS

Example: NY PSC — Required utilities to file a plan and timeline for stakeholder engagement

AFTER DSP FILING

Example: California PUC — Established the Distribution Planning Advisory Group to advise utilities on selection of distribution deferral opportunities and provide input on development of competitive solicitations for DERs to meet those needs

FUTURE DSPS

Example: Nevada PUC and Michigan PSC — Required collaboration on technical processes such as locational net benefits and non-wires alternatives analysis

Continued improvement and reporting

- Across 6+ states, utilities must report on stakeholder engagement in filed plans
- Regulators increasingly require documented processes, feedback, and outcomes

Colorado
Describe stakeholder engagement process in filings

Illinois
Third-party report on stakeholders, discussions & consensus

Minnesota
Detailed stakeholder process summaries and collaboration requirements

New York
Include engagement info in topical sections of IDSP

Rhode Island
Include meeting minutes in least-cost procurement filings

Massachusetts
Metrics, equity goals, and stakeholder advisory inclusion

See Appendix J for more details

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Contacts

Natalie Mims Frick: nfrick@lbl.gov

For more information

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