

Integrated Distribution Planning: State Energy Office Engagement and Technical Assistance Resources

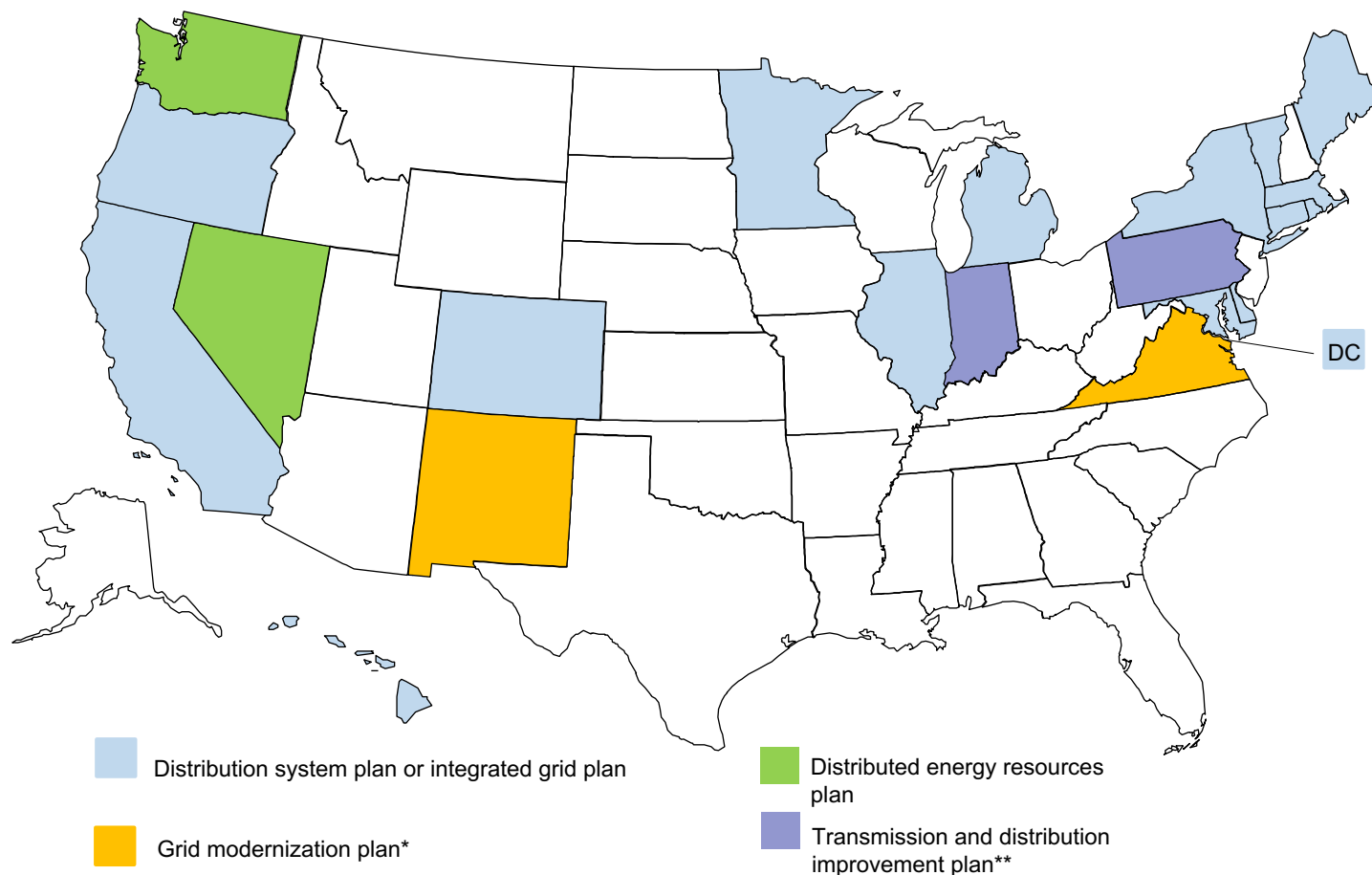
National Association of State Energy Officials Energy Policy Outlook Conference
Distribution and Integrated Resource Planning: Support for and Examples from States
February 7, 2024

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Prepared with Lisa Schwartz

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About 20 states require regulated utilities to file some type of distribution plan



*Some states that require distribution system plans also require grid modernization plans (e.g., Minnesota and California).

**Indiana also includes storage.

Source: [State Energy Offices' Engagement in Electric Distribution Planning to Meet State Policy Goals](#)

Types of distribution plans filed (1)

Distribution system improvement plans

Enables expedited cost recovery for certain system improvements

- [Indiana's Transmission, Distribution, and Storage System Improvement Charge](#) can include new or replacement transmission, distribution, or utility storage projects for safety, reliability, system modernization, or economic development.
- [Pennsylvania's Distribution System Improvement Charge](#) can be used to recover costs to repair, improve, or replace eligible distribution property.

Distributed energy resources (DERs) plan

Evaluates benefits and costs of DERs, considers ways to increase deployment of cost-effective DERs, and facilitates better integration of DERs in distribution planning

- Regulated utilities in Nevada must submit a [Distributed Resource Plan](#) to the Public Utilities Commission every three years as part of their integrated resource plan.
 - Evaluate locational benefits and costs of DERs, including distributed generation systems, energy efficiency, energy storage, electric vehicles (EVs), and demand response technologies
 - DER forecasting and hosting capacity analysis that inform grid needs assessment
 - Propose infrastructure upgrades and non-wires alternatives for identified grid constraints



Types of distribution plans filed (2)

Grid modernization plan

Reasoned strategy linking technology deployment roadmap to stated objectives

- Examples: CA, MA, MN, NM, RI, VA
- A primary focus today is replacing aging infrastructure with advanced grid technologies.
- Plans may include a request for approval of grid modernization investments and programs, with expedited cost recovery.

Integrated distribution system plan (IDSP)

Systematic approach to satisfy customer service expectations and state objectives

- Includes grid mod strategy and DER planning
- May coordinate across planning domains (e.g., [HECO's 2023 Integrated Grid Plan](#), [Maine Integrated Grid Plan statute](#))



Source: EPRI



Examples of State Energy Offices supporting distribution planning (1)

□ Analyses that inform IDSP

- Massachusetts Department of Energy Resources commissioned a [Technical Potential of Solar Study](#) to inform PV development
- New Mexico Energy Conservation and Management Division of the Energy, Minerals, and Natural Resources Department (EMNRD) developed a [Baseline Report of New Mexico's Electricity System](#) and a [Grid Modernization Roadmap](#)

□ Stakeholder engagement

- [Massachusetts' Grid Modernization Advisory Council](#) reviews draft electric-sector modernization plans filed by electric distribution companies and provides recommendations for final plans to be reviewed by the utility regulator
- Hawaii State Energy Office's [Energize Kakou](#) initiative shared information and gathered input to empower community participation in the clean energy transition
- New Mexico EMNRD hosted a [Grid Modernization Advisory Group](#) to inform the state's grid modernization roadmap
- Rhode Island Office of Energy Resources is collaborating with the town of Johnston, the utility, and local stakeholders to improve local information for grid planning. The State Energy Office also participates in the utility's [Power Sector Transformation](#) Advisory Group.



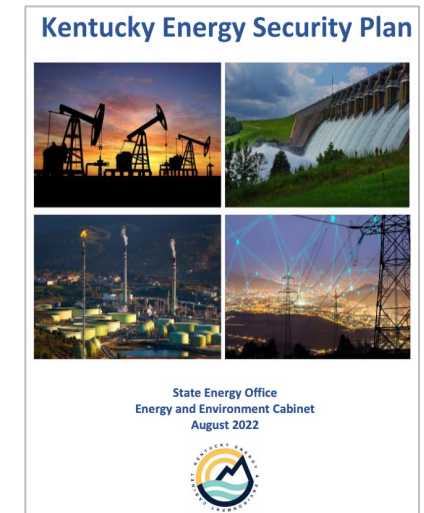
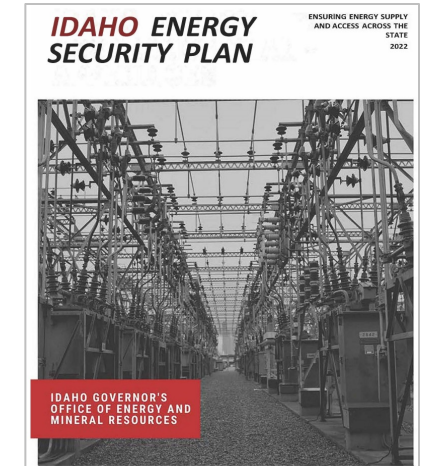
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See [State Energy Offices' Engagement in Electric Distribution Planning to Meet State Policy Goals](#)

Examples of State Energy Offices supporting distribution planning (2)

□ State Energy Security Plans (IIJA)

- Assess existing circumstances and propose methods to strengthen the state's ability to:
 - Secure energy infrastructure against all physical and cybersecurity threats
 - Mitigate the risk of energy supply disruptions
 - Enhance the response to, and recovery from, energy disruptions
 - Ensure that the state has reliable, secure, and resilient energy infrastructure
- Resilience-related requirements include:
 - Addressing physical and cybersecurity threats and vulnerabilities
 - Providing a risk assessment of energy infrastructure and cross-sector interdependencies
 - Developing a risk mitigation approach to enhance reliability and end-use resilience
- State Energy Security Plans are the foundation of grid investment resilience planning under the IIJA. They highlight resilience risks, discuss investment priorities for enhancing the grid, and provide insights into potential priority investments by utilities.
- Utility resilience plans — ideally, as part of integrated distribution planning — should align with methods, data sources and priorities in the State Energy Security Plan.



Examples of State Energy Offices supporting distribution planning (3)

- **Other state plans** — e.g., [comprehensive state energy plans](#), climate change plans and more:
 - [2021 Washington State Energy Strategy](#) – Recommendations include smart and flexible grids, better valuation of DERs, and improved capacity of distribution systems to host DERs
 - [2019 North Carolina Clean Energy Plan](#) – Recommendations support grid modernization for clean energy resource adoption and grid resiliency and flexibility
 - [2019 New Jersey Energy Master Plan](#) – Includes a requirement to develop integrated DER plans to identify the need for distribution system upgrades that enable growth of DERs and electric vehicles
 - New York State Energy Research and Development Authority’s [Transportation Electrification Distribution System Impact Study](#) – Assessed load and cost impacts and needed distribution upgrades under various electrification scenarios
- **Administration of grant programs**
 - IIJA 40101(d) grant funds and Grid Resilience and Innovation Partnerships Program
 - State programs
 - New Mexico EMNRD administers a [Grid Modernization Grant Fund](#) for municipalities, universities, state agencies, and hospitals
 - Colorado Energy Office supports the [Microgrids for Community Resilience Grant Program](#)
- **Participation in regulatory proceedings**
 - Expertise State Energy Offices can contribute includes planning goals and objectives, inputs and methodologies for load and DER forecasting, reliability and resilience, electricity affordability, and analysis of non-wires alternatives
 - Example State Energy Offices: Colorado, Connecticut, Minnesota and Rhode Island



Technical assistance for State Energy Offices (1)

NASEO/NARUC/LBNL training on distribution system and resilience planning in Nashville, March 20-21

Register [HERE](https://www.naseo.org/event?EventID=8723)

<https://www.naseo.org/event?EventID=8723>

Limited travel stipends available — contact Catherine Reed (creed@naseo.org) or Blake Kinney (binney@naseo.org)

Regional Training on Distribution System Planning and Resilience

NASEO, NARUC, and LBNL invite State Energy Offices, public utility commissions, and utility consumer advocates to participate in regional training on distribution system planning and resilience.

Training Sessions

Nashville, TN | Open to NARUC, NASEO, and NASUCA members

- **March 20, 2024:** Integrated Distribution System Planning
- **March 21, 2024:** Resilience Planning

Register Now

Note: Limited travel stipends are available upon request. This is a repeated training with similar content as the regional distribution system planning and resilience trainings that took place in November 2023 and January 2024.



Technical assistance for State Energy Offices (2)

- **Distribution system planning** – e.g., Technical memo for Governor’s Energy Office of Maine identifying ways State Energy Offices engage in distribution planning-related processes
Contact: Lisa Schwartz, lcschwartz@lbl.gov
- **Energy efficiency financing** – e.g., State Energy Office bootcamp, webinars, case studies on successful programs, *pro forma* financial tool, and direct state assistance for BIL revolving loan funds
Contacts: Greg Leventis, GLEventis@lbl.gov; Jeff Deason, JADeason@lbl.gov
- **Energy savings performance contracting** – e.g., Measurement & verification guides, webinars on target markets (e.g., municipal, university, K-12), data tracking tools and best practices
Contact: Liz Stuart, ESTuart@lbl.gov
- **National Community Solar Partnership** – e.g., Reviewed District of Columbia Department of Energy & Environment’s “Scenario Selector” workbook, used to forecast Alternative Compliance Payments and Solar Renewable Energy Credit revenues
Contact: Greg Leventis, GLEventis@lbl.gov

Other technical assistance programs

- **Resources and Support for State Energy Offices & Regulators (RASOR)** – *Pete Cappers, pacappers@lbl.gov*
- **DERs and Virtual Power Plants** – *Natalie Mims Frick, nfrick@lbl.gov*
- **Low-to-Moderate Income Solar Institutional Support** – *Galen Barbose, gbarbose@lbl.gov*

Online Catalog: State Distribution Planning Requirements

State	Type of Plan	State Legislation	Commission Orders on Filed Plans	Frequency of Filing (years)	Planning Horizon (years)	Stakeholder Engagement	Equity
Illinois	Integrated grid plan	SB 2408 (2021 - Public Act 102-0662)	Dec. 14, 2023, order rejected ComEd IGP: Dec. 14, 2023, order rejected Ameren IGP	4	5	Minimum 5-month stakeholder process for each utility with independent facilitator and workshops that: 1) review planned capital investments, 2) review data on reliability, resiliency, service quality, and DERs 3) request input from diverse set of stakeholders (specifies several types), 4) discuss proposals from utilities and stakeholders to achieve goals, and 5) educate participants. Intended to be accessible (no legal representation required) and solicit feedback.	Illinois' Climate and Equitable Jobs Act (SB 2408, 2021) includes equity among the goals for Multi-Year Integrated Grid Plans. CEJA requires IGPs to plan to bring 40% of the benefits from programs, policies, and initiatives proposed in the plan to ratepayers in low-income and environmental justice communities.

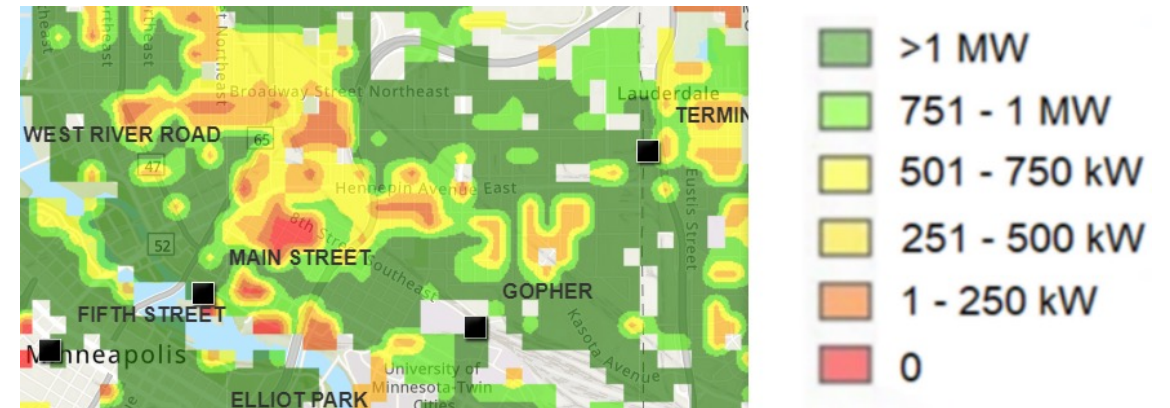
Detailed state-by-state table, interactive maps, and document library

- ▣ Planning goals and objectives
- ▣ State legislation
- ▣ Regulatory commission rules or guidance
- ▣ Type of plan filed
- ▣ Filed utility plans and commission orders
- ▣ Commission proceedings
- ▣ Frequency of filing
- ▣ Planning horizon
- ▣ Stakeholder engagement requirements
- ▣ Equity provisions
- ▣ Type of commission action on plan filing
- ▣ Non-wires alternatives analysis
- ▣ Hosting capacity analysis

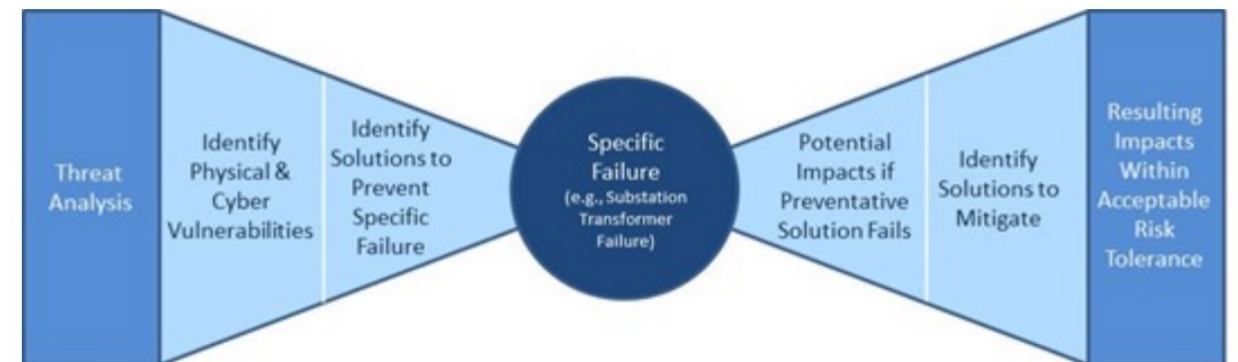
Available on Berkeley Lab's integrated distribution system planning [website](#) later this month

Report: *State Requirements for Electric Distribution System Planning*

- State goals and objectives
- Procedural requirements
- Forecasting loads and DERs
- Hosting capacity analysis
- Baseline information requirements
- Grid modernization strategy
- Grid needs assessment
- Non-wires solutions
- Reliability and resilience analysis
- Stakeholder engagement
- Equity
- Pilots
- Coordination with other planning processes



Xcel Energy Minnesota [Hosting Capacity Map](#)



De Martini et al. 2022. [Integrated Resilient Distribution Planning](#)

Available on Berkeley Lab's integrated distribution system planning [website](#) later this year

Framework and standardized template for utility resilience plans

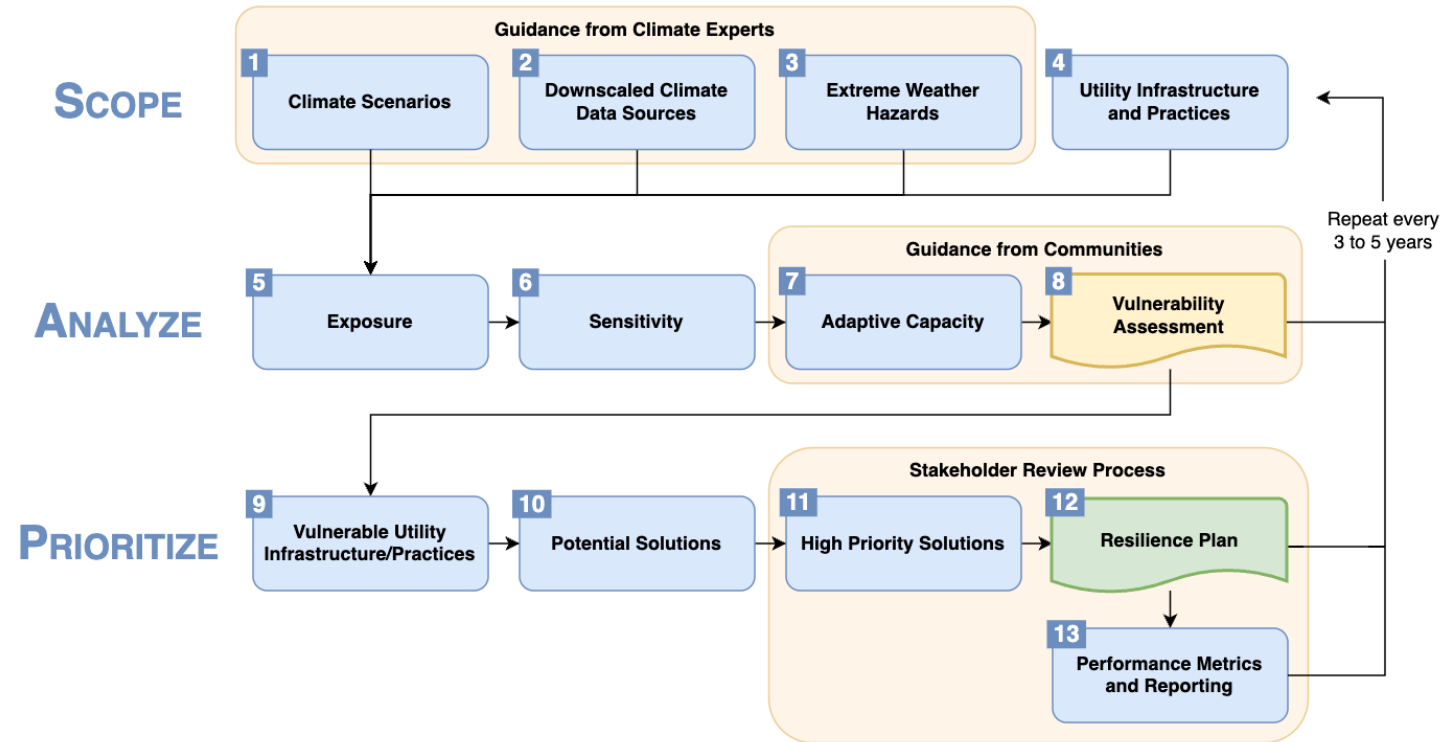
Objectives

- Facilitate development of plan requirements
- Assist with review of prepared plans
- Use a standard format for ease of review

States can adapt the template based on:

- State goals
- Definitions for key terms
- Hazards, assets and practices in scope
- Downscaled climate data for specific hazards
- Most viable resilience measures
- Performance metrics and benchmarks
- Equity considerations and third-party review and engagement
- Alignment with other plans — e.g., state energy security plans, T&D plans, emergency response

Resilience Planning Framework for Extreme Weather



See Extra Slides for more information

Resources for More Information

Berkeley Lab's Integrated Distribution System Planning [website](#), including slides and recordings for distribution planning trainings

S. Murphy, L. Schwartz, C. Reed, M. Gold, and K. Verclas, [State Energy Offices' Engagement in Electric Distribution Planning to Meet State Policy Goals](#), National Association of State Energy Officials, 2023

U.S. Department of Energy, [Modern Distribution Grid](#) guidebooks

J. Carvallo and L. Schwartz, [The use of price-based demand response as a resource in electricity system planning](#), Berkeley Lab, 2023

J. Keen, E. Pohl, N. Mims Frick, J.P. Carvallo and L. Schwartz, [Duke Energy's Integrated System and Operations Planning: A comparative analysis of integrated planning practices](#), Grid Modernization Laboratory Consortium, 2023

Berkeley Lab, Pacific Northwest National Lab and NARUC, [Peer-Sharing Webinars](#) for Public Utility Commissions on Integrated Distribution System Planning, 2023

N. Frick, S. Price, L. Schwartz, N. Hanus and B. Shapiro, [Locational Value of Distributed Energy Resources](#), Berkeley Lab, 2021



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Extra Slides



Framework and standardized template for utility resilience plans

Executive summary

- Resilience plan objectives and motivation
- Definitions of key terms
- Measures considered in plan development
- Proposed resilience programs
- Summary of overall costs and benefits by resilience program
- Summary of metrics the utility will use to evaluate the plan's performance
- Describe how the utility's resilience plan aligns with the State's Energy Security Plan
- Status of state and federal resilience funding support
- How the overall resilience plan is in the public interest

Vulnerability assessment and prioritization approach

- Description of service area
- History of extreme weather events in service territory
- Summary of approach for forecasting frequency and severity of extreme weather events
- Practices and infrastructure prioritized for enhancement, including a matrix that summarizes all hazards relative to assets and practices, analyzed with a clearly defined vulnerability rating
- Summary of third-party review/engagement



Framework and standardized template for utility resilience plans

Description of each resilience program

- ❑ Time period (actual or estimated start and completion dates)
- ❑ Expected improvement to utility’s existing infrastructure and practices
- ❑ Estimate of the resulting benefits
- ❑ How resilience program impacts prevention of, response to, and recovery from major outage events
- ❑ Program performance metrics
- ❑ Cost estimate including capital and operating and maintenance expenses
- ❑ Comparison of costs and benefits for the proposed resilience program
- ❑ Description of criteria used to select and prioritize the proposed program

Projected rate impacts

- ❑ Estimated number and costs of projects under each program
- ❑ Relevant cost drivers for each program
- ❑ Est. annual revenue requirements by year
- ❑ Est. rate impacts by year
- ❑ Est. rate impacts by customer class
- ❑ Implementation alternatives considered

Year	Resilience Plan Annual Revenue Requirement (\$ millions)
2024	
2025	
2026	
2027	
2028	
2029	
...	

Customer Class	Resilience Plan Estimated 3-year Rate Impacts		
	2024	2025	2026
Residential (\$/kWh)			
Commercial (\$/kW or \$/kWh)			
Industrial (\$/kW or \$/kWh)			

