Energy Markets & Planning
BERKELEY LAB

Distribution System Plan Template for Electric Utilities

For Adaptation by States and Utilities

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June 2026

This work was supported by the U.S. Department of Energy, Office of Electricity, under Lawrence Berkeley National Laboratory Contract No. DE-AC02-05CH11231.

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June 2026

See accompanying guide for this template

Acknowledgments

The work described in this study was conducted at Lawrence Berkeley National Laboratory (LBNL) and supported by the U.S. Department of Energy's (DOE's) Office of Electricity under Contract No. DE-AC02-05CH11231.

The authors thank the following individuals for reviewing all or portions of this report (affiliations do not imply that these organizations support or endorse this work):

Aboubakr Abdallah, Oregon Public Utility Commission

Matt Alvarado, Iowa Utilities Commission

Tayler Becker, Michigan Public Service Commission

Heide Caswell, Oregon Public Utility Commission

Cody Davis, Electric Power Engineers

Julia Fox, Massachusetts Department of Energy Resources

Bridgette Frazier, Arkansas Public Service Commission

Joel Porter, North Carolina Department of Environmental Quality

Anna Schiller, Michigan Public Service Commission

Quinn Weber, Washington Utilities and Transportation Commission

De Andre Wilson, Maryland Public Service Commission

	Primary Type of Information
1. Executive summary	
Overview of plan structure and content[1]	Narrative
Synopsis of past and planned actions to achieve the utility's long-term vision, including key differences between its previous plan and the current filing, rationale, and impacts on planning outcomes	Narrative
Links to previous plans and implementation progress reports, if applicable	Narrative
List of planning objectives (e.g., reliability, safety, resilience, affordability) with a brief description of their relevance for the utility's service territory	Narrative
Summary of anticipated system evolution through the planning horizon	Narrative
Summary of proposed capital and operation & maintenance (O&M) expenditures by year for the planning period, including identification of major cost drivers	Data
2. Planning objectives: Grid vision and strategy	
Utility's long-term vision for the distribution system (e.g., guiding principles and key considerations), emphasizing key capabilities, functionalities, and technologies	Narrative
Regulatory, technology, and market drivers and impacts on grid vision and strategy	Narrative
Planned evolution from the current state of the distribution system to achieve the long-term desired state, including key milestones, and measurable progress indicators	Narrative
2. Planning objectives: Compliance with state requirements and priorities	
Summary of applicable state objectives, statutory and regulatory requirements, and priorities	Narrative
Description of how the plan addresses the objectives, requirements, and priorities and identification of any areas that may benefit from future regulatory clarification or guidance	Narrative
Identification of any aspects where the filed plan is not compliant, including rationale	Narrative
3. Current distribution system	
Summary of current distribution system operations	
Characteristics of utility's service territory and each planning area, including maps, assets in service, and customers served	Narrative
Information on distribution system assets in operation	Narrative
Maximum rated capacity of each substation transformer	Data
Capacity margin of each substation transformer	Data
Number of feeders served by each substation and transformer	Data
Maximum rated capacity of each feeder	Data
Miles of underground and overground feeders by voltage class	Data

[1] Unless otherwise noted, each item listed is essential for the commission and stakeholders to evaluate the utility's plan.

Existing monitoring and control capabilities, limitations, and planned enhancements for interconnection of grid-edge resources (GERs — e.g., distributed generation and energy storage systems)	Data
Non-wires solutions (NWS) in operation	Data
Existing capacity (MW) of energy efficiency and other demand-side programs addressing distribution grid needs, including MW reduction goals per feeder and substation	Data
Primary voltage violations by resource type for the past three years	Data
Power quality complaints by customer class for the past three years	Data
Summary of GER interconnection and utilization	Narrative
Interconnection queue size and queue duration from application to permission to operate — by project type and size range *(Supplemental)**	Data
Information describing how connected GERs provide grid services (e.g., participation in utility demand flexibility programs, enrollment in wholesale market) and characteristics of grid services provided (e.g., capacity, number of events called, duration)	Data
4. Planning approach: Planning processes	
Summary of utility's planning process, including any changes since the previously filed plan	Narrative
Types of inputs and key assumptions and where to find them in the plan, including assumptions that materially impact planning outcomes	Data
Summary of coordination with other regulatory processes (e.g., integrated resource planning, bulk power system planning, coordination between electric and gas planning for dual-fuel utilities, rate cases), including coordination approach and identification of dependencies and potential conflicts between processes	Narrative
4. Planning approach: System analysis methodology and tools	
Summary of distribution system analysis and planning methods	Narrative
Summary of tools used in the planning process, including name, vendor, version, known limitations, and any material embedded assumptions	Narrative
Steps in the planning cycle that use these tools and types of information provided	Narrative
Inputs and outputs for each tool	Data
New tools used in the planning process since the previously filed plan, including capabilities provided and cost	Narrative
Additional tools needed to support the next distribution system planning cycle, including purpose and rationale	Narrative
4. Planning approach: Stakeholder engagement	
Description of stakeholder engagement process, how it informed the distribution plan, and list of stakeholders engaged	Narrative
Summary of stakeholder input, section of plan relevant to the input received, utility actions taken and rationale	Narrative
Planned improvements to stakeholder engagement for next planning cycle	Narrative

4. Planning approach: Utility data access provisions	
Planning-related data-sharing processes and standards, including how they meet regulatory requirements, data formats, accessibility (e.g., portals, downloadable datasets), and update frequency	Narrative
Improvements implemented during planning cycle and resulting benefits *(Supplemental)*[2]	Narrative
5. Reliability and resilience[3]	
Summary of utility's reliability and resilience performance in the past five years, including key drivers, impact of previous activities and expenditures (e.g., those in prior distribution system plans and related utility planning and initiatives), and benchmarking results compared to industry peers	Narrative
Description of the process and analytical approach for assessing past reliability and resilience performance including, if applicable, with respect to target levels*	Narrative
Summary of approach for projecting the frequency and severity of resilience events	Narrative
Reliability statistics	
System Average Interruption Duration Index (SAIDI), excluding major events	Data
System Average Interruption Frequency Index (SAIFI), excluding major events	Data
Customer Average Interruption Duration Index (CAIDI), excluding major events	Data
Customers Experiencing Long Interruption Durations (CELID), by customer class	Data
Customers Experiencing Multiple Interruptions (CEMI), by customer class	Data
Customers Experiencing Multiple Sustained Interruptions and Momentary Interruptions Events (CEMSMI), by customer class *(Supplemental)*	Data
Momentary Average Interruption Frequency Index (MAIFI) *(Supplemental)*	Data
Worst performing circuits, including criteria used*	Data
Benchmark of reliability performance with industry and peers *(Supplemental)**	Data
Resilience statistics	
Overview of resilience events in the utility's service territory in the past 10 years (e.g., storms, wildfires, floods, freezes, seismic events), including restoration costs and times	Data
Major event only SAIDI	Data
Major event only SAIFI	Data
Major event only Customer Minutes of Interruption	Data
Outage causes	Data

[2] *Supplemental* information expands on the essential information to provide greater transparency and enable a better understanding of the utility's plan, proposed near-term actions, and long-term vision.
[3] Also see LBNL's template for grid resilience plans (2024) and LBNL's forthcoming report, *Integrating Resilience Planning in Distribution System Planning*.

Summary of priorities and planned expenditures to maintain or improve distribution system reliability and resilience, including criteria to prioritize expenditures; medium- and long-term strategies; and near-term and ongoing expenditures and programs (e.g., technology and automation, equipment standards, storm readiness)	Narrative and data
Utility infrastructure and processes (e.g., substations, distribution poles, key company facilities) affected and vulnerabilities mitigated (e.g., storms, wildfires, floods, freezes, seismic events)	Narrative
How the action impacts the prevention of, response to, and recovery from resilience events	Narrative
Expected benefits (e.g., reduced restoration costs, shorter outage duration, avoided customer interruption costs)	Data
Timeline, including actual or estimated start and completion dates	Data
Cost estimate	Data
6. Asset management	
Description of asset management strategy and practices for inspections, maintenance, and replacements (e.g., risk-based analysis, predictive maintenance)	Narrative
Description of assessment methodology, including any changes to applicable standards, for each asset category (e.g., poles, conductors, transformers, circuit breakers) and asset health scoring framework	Narrative
Assessment results, including prioritization of asset classes based on predictive failure risk and performance	Narrative
Asset life cycle data *(Supplemental)*	Data
Asset failure rates *(Supplemental)*	Data
Identification of existing and expected risks related to asset health and impacts on system operations	Narrative
Actions taken and planned to manage asset health risks	Narrative
7. O&M expenses: Vegetation management	
Vegetation management strategy	
Overview of vegetation management planning process, programs (e.g., trimming, hazard identification), objectives, priorities, challenges, and changes since the previously filed plan	Narrative
Summary of relevant distribution system information (e.g., distribution system total circuit miles, miles needing trimming, frequency of trimming)	Data
Actions taken and planned to effectively manage vegetation risks	Narrative
Vegetation management programs	
Program scope (e.g., planting trees, scheduled and unscheduled vegetation maintenance, herbicide application) and objectives	Narrative
Program cost drivers (e.g., miles trimmed, frequency of trimming)	Narrative
Description of optimization strategies and tools (e.g., use of advanced analytics)	Narrative
Summary of historical and proposed expenses and associated impact on distribution system objectives	Narrative

7. O&M expenses: Asset O&M	
Description and rationale for planned distribution O&M expenditures and related IT (e.g., asset maintenance and repair, software licenses)	Narrative
Cost estimate for each proposed O&M program, project, or activity for each year of the planning period	Data
8. Capacity expansion planning: Load and GER forecasting	
Load and GER forecasting methodology	
Overview of forecasting process for loads and GERs, including model specification, types of GERs and loads forecasted, and geographic granularity of analysis (e.g., substation-level, feeder-level, or feeder-segments)	Narrative
Changes to forecasting process since the previously filed distribution system plan	Narrative
Summary of load and GER modeling inputs (e.g., economic data, historical load and GER data, weather data, and assumptions), including historical and projected data for each parameter, and identification of sensitivities and ranges for key assumptions	Data
Planned enhancements to the forecast methodology (e.g., deploying new tools and partnering with local stakeholders)	Narrative
GER forecast hourly results, including base cases and scenarios	Data
Load forecasts (e.g., peak demand, energy, and losses), including comparison to historical data	Data
Assessment of the accuracy of previous load and GER forecasts and discussion of variances	Narrative
8. Capacity expansion planning: Scenario analysis	
Summary of sources of uncertainty impacting distribution system needs and solution selection	Narrative
Scenario analysis methodology and data sources, including consistency with scenarios used in other planning processes	Narrative
Improvements to scenario analysis since the previously filed plan	Narrative
Summary of scenarios developed, including rationale for scenario selection	Narrative
Discussion of how scenario analysis informed the planning process and expenditure priorities	Narrative
8. Capacity expansion planning: Hosting capacity analysis (HCA)	
HCA process, including scope, frequency, methods, inputs, and tools	Narrative
Summary of HCA results, including how results are used in other planning and interconnection processes, and identification of constrained areas and implications for future system upgrades	Narrative
Planned future improvements, including timeline	Narrative
Description of any mitigation analyses	Narrative
Description of publicly available results for HCA, including interactive maps, associated granular data in downloadable tables, and file formats for publicly available data	Narrative

9. Solution identification: Grid needs assessment and solution selection	
Description of methodology to identify grid needs, including justification of the utility's planning criteria and asset ratings to assess grid needs (e.g., engineering standards applied, manufacturers' recommendations, percentage loading, frequency and duration of breaches in ratings)	Narrative
Description of grid needs	
Summary of grid needs identified	Narrative
Number of feeders and substations forecast to exceed planning ratings in the near-term (1-5 years) and longer-term (6-10 years)	Data
Detailed information for each grid need	
Asset type (e.g., transformer, feeder), identifier, and equipment rating	Narrative
Description of grid need, including type of grid deficiency, year grid need is observed, and hours grid need is expected to occur (peak day or season)	Narrative
Number of customers by class within the grid need area	Narrative
Typical wires solution	Narrative
Cost estimate for wires solution	Data
Impact on reliability standards if no improvements are made	Data
Description of methodology to identify, assess, and select solutions (traditional utility solutions and utility and third-party NWSs), including the study tool, assumptions, and results under normal and N-1 operating conditions (e.g., equipment loading, number of customers affected)	Narrative
Identification of the portfolio of available alternatives, including operational and capital solutions, and criteria used to evaluate alternatives	Narrative
Summary of solutions selected to address grid needs (pending identification of any suitable NWSs), rationale for the selections, and reasons for rejecting other options	Data
9. Solution identification: Capital investments	
Progress on capital investments since the previously filed plan, focused on projects and programs over a material ($) threshold	
Investment category	Narrative
Investment description, including project ID, project category, objective, project scope, planned in-service date, estimated costs by year, and percentage completion	Narrative
Any material schedule variances to capital investment plan and reasons	Narrative
Any material capital variances to capital investment plan and reasons	Data
Summary of proposed capital investments, including grid needs addressed	Narrative
Estimated costs	Data
Planned schedule	Narrative

9. Solution identification: Non-wires solutions	
Summary of NWS sourcing outcomes based on previously filed distribution system plan, including solutions sourced and methods used (procurements, programs, and pricing), challenges and lessons learned, and implications for current plan and future planning cycles	Narrative
Changes to NWS process since previously filed plan, including drivers (e.g., lessons learned, regulatory compliance, and alignment with leading industry practices)	Narrative
Methodology used to assess viability of NWSs to reliably and cost-effectively address the grid need	Narrative
List of grid needs that will be considered for NWSs, including asset type and identifier	Data
Summary of proposed NWSs and implementation timeline	Narrative
Cost comparison between the traditional solution and NWS, including assumptions used	Data
Contingency plan for NWS non-performance	Narrative
10. Cost-effectiveness	
Cost-effectiveness evaluation objectives, including how results inform planned expenditures	Narrative
Methodologies for evaluating cost-effectiveness of potential grid solutions (e.g., Lowest Reasonable Cost and Benefit-Cost Analysis), including application of multiple planning objectives, and how the utility evaluated uncertainty (e.g., equipment and technology costs, labor availability, supply chain risks, grid contingencies)	Narrative
Impacts considered and quantified	Narrative
Description of uncertainty and sensitivity analysis *(Supplemental)*	Narrative
How uncertainty of inputs used in cost-effectiveness evaluation may affect results *(Supplemental)*	Narrative
Summary of results of sensitivity analyses *(Supplemental)*	Narrative
Detailed information on estimated costs and benefits associated with each expenditure category (subtotals for each cost and benefit considered)	Data
Prioritization process to identify near-term strategy to address grid needs, including any weighting/scoring system	Narrative
11. Implementation: Roadmap	
Utility's implementation plan, including major projects and programs, key milestones, and summary capital investments and expenses by year for the planning period	Narrative
Dependencies between proposed projects and programs and with respect to other utility and state plans and programs	Narrative

11. Implementation: Budgets and Expenditures	
Summary of budget process and budget categories	Narrative
Summary of annual historical expenditures for the past five years by budget category for capital and O&M costs	Data
Discussion of cost variances relative to the last plan	Narrative
Detailed information on planned annual spending by budget category	Data
11. Implementation: Risks and mitigation strategies	
Key implementation risks and analyses to assess them, including likelihood, and potential impact *(Supplemental)*	Narrative
Risk prioritization and mitigation measures considered and planned to address identified risks to plan implementation *(Supplemental)*	Narrative
11. Implementation: Performance assessment	
Progress toward meeting statutory or regulatory performance metrics, including comparison of planned vs. actual performance, where available *(Supplemental)**	Narrative
Progress toward meeting other performance metrics *(Supplemental)**	Narrative

*A link to where the utility separately filed this information can suffice.