

Reviewing Utility Distribution Plans

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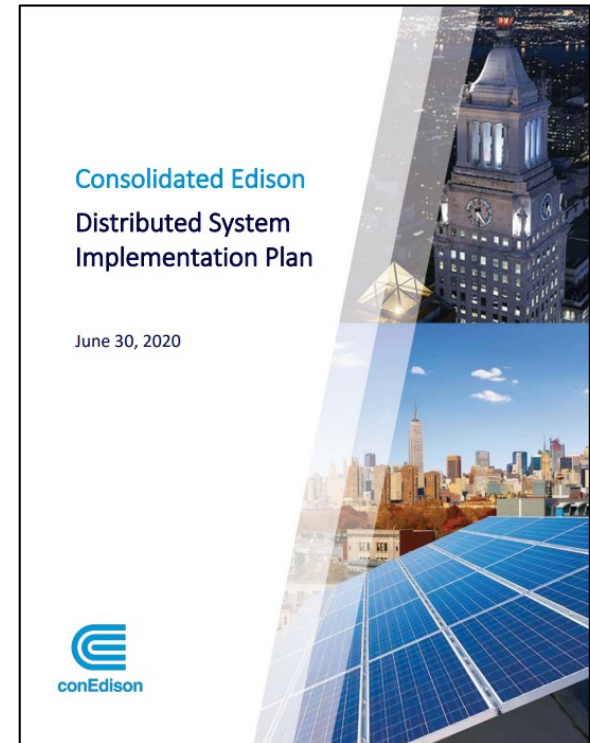
**National Association of Regulatory Utility Commissioners
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- ▶ Integrated distribution planning (IDP) is an evolving practice because it accounts for new and emerging grid technologies and processes:
 - For example, distributed energy resources (DERs), analysis of non-wires alternatives (NWA), layering core components and applications for grid modernization
- ▶ States take different approaches to IDP, and there are many options for how to review IDPs.
 - Sometimes the options are dictated by statutes or regulations.
 - Typically, commissions have a lot of discretion.
- ▶ For a comprehensive overview of state IDP activities, see:
 - Lawrence Berkeley National Laboratory, *State Regulatory Approaches for Distribution Planning*, Schwartz and Mims Frick, Training webinar on electricity system planning, New England Conference of Public Utilities Commissioners, June 16, 2022. [Link](#)
- ▶ This presentation will walk through the key elements of IDPs and offer suggestions for the types of questions to ask when reviewing IDPs.

Filing Requirements

- ▶ Commissions can establish IDP filing requirements upfront – to encourage complete filings and expedited review.
- ▶ As Commission expectations for IDP evolve, it is especially important to establish and update filing requirements.
- ▶ Outline of filing requirements
 - Overall IDP strategy and objectives
 - Description of the current distribution system
 - Planned retirements and committed additions
 - Advanced load forecasting
 - Assessment of grid needs
 - Identification of new options for meeting needs
 - Economic analysis of those options
 - Action plan for implementing chosen options



Load and DER Forecasting

► Forecasting methods and inputs

- Does the forecast use probabilistic analyses to account for uncertainties?
- Does the forecast use multiple scenarios to account for unknowns?
- Does the forecast include feedback iterations based on other elements of the IDP?
- Is there consistency between forecasts for IDP and other utility planning processes (e.g., resource planning, energy efficiency planning)?

► Locational details

- Does the load forecast include peak demands at the circuit or substation level?

► Temporal details

- Is the peak load forecast sufficiently granular?
 - Hourly, daily, weekly, monthly, annual?

► DER forecasts

- Does the load forecast account for all types of future DERs and both naturally-occurring and utility-sponsored future DERs?

Assessment of Grid Needs

► Assessment of current system

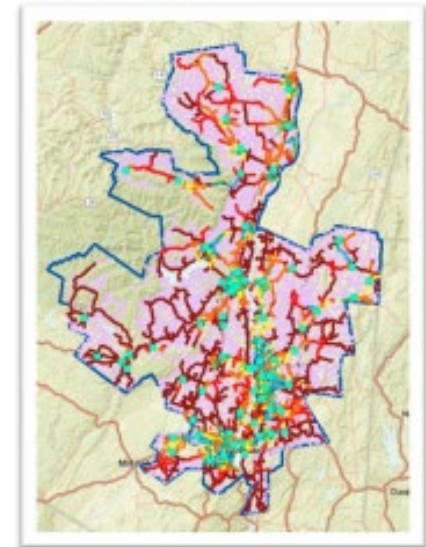
- Does the IDP include an assessment of existing equipment condition, reliability performance, resilience performance, historical spending, and DER interconnection needs?

► Ensure safety, reliability, security

- Does the IDP identify where upgrades are needed for safety, reliability, and resilience?
- Does the IDP identify storm hardening needs?

► Optimization of DERs

- Does the IDP identify where the grid would benefit from DER?
- Does the IDP include a sound DER hosting capacity analysis?
- Does the IDP provide detailed “value of DER” estimates for different parts of the distribution system?
- Does the IDP address the interconnection of DERs?

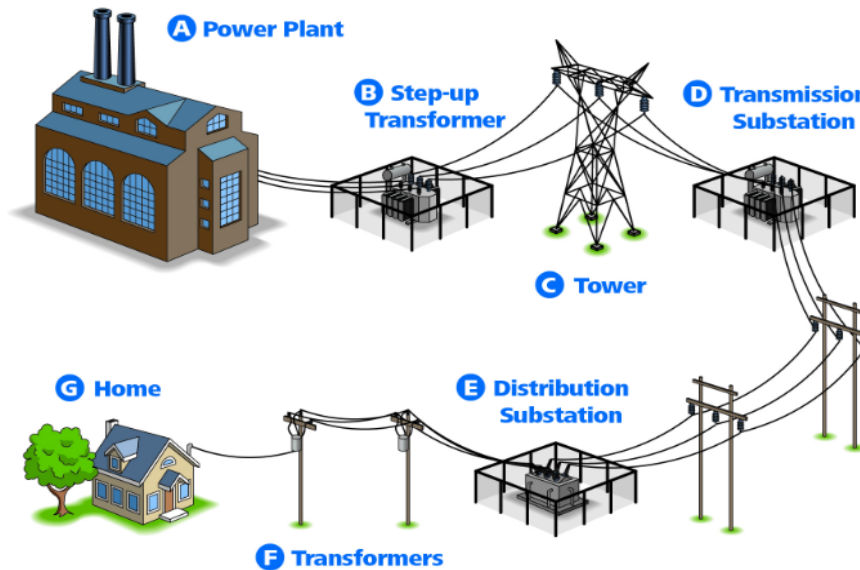


Source for hosting capacity graphic: *Central Hudson 2020 DSIP General Information Session*, September 21, 2020

Identification of New Options: Traditional Options

► Traditional distribution options

- Does the IDP include all traditional options?
 - Substations, transformers, feeders, new poles, distribution line extensions?



Identification of New Options: NWAs

- ▶ Does the NWA analysis consider all options?
 - Customer-owned DERs at the location of need?
 - Energy efficiency, demand response, distributed generation, distributed storage?
 - Utility-owned resources at the location of need?
 - For example, storage (large or small)

- ▶ Does the NWA analysis consider all options for obtaining DERs?
 - Procurement, programs, pricing?

- ▶ Does the NWA analysis use appropriate economic analysis techniques?
 - Are the methods and assumptions consistent with those used for other options?

- ▶ Does the NWA analysis properly account for potential distribution investment deferral?
 - Does it use appropriate thresholds for identifying candidates?
 - Thresholds for the magnitude of distribution investment to be deferred?
 - Thresholds for the time to develop the NWA?

Identification of New Options: Grid Modernization



- ▶ Are grid modernization goals and objectives clearly articulated?
 - Are these goals consistent with state policy and regulatory guidance?
 - Are the grid modernization investments proposed consistent with state objectives?
- ▶ Are the grid modernization proposals consistent with the utility's distribution, transmission, and resource plans (if relevant)?
- ▶ Does the IDP apply appropriate economic analysis techniques?
 - To what extent are grid modernization components evaluated together or separately?
 - Does the economic analysis properly address interrelated grid mod components?
 - Does the economic analysis properly account for non-monetary impacts?
- ▶ Does the IDP present options for phasing in grid mod components?
 - Phasing in grid mod components over time can reduce risks.
- ▶ How will the utility report on performance of grid mod projects?
 - Does the IDP include metrics with concrete measurable outcomes?

Economic Analyses: Principles

- ▶ With so many options for meeting distribution needs, IDPs should prioritize and justify which options are in the best interest of customers.
- ▶ Does the economic analysis:
 - Account for the state's energy policy goals?
 - Compare new resource options consistently with traditional options?
 - Account for all relevant costs and benefits, including those difficult to monetize?
 - Include an appropriate study period, including the full life-cycle of options?
 - Properly address locational impacts?
 - Properly address temporal impacts?
 - Address relevant costs and benefits symmetrically?
 - Consider customer equity issues?
 - Use the appropriate discount rate, reflecting regulatory goals?
 - Include a separate assessment of rates, bills, and participation?
 - Document assumptions, methods, and results transparently?

Economic Analysis: Least-Cost/Best-Fit vs. BCA

Two primary techniques for economic assessments for IDP

Technique	Need	Purpose	Costs	Benefits	Example Applications
Least-Cost/ Best-Fit	Need for the investment has been established	To identify the investment that meets the need at lowest cost	<u>Included</u> Typically includes only utility system costs	<u>Not Required</u> Benefits are not necessarily accounted for; presumed to exceed the costs	Constructing a new distribution line to serve a new residential development
Benefit-Cost Analysis	Need for the investment has <u>not</u> been established	To determine whether to make the proposed investment	<u>Included</u> Extent of costs depends upon BCA test chosen	<u>Included</u> Extent of benefits depends upon BCA test chosen	Investments in NWA's and advanced meters (often but not always)

Stakeholder Engagement

► Breadth of stakeholders

- Did the stakeholders include all groups that might be affected by the IDP?

► Meaningful engagement throughout

- Were stakeholders meaningfully engaged?
 - Before the IDP was developed?
 - During IDP development?
 - During commission review of the IDP?



► Technical working groups

- Were technical working groups used to facilitate stakeholder engagement?

► Independent experts

- Were independent experts used to support stakeholders in their review and input?



Action Plans

▶ Timeline

- Does the Action Plan address short- to medium-term actions, e.g., 3-5 years?

▶ Capital investment plans

- Does the Action Plan articulate where and when capital investments will be made?
 - Replacement of aging infrastructure? Distribution system upgrades? Grid mod elements, storm hardening infrastructure, others?

▶ Procurement of NWAs

- Does the Action Plan describe when and how NWAs will be procured?

▶ Hosting capacity analyses

- Does the Action Plan describe when the results will be provided and updated?
- Does the Action Plan describe who will have access to the analyses and how (e.g., standardized maps and data)?

▶ DER interconnection practices

- Does the Action Plan describe the steps the utility will take to ensure streamlined interconnection of the DERs forecasted and included in the IDP?

▶ Traditional distribution investments

- Regulatory review begins in an IDP
- Cost recovery decision typically occurs in rate cases
- Costs typically recovered through base rates
- Some states use riders to allow for some distribution expenditures

It is important to ensure the different cost recovery approaches do not provide utilities with inconsistent incentives.

▶ Non-traditional distribution investments

For example:

- Cost recovery might depend on type of commission action on the plan.
 - Acceptance (informational filing only) or limited preapproval
- Ultimate approval of cost recovery typically occurs in rate cases.
- In some cases, grid modernization costs can be recovered through riders.

Cost Recovery: Customer Protection



Regulators can use cost recovery approaches to ensure that customers experience net benefits from large distribution investments (e.g., grid mod).

▶ Incentive for maintaining low costs

- Limit the amount of costs that the utility can recover to the costs assumed in the IDP
 - Require the utility to absorb cost overruns
 - With allowances for contingencies

▶ Incentive for achieving benefits

- Limit the amount of future costs that the utility can recover based on achievement of benefits assumed in the IDP
 - Require utilities to absorb a portion of costs if benefits are not achieved
 - Use metrics to assess achievement of benefits
 - With allowances for contingencies



Commission Actions

► Commission options

- Accept the IDP as meeting filing requirements; no approval process
- Approve the IDP as filed
- Require utility to modify IDP to address issues raised in review
- Reject portions of the IDP and accept other portions
- Reject the IDP

Commission options might be limited by statutes, regulations, or precedent.

► Implications of Commission acceptance or approval

- Informational filing only
 - Commission is not bound by the IDP in future rate cases
- Limited “pre-approval” of investments
 - Approve the *need* identified in the distribution plan
 - Approve the *solutions and technologies* proposed in the plan
 - Approve the *economic assessment* of the costs and benefits
- Prudence
 - Prudence is rarely, if ever, established as a result of the IDP review

Useful Resources



GridLab, *Integrated Distribution Planning: A Path Forward*, prepared by Kurt Volkmann, 2018. [Link](#)

Grid Modernization Laboratory Consortium, *Benefit-Cost Analysis for Utility-Facing Grid Modernization Investments: Trends, Challenges, and Considerations*, prepared by Synapse Energy Economics, 2021. [Link](#)

ICF, *Integrated Distribution Planning*, prepared for the Minnesota Public Utility Commission, August 2016. [Link](#)

Lawrence Berkeley National Laboratory, *State Regulatory Approaches for Distribution Planning*, Schwartz and Mims Frick, Training webinar on electricity system planning, New England Conference of Public Utilities Commissioners, June 16, 2022. [Link](#)

Minnesota Department of Commerce, *Review and Assessment of Grid Modernization Plans: Guidance for Regulators, Utilities, and Other Stakeholders*, Docket No. E002/M-21-814, 2022. [Link](#)

New York Public Service Commission, *Order Adopting Distributed System Implementation Plan Guidance*, Case 14-M-0101, Proceeding on motion of the Commission in Regard to Reforming the Energy Vision, April 2016. [Link](#)

National Association of Regulatory Commissioners & National Association of State Energy Offices, *Task Force on Comprehensive Electricity Planning*. [Link](#)

National Energy Screening Project, *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources*, August 2020. [Link](#)

Regulatory Assistance Project, *Integrated Distribution Planning for Electric Utilities: Guidance for Public Utility Commissions*, October 2019. [Link](#)

Smart Electric Power Alliance, *Integrated Distribution Planning: A Framework for the Future*, September 2020. [Link](#)

US DOE, *Modern Distribution Grid: Strategy & Implementation Guidebook*, Volume IV, 2020. [Link](#)

Contact



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is a research and consulting firm specializing in technical analyses of energy, economic, and environmental topics. Since 1996 Synapse been a leader in providing rigorous analysis of the electric power and natural gas sectors for public interest and governmental clients.

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