DOCKETED	
Docket Number:	26-IEPR-03
Project Title:	Electricity and Gas Demand Forecast
TN #:	273681
Document Title:	Effectively Considering the Distribution System in Integrated Resource Planning
Description:	N/A
Filer:	J Padilla
Organization:	The Regulatory Assistance Project
Submitter Role:	Commission Staff
Submission Date:	11/17/2026 1:06:31 PM
Docketed Date:	11/17/2026



Nov. 17, 2026

Effectively Considering the Distribution System in Integrated Resource Planning

California Energy Commission Demand Analysis Working Group

Prepared for Lawrence Berkeley National Laboratory

Grace Relf
grelf@raponline.org

Objectives and Agenda

- **Objectives**
  - Illustrate the **value of coordinating and integrating** electric system planning processes
  - Highlight **key touchpoints** between distribution system planning (DSP) and integrated resource planning (IRP)
  - Demonstrate the range of tactics available to states and utilities and provide examples of **common and leading practices**

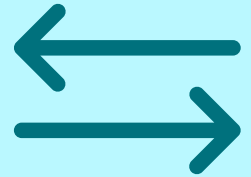
- **Agenda**
  - The Value Proposition for Planning Coordination and Integration
  - Coordination and Integration Activities
  - Examples of Common and Emerging Practices
  - Key Takeaways

Scope

- Berkeley Lab's research focuses on **how to better consider elements of DSP as part of IRP** or other long-term planning processes for bulk power systems.
  - The research is national in scope, and is based on a review of foundational literature, subject matter expert interviews, regulatory and other desk research, and detailed case studies in a group of geographically diverse states each with explicit or emerging coordination efforts.
- This is one aspect of many coordinated and integrated planning techniques that may improve the quality and effectiveness of bulk power plans to identify an optimal set of resources to meet future needs at least cost.

Coordinated

IRP and DSP are conducted separately, with key bridges between each process



Integrated

IRP and DSP are conducted as part of the same planning process, or DSP is substantively embedded within IRP processes



The Value Proposition for Coordination and Integration

Why Coordinate? Overall Benefits

Coordinating various plans improves electricity system planning outcomes by:



Aligning inputs, methods, and information flows across plans for improved consistency



Ensuring that all factors that influence system needs are captured



Creating a holistic picture of investment alternatives that can result in cost savings



Increasing understanding, transparency, and credibility of plan results



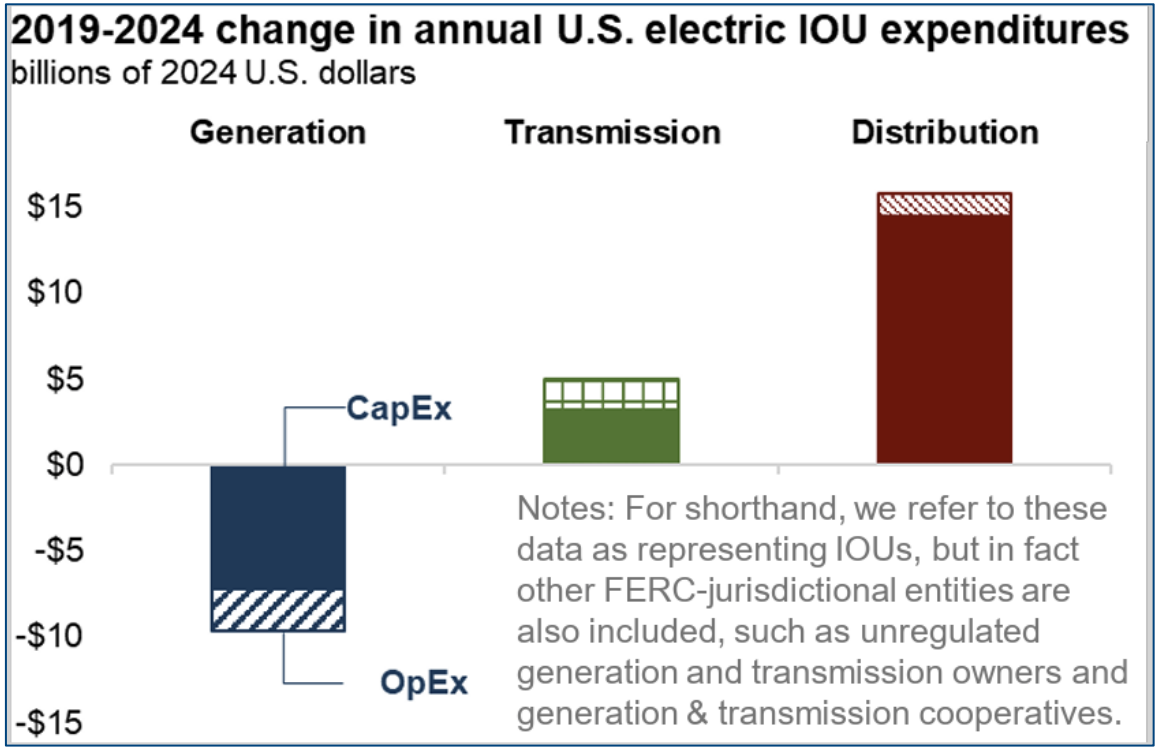
Improving stakeholder ability to participate, resulting in higher quality information available to planners and decision-makers



Applying knowledge from multiple planning processes to realize efficiencies

Distribution System Planning is Increasingly Important

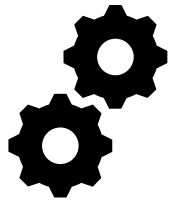
- Distribution system investments account for the largest portion of CapEx for U.S. investor-owned utilities — 32% in 2025 (estimated $66.5B).
  - Distribution CapEx rose in all U.S. regions over the last 5 years.
- Distribution resources affect the type, timing, and amount of bulk system needs.



Also see Wiser et al. (2026), *Electric Utility Distribution Costs: Scoping Study on Trends, Drivers, and Possible Response Strategies*, Berkeley Lab

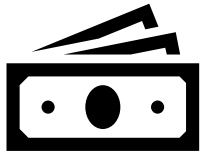
Sources: EEI 2025, Wiser et. al, 2025

Value of Incorporating DSP Elements in IRP



Optimize electricity system infrastructure

- Avoid need to touch infrastructure more than once
- Avoid line losses by building resources closer to load
- Site distribution assets to reduce needs and constraints
- Build and operate system to optimize across all levels
- Enhance procurement with better information about optimal resource timing and siting
- Defer some infrastructure investments by optimizing use of existing distribution assets



Reduce costs

- Reduce overly conservative assumptions
- Assess all possible solutions



Improve stakeholder credibility, transparency, and communication

- Provide greater insight into distribution expenditures that may drive rate increases
- Strengthen justification of utility investments
- Reduce internal utility functional silos

Expert Perspectives: Value of Incorporating DSP Elements in IRP

A commitment to least-cost planning requires integration across planning processes.

There is significant value in getting DSP and IRP teams to talk to one another.

Integrated planning creates a paradigm shift in how utilities treat distribution-level assets and operations.

A holistic, long-term view helps to avoid "fire fighting" in addressing system needs.

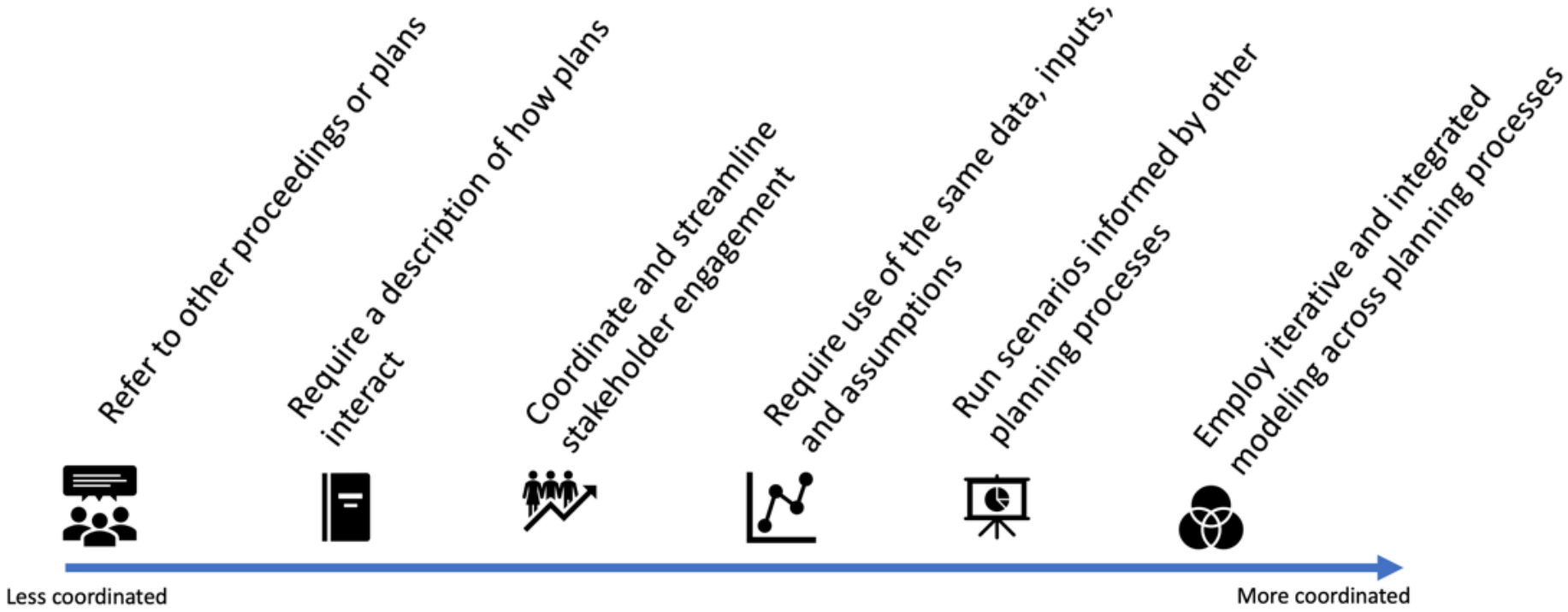
Integrating DSP elements in IRP can add complexity and time to the process without commensurate value.

Example responses in Berkeley Lab interviews with utilities, PUCs, and other experts

Coordination and Integration Activities

Range of Coordination Approaches

- Actions to coordinate plans range in complexity and impact, depending on resource availability (e.g., staff time and modeling tool capabilities), plan maturity, and planning objectives.



Source: Berkeley Lab

Administrative Coordination Tactics



- **Establish robust data management systems to support advanced analyses and information-sharing.**
  - Currently, no single model effectively optimizes all levels of a system.
  - Data marshalling is hard, but planners can fix bad data.



- **Create consistent, meaningful, and streamlined opportunities for stakeholders.**
  - Communicate clearly, using standard naming conventions, updated calendars, and webpages.
  - Solicit candid feedback regularly throughout the process.



- **Reduce internal utility silos.**
  - Change management is important when undertaking novel planning practices.
- **Consider timing requirements across planning processes and sequence appropriately.**



  - Keep processes separate where appropriate to ensure sufficient depth of analysis and expertise and avoid using resources where not needed.
  - Conduct planning in bite-sized pieces to support forward progress.

Analytical Coordination

Load and DER forecasting, including scenario planning

- Sequenced planning and forecasting cycles
- Aligned IRP and DSP forecasting methods
- Use of the same scenarios and sensitivities across plans

Distribution grid optimization

- Load factor optimization
- Integration of DER, including:
  - Hosting capacity analysis
  - Streamlined interconnection procedures
  - Flexible connection options
  - DER deliverability reviews (verify pathways to delivering bulk system services)

Integrated system analysis

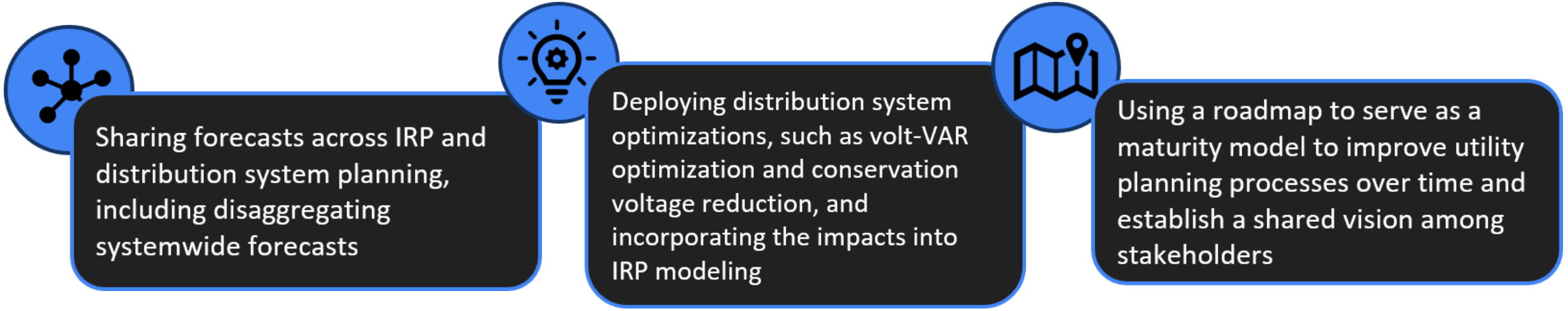
- Convergent and divergent value analysis
- Co-optimizing bulk and distribution-connected resources
- Coordinated procurement processes

Examples of Common and Emerging Tactics

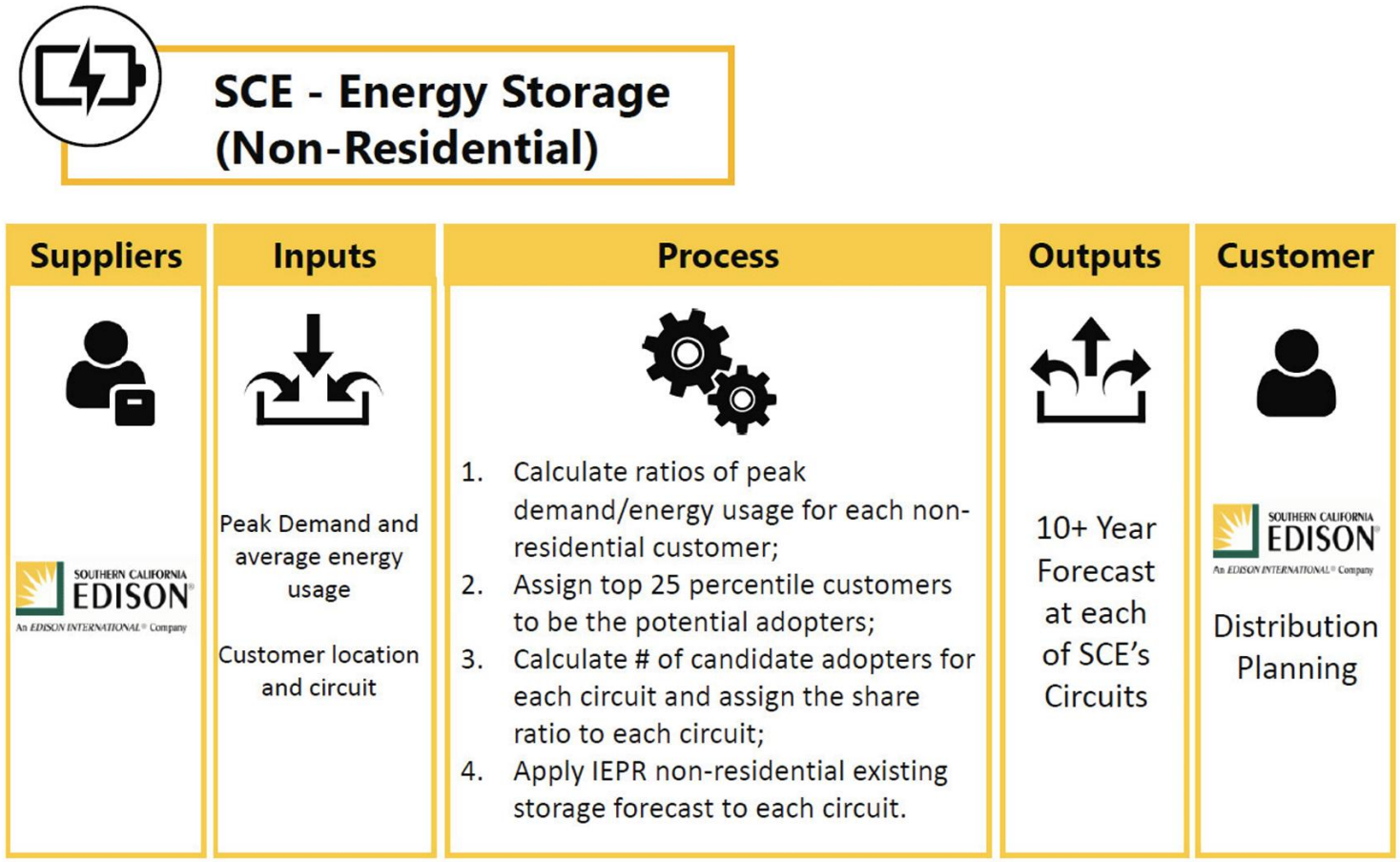
Findings – Plan Coordination

- At least 18 states require some form of coordination between DSP and other electric system plans.

Common Steps for Considering DSP Elements in IRP



Examples of Leading Tactics – Forecasting Alignment

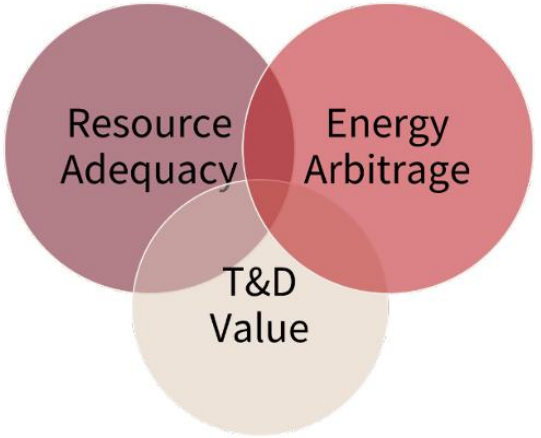


Source: SCE, 2025

Examples of Leading Tactics – Co-Optimizing Resources

- **Following initial development in its 2024 IRP, Xcel Energy (MN) is implementing a Capacity*Connect program.**
  - The program includes deploying 50–200 MW utility-owned and operated distribution-sited batteries through 2028 at a cost of $152–$430M.
  - Benefits are projected at $150M in avoided costs and $290M in additional value.
- **The program will provide operational experience for optimizing the distribution system for bulk system benefits.**
  - Xcel expects most of the value from battery participation as a capacity resource in the ISO's resource adequacy construct and additional value from participation in an energy market or through avoided energy market purchases.
  - Xcel aims to site batteries where distribution and bulk loads coincide to reduce or defer investments.

Program Value Streams



Source: Xcel MN, Docket 25-378

Key Takeaways

- **States and utilities are taking meaningful steps to coordinate and integrate IRP and DSP.**
  - Evaluating the impacts of integration is challenging, but maximizing use of distribution-level assets improves grid utilization and may reduce utility spending overall.
  - Increased consideration of the distribution system in bulk power system planning can help keep down electricity customer costs at a time of growing grid needs.
- **Identify key bridges between both planning processes to maximize efforts.**
  - More sophisticated planning practices may be needed, but the utility — stakeholder input — can identify initial steps that provide near-term value and phase in improvements over time.
- **Good planning depends more on people than tools.**
  - Communication among utility planners, regulators, and stakeholders in collaborative venues is key.
  - Expertise across stakeholders at the nexus of DSP and IRP is nascent.

About RAP

Regulatory Assistance Project (RAP)® is an independent, global NGO advancing policy innovation and thought leadership within the energy community.

Learn more about our work at raponline.org

Grace Relf
grelf@raponline.org

Contact

Natalie Mims Frick: nfrick@lbl.gov

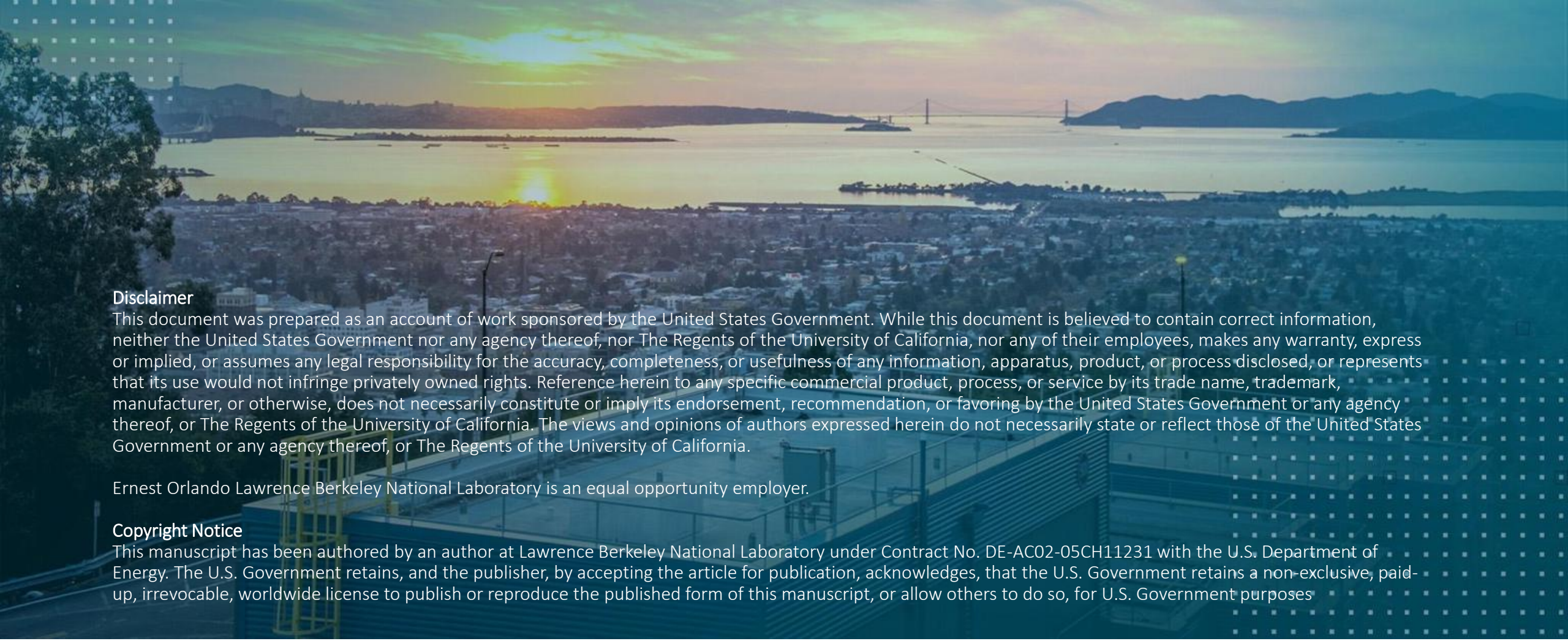
For more information

Download publications: https://emp.lbl.gov/publications
Sign up for our email list: https://emp.lbl.gov/mailing-list
Follow us on social media: @BerkeleyLabEMP and @BerkeleyLabEMP.bsky.social

Acknowledgements

This presentation was funded by the U.S. Department of Energy's Office of Electricity under Contract No. DE-AC02-05CH11231. The author is solely responsible for any omissions or errors contained herein. The presentation is based on Berkeley Lab's report, Relf et al. (2026), *Effectively Considering the Distribution System in Integrated Resource Plans*.

The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof, or The Regents of the University of California.



Disclaimer
This document was prepared as an account of work sponsored by the United States Government. While this document is believed to contain correct information, neither the United States Government nor any agency thereof, nor The Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or The Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof, or The Regents of the University of California.

Ernest Orlando Lawrence Berkeley National Laboratory is an equal opportunity employer.

Copyright Notice
This manuscript has been authored by an author at Lawrence Berkeley National Laboratory under Contract No. DE-AC02-05CH11231 with the U.S. Department of Energy. The U.S. Government retains, and the publisher, by accepting the article for publication, acknowledges, that the U.S. Government retains a non-exclusive, paid-up, irrevocable, worldwide license to publish or reproduce the published form of this manuscript, or allow others to do so, for U.S. Government purposes



Energy Technologies Area
BERKELEY LAB