NARUC Summer Policy Summit

Actionable Insights and Informed Decisions

Committee on Energy Resources and the Environment

WORLD RESOURCES INSTITUTE

LCOE

LEVELIZED COST OF ELECTRICITY

BUILDING A BETTER NARRATIVE

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July 2025

THE NARRATIVE: 'RENEWABLES ARE CHEAPEST'

Over 90% of new renewables produced electricity for less than the cheapest new fossil fuel alternative.

United Nations | Secretary-General

"Onshore wind and solar PV are cheaper today than new fossil fuel plants almost everywhere and cheaper than existing fossil fuel plants in most countries."

iea Executive Director

In 2024, solar photovoltaics were, on average, 41% cheaper than the lowest-cost fossil fuel alternatives, while onshore wind projects were 53% cheaper.

IRENA
International Renewable Energy Agency

Lazard: solar and wind retain lowest LCOEs

- RTO Insider

Fossil fuels cost more than unsubsidized wind and solar, Lazard says

- Climate Wire

HOW SHOULD LCOE BE USED?

NREL Competitiveness Metrics for Electricity System Technologies, *T. Mai et al, 2021*

"LCOE is an incomplete metric… LCOE is not designed to capture a technology's full economic value to the system..." [p.vi]

"LCOE is commonly used to communicate technology comparisons. This use can be appropriate to track

- **the cost and performance progress of a single technology over time**
- **or to compare technologies that operate similarly and that primarily provide energy services." [p.14]**

eia *Levelized Costs of New Generation Resources in the Annual Energy Outlook 2023*

"Direct comparisons of LCOE across technologies are misleading as a method to assess economic competitiveness"

Integrated resource planning practices for uncertainty

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NARUC Summer Policy Summit – Boston, MA – July 28th, 2025
Actionable Insights and Informed Decisions Panel

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

Planning has always dealt with uncertainty … what's different?

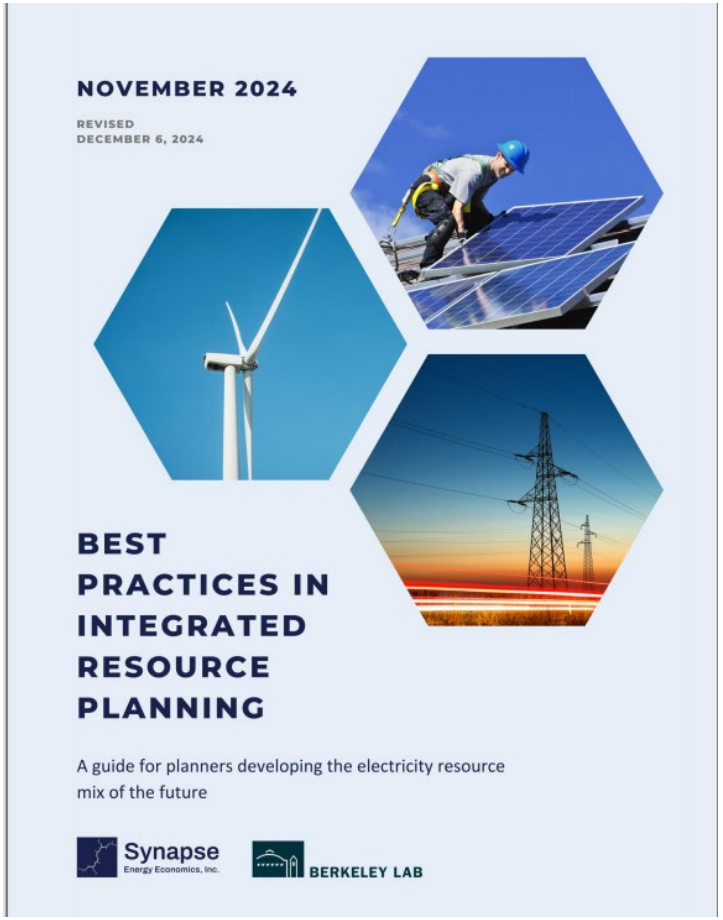
- IRP is a scenario-based exercise, but …
- Load growth
  - Historically, used high/low scenarios with small single digit spreads (±1-3% compound growth)
  - Now, rate of growth is unprecedented, but also location matters!
- Historical focus on cost-related risk
  - IRP has historically focused on cost risk and uncertainty was focused on fuel prices
  - Now we are adding reliability/resilience performance that is not monetized, but has high performance risk
  - Uncertainty in cost and availability of emerging technologies create new portfolio risks
- New resource performance needs
  - Frequency and severity of extreme events challenges the way we model system stress and plan for it

Uncertainties and Risks	Examples
Technology advancement (CCS, hydrogen, small modular reactors)	Tucson Electric Power 2023 – P09 Portfolio with Small Modular Reactors (TEP 2023a)
Long-duration storage	Public Service Company of New Mexico 2023 – long-duration storage scenario (PNM 2023)
Extreme weather	PacifiCorp 2023 – extreme weather load forecast sensitivity (PacifiCorp 2023)
Change in reliability requirement or reserve margin	Public Service Company of New Mexico 2023, Avista 2023, Xcel Energy Upper Midwest 2024 (PNM 2023; Avista 2023; Xcel Energy 2024)
Increased industrial and data center loads	Xcel Energy Upper Midwest 2024 – data center load sensitivity (Xcel Energy 2024)
Increased transmission buildout	PacifiCorp 2023 – All Gateway scenario (PacifiCorp 2023)
Stakeholder-requested scenarios	Public Service Company of New Mexico 2023, Avista 2023, PacifiCorp 2023, DTE Electric Company 2022, Duke Energy Indiana 2021 (PNM 2023; Avista 2023; PacifiCorp 2023; DTE 2022; DEI 2021)
Commission-mandated scenarios	Public Service Company of New Mexico 2023 – impacts of a range of carbon prices (PNM 2023)

Sample of uncertainties and risks studied in recent IRP (LBNL/Synapse, 2024)

A few practices to plan under uncertainty

- Smart use of scenario-based planning
  - What resources are showing up across scenarios?
  - Should those resources be part of a preferred portfolio that accounts for cost as well as uncertainty?
- Leverage low cost, fast deployment, and modular resources
  - Demand side resources, small gas turbines, battery storage, tend to have lower cost, lower deployment times, and are more modular than most supply side resources
  - How can we capture these features in IRP?
- Load growth and affordability
  - How likely is the new load to increase system utilization and benefit all customers by diluting fixed costs over larger sales volumes?
- Tightening your resource adequacy assessment with planning decisions
  - Robust connection between RA and planning
  - Awareness of the seams between RA and planning decisions for LSE's under ISO/RTO
  - Use consistent accreditation methods for all resources



The seam between RA planning and procurement

Pure vertical integration (Western/Southern U.S.)

- No ISOs, decisions made through IRP if available
- RA needs and supply made by same entity

Vertical integration within markets (SPP, MISO)

- ISOs hosting several regulated entities
- RA need define by entity that does not make decisions; risk of non-coordination

Pure markets (ISO-NE, NYISO, ERCOT)

- ISOs with little to no regulated entities making RA decisions
- Coordination of RA need and supply through markets

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July 28, 2025

Katherine Peretick, Commissioner

Michigan Public Service Commission

Katherine Peretick was appointed to the Michigan Public Service Commission by Governor Gretchen Whitmer on January 4, 2021, and reappointed on July 3, 2021. She serves on the following boards and committees:

- NARUC Board of Directors
- NARUC Committee on Electricity
- DOE-NARUC Nuclear Energy Partnership
- Chair of the NARUC Electric Vehicles State Working Group
- Board of Directors for the Organization of PJM States
- Chair of the advisory council for EPRI
- FERC's Federal and State Current Issues Collaborative
- Chair for the Nuclear Waste Strategy Coalition

The Michigan Public Service Commission serves the public by ensuring safe, reliable, and accessible energy and telecommunications services at reasonable rates.

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