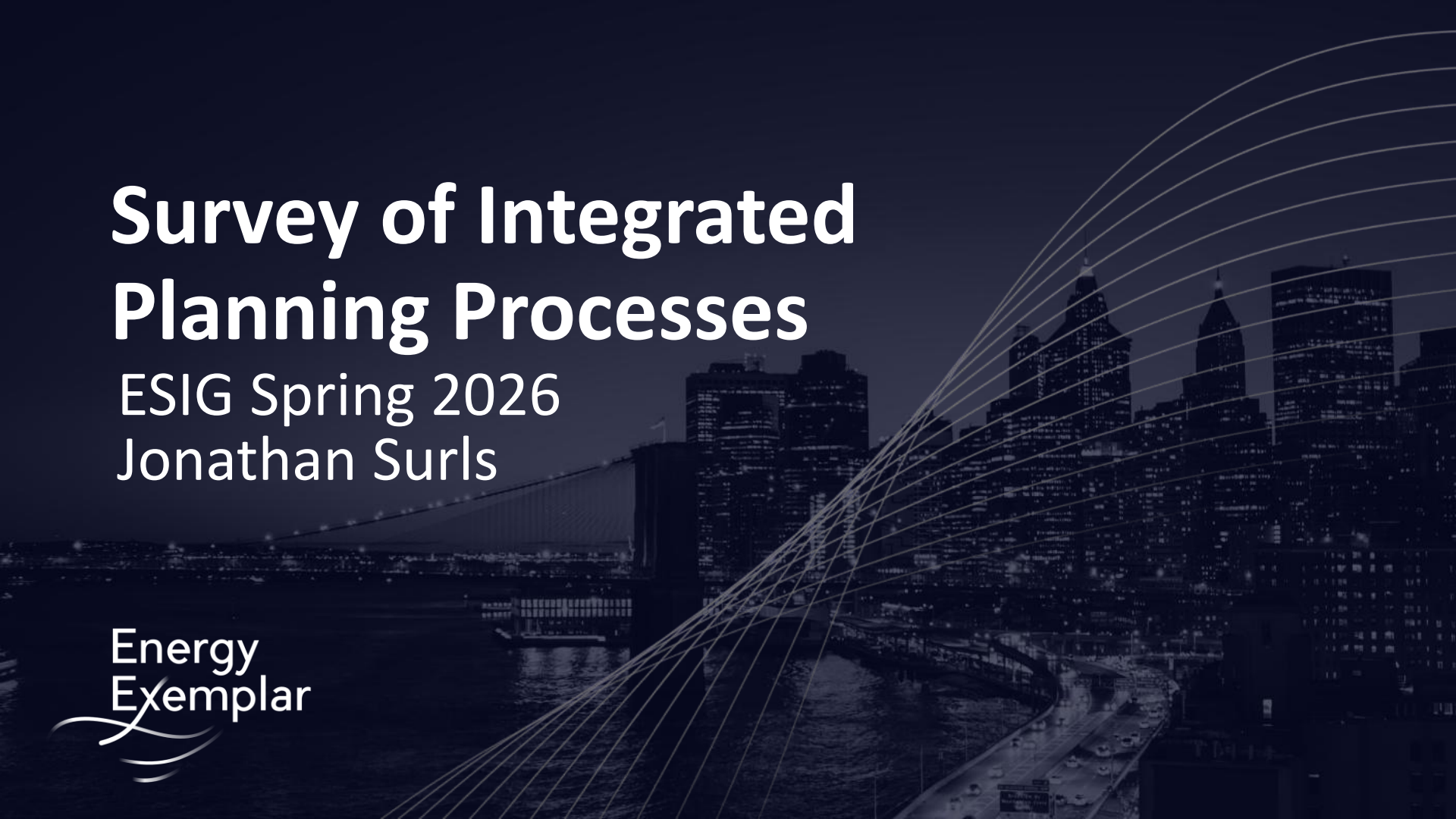

Survey of Integrated Planning Processes

ESIG Spring 2026

Jonathan Surls

Energy Exemplar

Energy Exemplar Supporting Planning Processes

1 Utilities

PacifiCorp
Dominion Energy
NVEnergy
Platte River Power Authority
SDGE
SRP
aps

2 ISO's

pjm
MISO
ieso
Connecting Today. Powering Tomorrow.
ISO new england
CAISO
New York ISO
Independent System Operator

3 Thought Leadership

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Agenda

- Signs of Energy Transition
- Integrated Planning Direction
- Examples of Innovative Approaches

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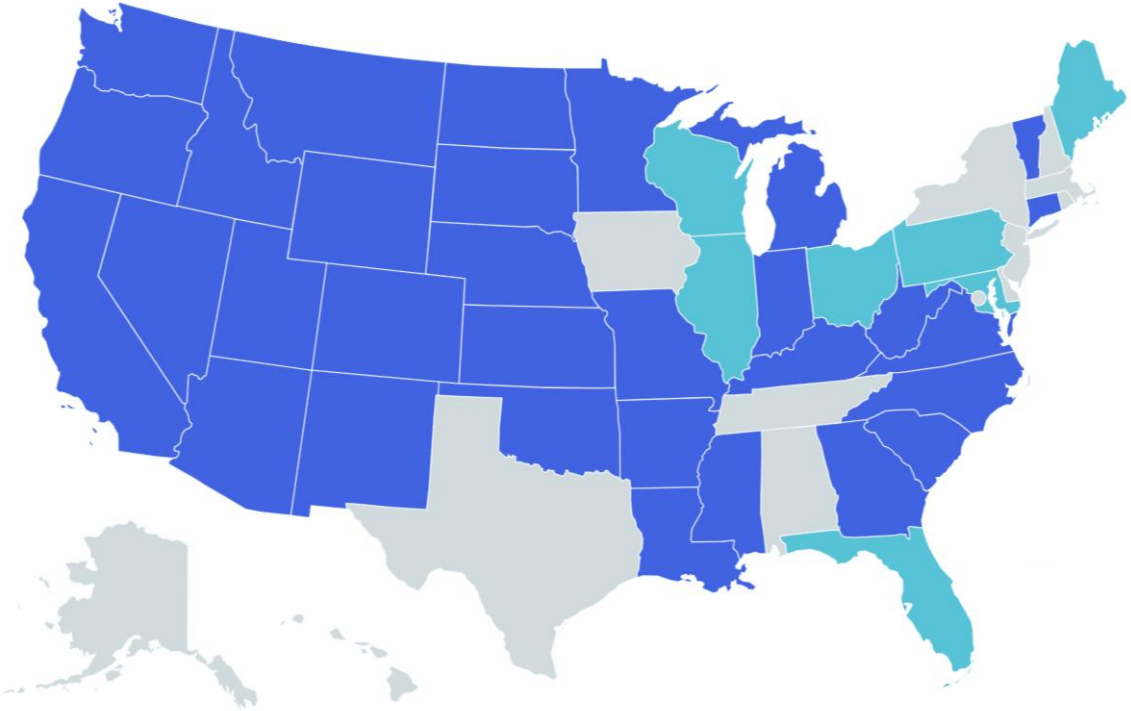
Signs of Transition

States Requiring an IRP



State has an IRP and filing requirements

State has a filing requirement for long-term plans

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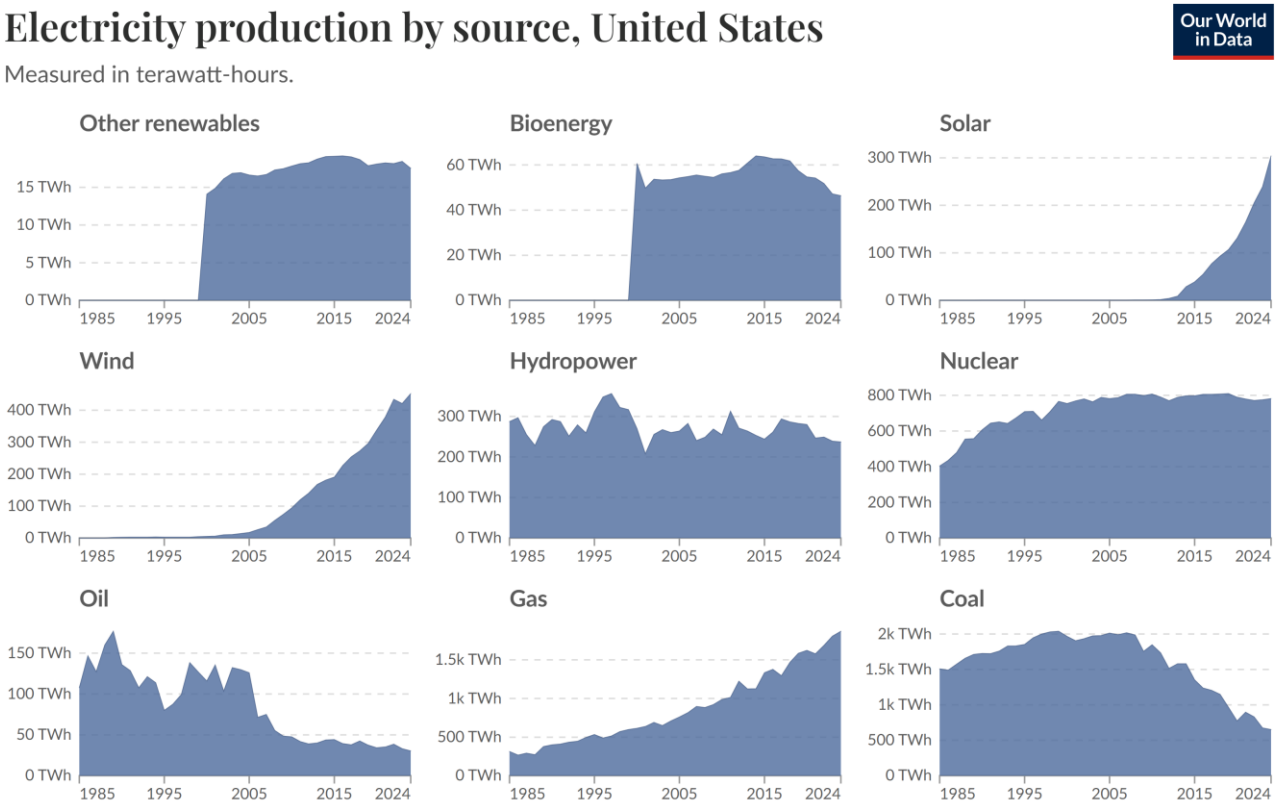
Significant Changes in Electricity Production, US



Data source: Ember (2026); Energy Institute - Statistical Review of World Energy (2025)
Note: "Other renewables" include geothermal, wave, and tidal.

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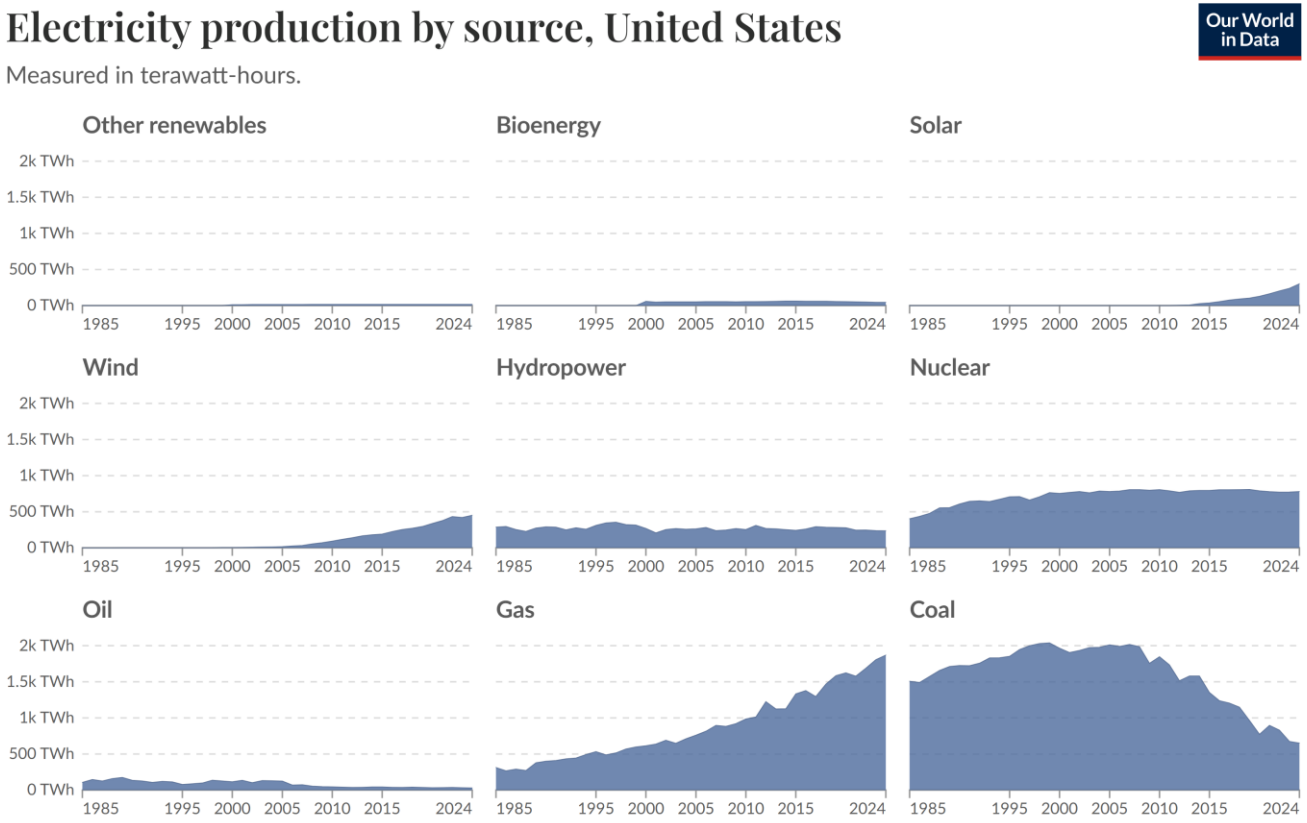
Significant Changes in Electricity Production, US



Data source: Ember (2026); Energy Institute - Statistical Review of World Energy (2025)
Note: "Other renewables" include geothermal, wave, and tidal.

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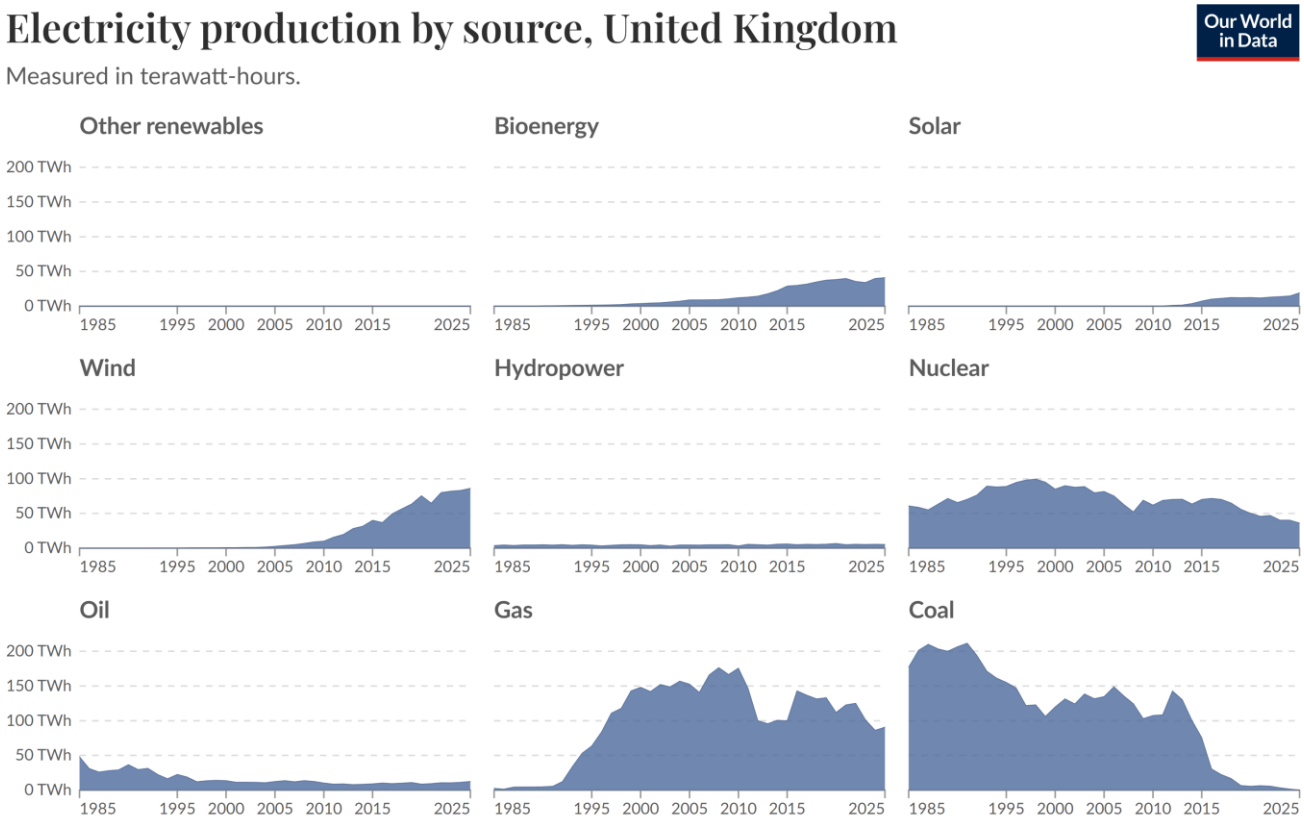
Significant Changes in Electricity Production, UK



Data source: Ember (2026); Energy Institute - Statistical Review of World Energy (2025)
Note: "Other renewables" include geothermal, wave, and tidal.

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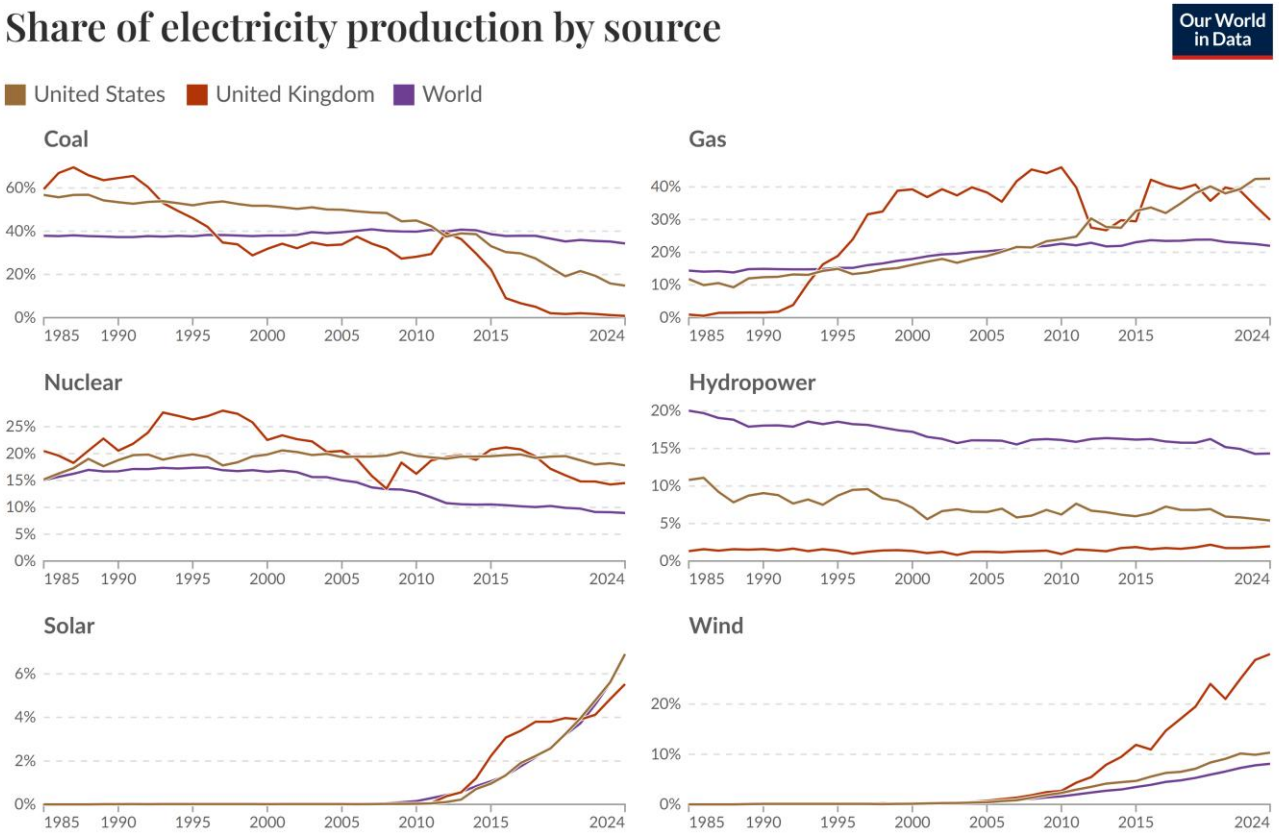
Percentage Share



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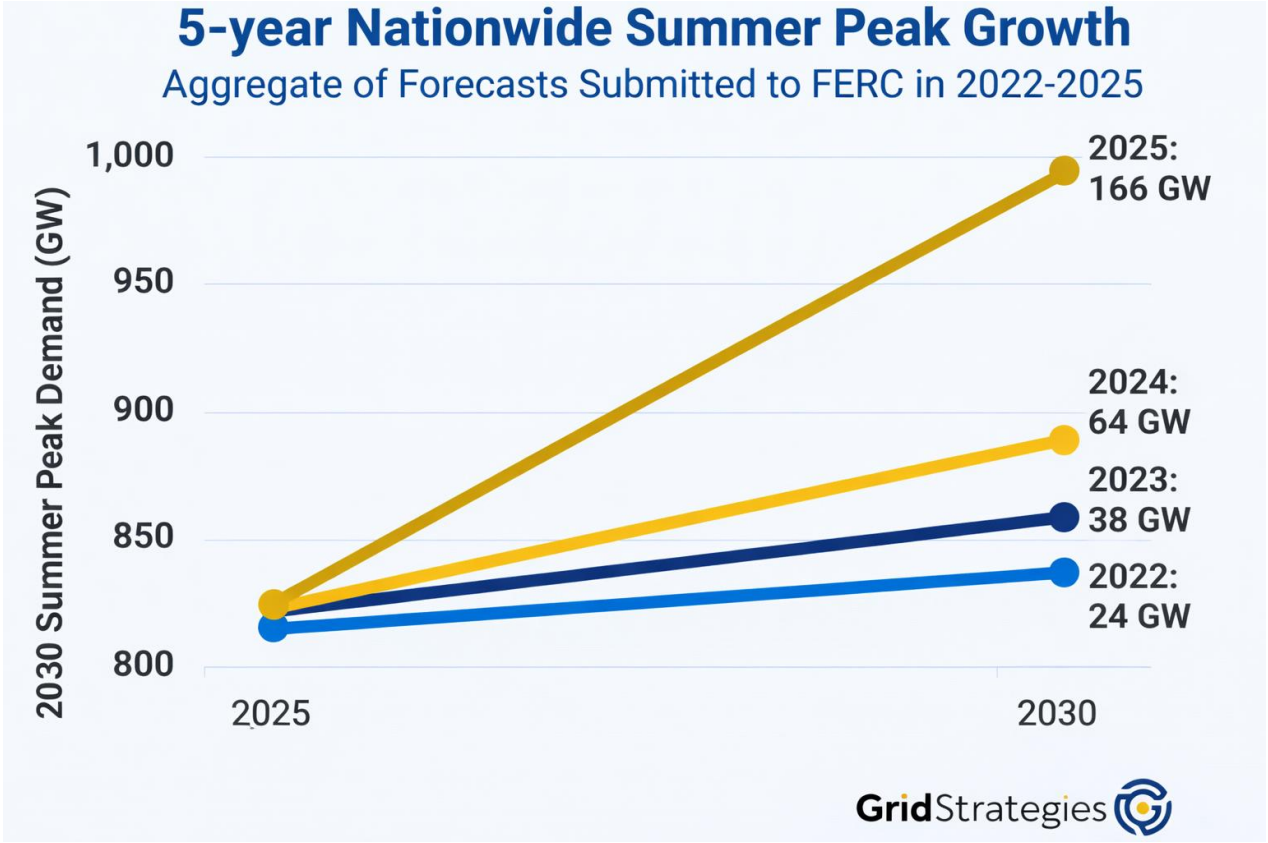
Rapid Load Growth



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Planning Shifts

Traditional Approaches

- Least Cost
- Capacity Planning focus
- Primarily Thermal Generation
- Moderate to slow load growth

New Considerations

- Risk considerations
- Policy considerations
- Rapid load growth
- Variable Energy Resources
- Storage adoption
- Extreme weather
- Transmission constraints
- Fuel supply limitations
- Distribution integration

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North Carolina CPIRP and ISOP

- Carbon Plan and IRP – filed every 2 years
  - Aligns IRP with NC Carbon Targets
  - Maintain or improve system reliability
  - 70% by 2030 and carbon neutral by 2050

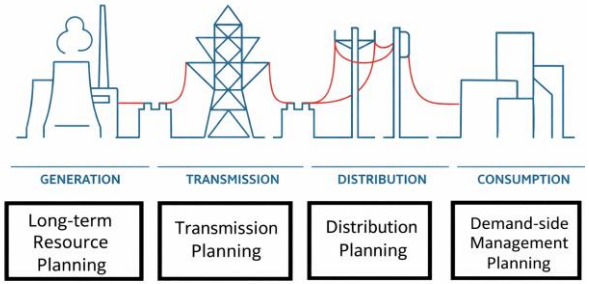

Figure 1. Power system domains included in the ISOP framewo

- Integrated System Operations Plan
  - Framework to optimize Generation, Transmission, Distribution and Customer Solutions
  - Non-Traditional Solutions (DERs, storage, customer programs)
  - Morecast – hourly distribution circuit level forecasts
  - Stakeholder driven

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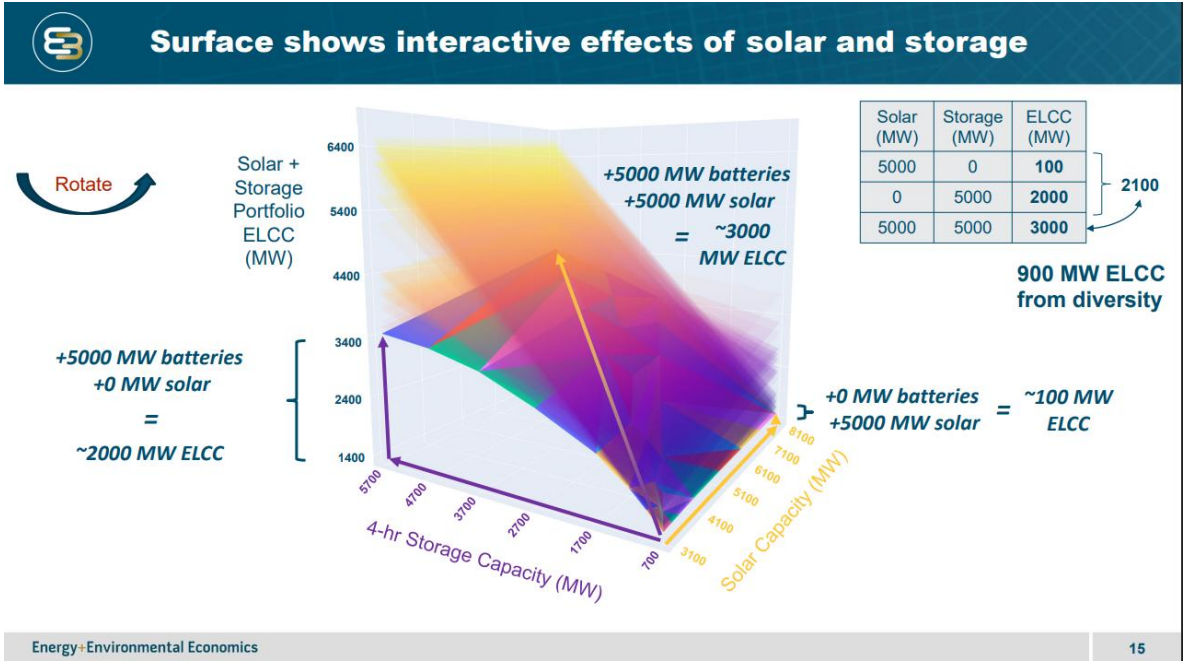
NV Energy

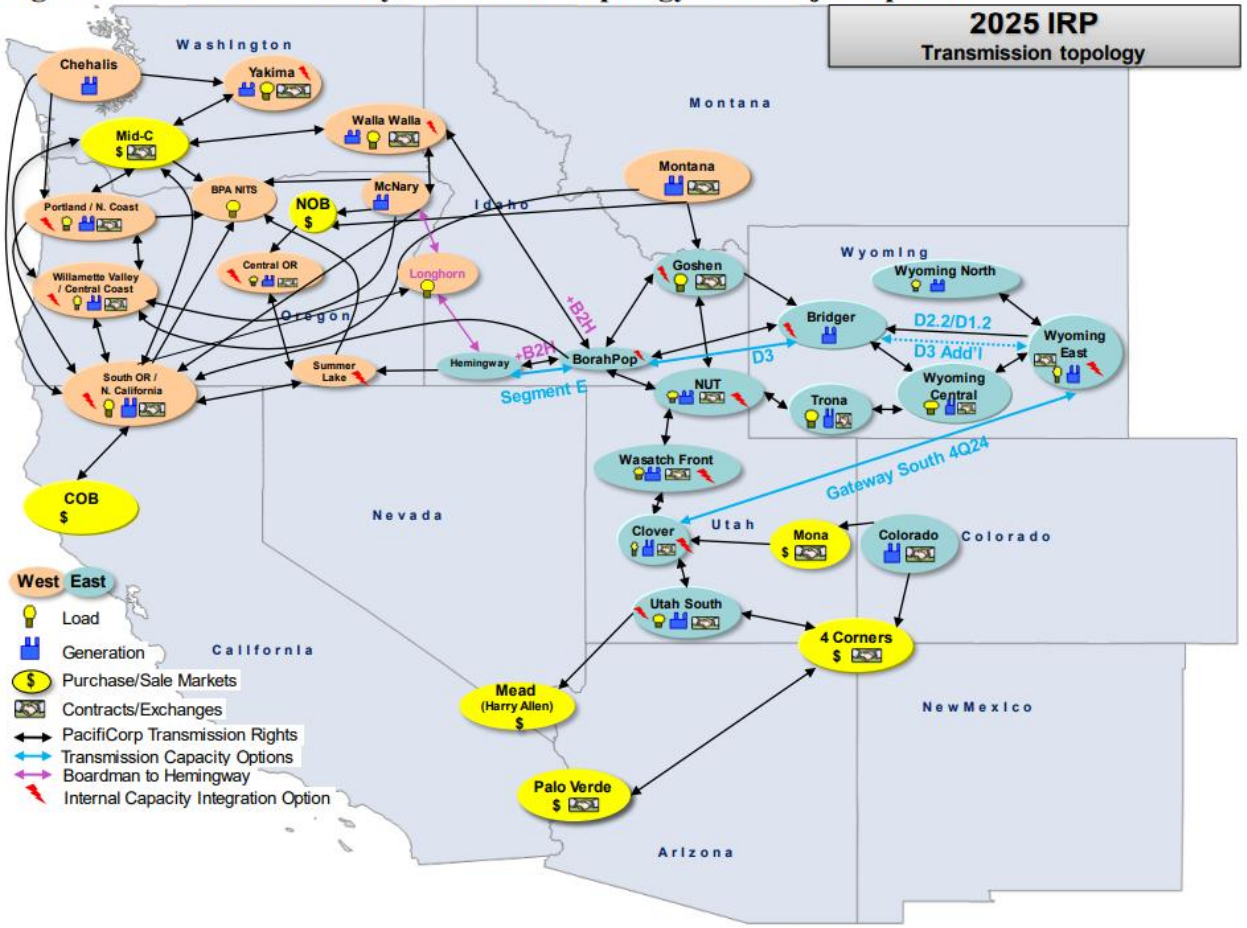
- ELCC Surface
  - Diversity Benefits
  - Saturation impacts
- Distributed Resource Plan
  - First DRP 2019
  - Walk-jog-run
  - Hosting Capacity Analysis



Pacificorp

- Large Geography
- Many Transmission options
- Iterative Capacity Expansion and Production Cost Model approach

Figure 8.3 – Transmission System Model Topology with Major Options

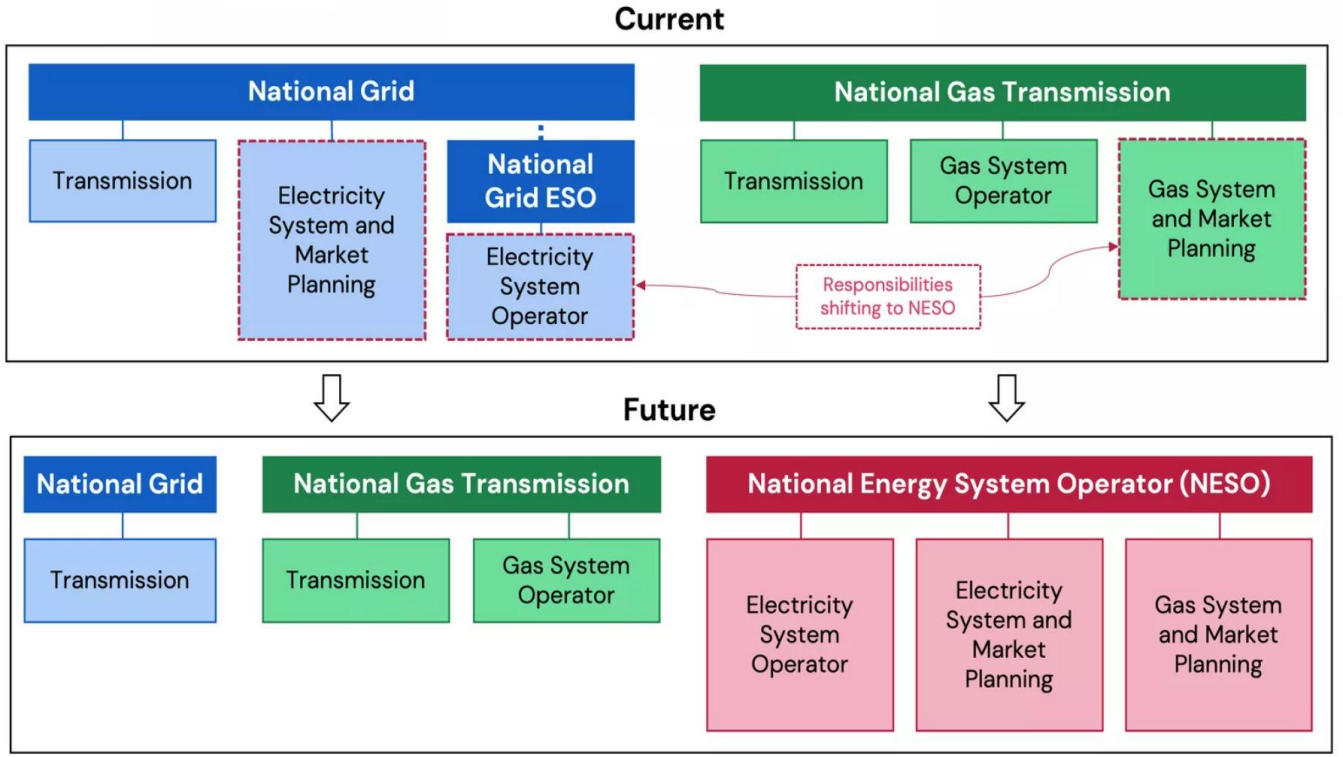


HECO Integrated Grid Planning (IGP)

- Process launched 2018, accepted 2024
- 100% renewable by 2045
- Generation, transmission, distribution
- Emphasize stakeholder engagement
- Iterative multi-tool process

GB Coordinated Gas and Power

- Institutional Structure
  - NESO – Electricity system operator
  - NGT – gas transmission operator
  - Ofgem – regulator
  - Net zero by 2050



Source: Modo Energy
Notes: Planned changes to ownership and responsibilities under the Future System Operator proposals

MODOENERGY

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Thank You

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