

RESOURCE ADEQUACY

RESOURCE ADEQUACY REVISITED

Power-systems are dependent on **weather**, with reliability increasingly impacted by “common mode failures”.

Short-term **operational flexibility** is needed to ensure reliability. However, traditional RA tools and metrics do not represent many physical, engineering, and operational details that impact flexibility, nor do they identify the location and severity of shortages.

Traditional reliability tools and metrics are not sufficient measures of adequacy in a rapidly evolving grid. Trade-offs imposed on planners and operators require understanding of both **reliability and economic impacts** of shortages.

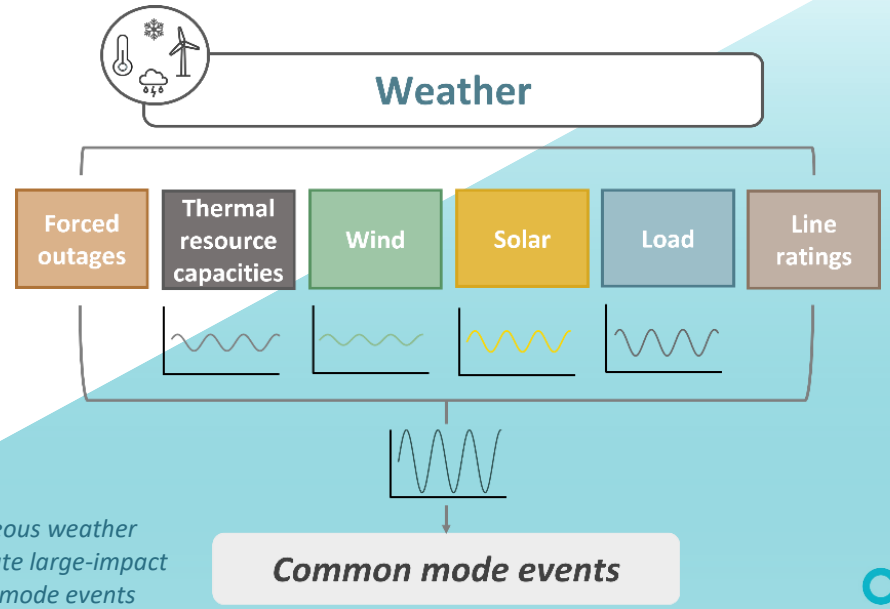
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WEATHER

Adequacy must evaluate **correlated impacts** of weather on an increasing range of attributes, including load, solar power wind power, thermal generator limits, transmission capacity, and forced outages rates.

OPERATIONAL FLEXIBILITY

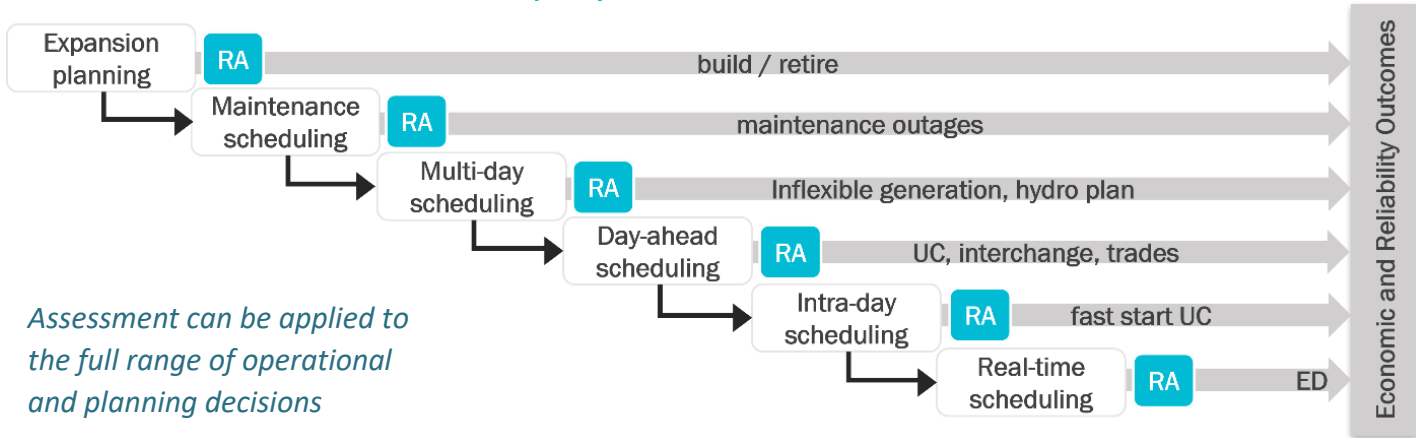
System operations, maintenance scheduling, asset valuation and other processes are increasingly dependent on policies and metrics needed to ensure reliability. Reliability impacts of investment and operational decisions need to be evaluated **in all time frames** and on a continuous basis.



Simultaneous weather impacts create large-impact common-mode events



Adequacy of decisions across time



CAPABILITIES

IMPACTS

- Physically accurate models with full security analysis
- Operational impacts of forced outages and weather
- Fast simulation
- Application to range of planning and operational decisions
- Economic assessment of shortages
- Shared data sets (resource adequacy, capacity expansion, maintenance scheduling, and production cost modeling)



- Locational and economic impacts of all resources
- Quantify value of storage, variable generation, transmission and load
- Real-time operational assessment of risk and operator intervention
- Quantify value of flexibility, forecasting, changing processes
- New metrics for system adequacy and impact of shortages
- Simplify data management
- Consistent results across business processes

