



Monitoring Report SD-9: Resource Planning System Management Committee August 11, 2020

Javier Fernandez, Vice President – Financial Services & CFO

SD-9 Resource Planning

Strategic Directive

The Board of Directors recognizes that the District will have to adapt to the rapidly changing electric utility business environment. The OPPD resource planning process will provide the resources and analytical capability to adequately assess OPPD's Integrated Resource Portfolio (or Supply and Demand Portfolio) to ensure reliable, competitive, cost-effective and environmentally sensitive service for our customers.

To attain this goal, OPPD shall:

- Periodically assess, for strategic and integrated resource plans, OPPD's mix of generation assets, demand-side management programs, purchased power agreements and renewable energy resources.
- Utilize multiple scenarios to properly evaluate the range of risks posed by varying future assumptions such as, but not limited to fuel costs, economic growth, regulations and emerging technologies.
- Ensure all integrated resource strategic plans support and align with OPPD's Strategic Directives.

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- **Resource Planning Process**

- OPPD maintains a dedicated staff who facilitate both long term and short term “Resource Planning”.
 - Short Term – Used to derive near-term (usually 5 years) worth of expected load, fuel budgets, generation volumes, off system sales as well as fuel and purchase power. Rarely, if ever, are long term resource decisions made during this short term planning as the outputs are used primarily for the annual Corporate Operating Plan
 - Long Term – Used to derive the same outputs as the Short Term version but on a much longer duration and usually involve longer term resource recommendations.
- OPPD uses sophisticated and robust platforms while resource planning including AURORA for resource planning and Itron for load forecasting.
- OPPD's process incorporates robust supply and demand side resource evaluations which balance competitive, cost-effective and environmentally sensitive service.

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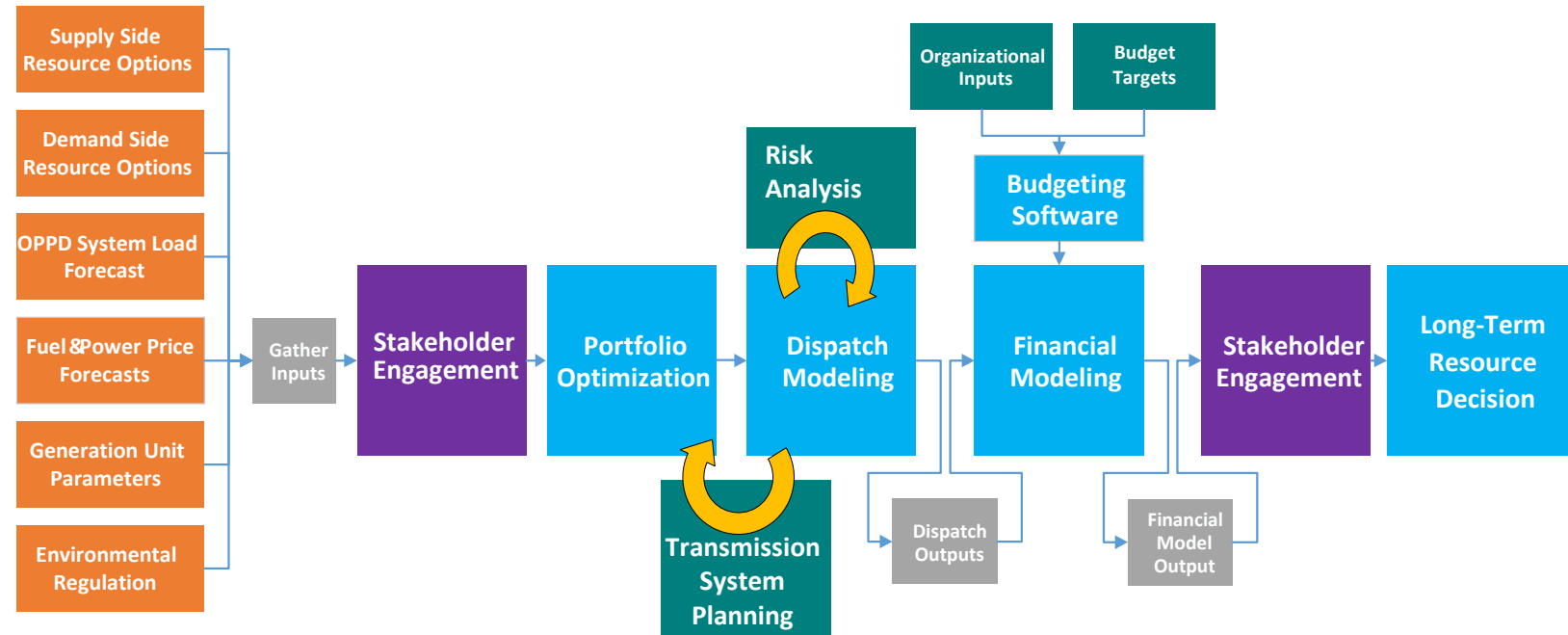
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- Short Term resource planning is completed annually.
- Long term resource planning can be triggered by a variety of diverse circumstances, including but not limited to:
 - Meaningful changes to Southwest Power Pool accreditation policy
 - System reserve margin changes
 - Alterations of current environmental regulations
 - Proposed new environmental regulations
 - Bulk Electric System reliability/resiliency changes
 - Western Area Power Administration filings
 - Significant load changes
 - Combination of some or all of the above

Long Term Integrated Resource Planning Process



Periodically assess, for strategic and integrated resource plans, OPPD's mix of generation assets, demand-side management programs, purchased power agreements and renewable energy resources.

- **Power with Purpose Highlights**

- First-time evolution for the simultaneous optimization of transmission and generation planning while balancing the tradeoffs for the reliable, competitive, cost effective, and environmentally sensitive.
- Included the development of an innovative efficient-frontier framework to simultaneously optimize the multiple objectives of OPPD's mission: affordable, reliable, and environmentally sensitive.
- Process resulted in 70 million potential resource combinations.
- Robust supply and demand side options were present.
- Effort is critical to realize an anticipated 80-90% reduction over current North Omaha emissions.
- Outcome is expected to posture OPPD to embrace decarbonization in the coming years.

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Analysis Objective/Technologies Evaluated

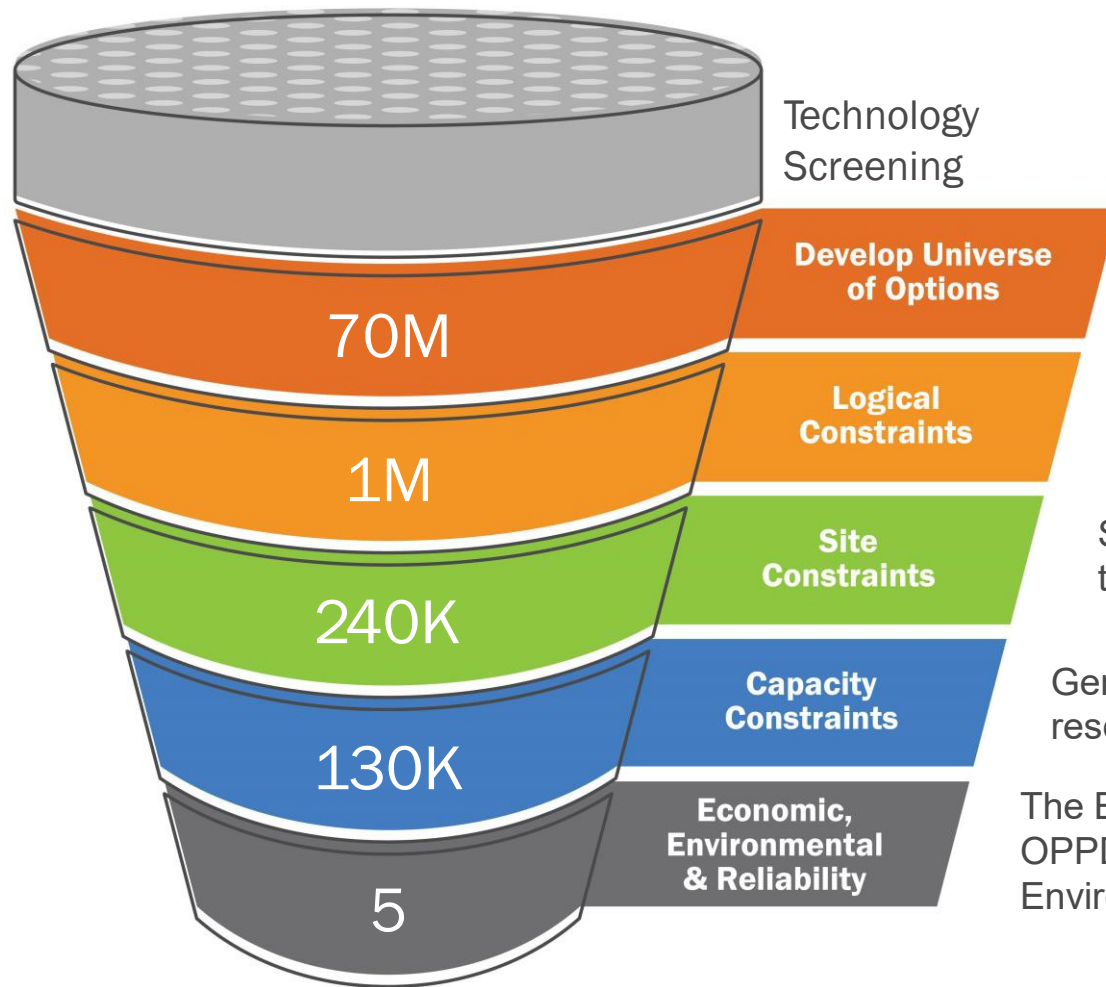
New Generation & Storage	Existing Assets	New Voltage Support Resources	New Demand Side Resources*
Combustion Turbines	North Omaha 4-5 Natural Gas	Synchronous Condensers	Demand Side Management: C&I Curtailable Cool Smart Residential Thermostats School Kits Online Products SMB Load Management C&I Prescriptive C&I Strategic Energy Management ECO 24/7 HVAC Smart Rebate Certified High Performance Homes C&I Custom C&I New Construction Small Business Direct Install Residential Lighting Income Qualified
Reciprocating Engines	North Omaha 4-5 Coal	Static VAR Compensators	
Photovoltaic Solar	North Omaha 4-5 Retirement	Transmission Expansions	
Battery Storage	North Omaha 1-3 Sync Condensers	Statcoms	
Combined Cycles	North Omaha 4-5 Sync Condensers	Capacitor Banks	
Wind Turbines	North Omaha 1-3 Natural Gas		
New Nuclear/ Coal Baseload	FCS Sync Condenser		
			More than 4,000 other measures evaluated

- Analysis objective to balance affordability, reliability and resiliency and environmental sensitivity.
- OPPD's analysis considered many supply, demand, and transmission resources.
- Technologies in grey were screened out due to significant cost premiums, comparative ineffectiveness, or failing to meet technical or resiliency requirements.

*Demand Side Management example programs were considered in a detailed analysis and will reduce OPPD's resource requirements to the extent that they are achieved and realized.

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Modeling Approach*



The universe of options is created by all combinations of technologies, sites, and sizes.

The logical constraints eliminate physically infeasible options – such as a North Omaha 1-3 being both retired and operating on natural gas simultaneously.

Site constraints limit the total amount of resources at any one location to enhance resiliency and leverage existing transmission infrastructure.

Generation capacity constraints ensure that there are sufficient resources to meet customer demands throughout the year.

The Efficient Frontier identifies combinations of resources that best achieve OPPD's competing objectives of Affordable, Reliable/Resilient, and Environmentally Sensitive and will be confirmed post RFP.

*Modeling approached utilized Aurora, PSSE and supplemental tools

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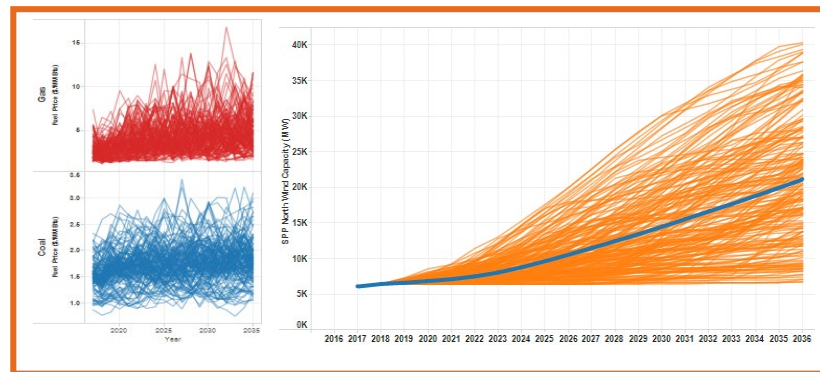
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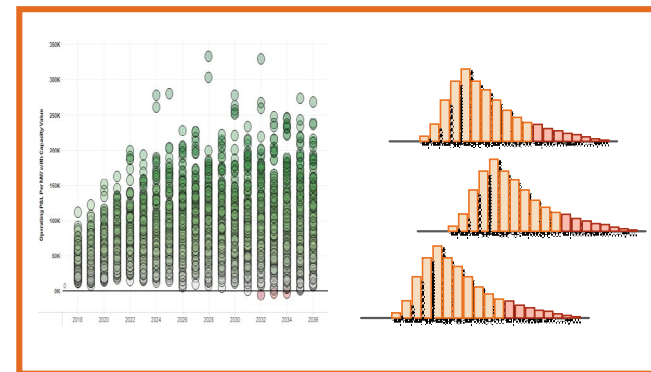
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- As appropriate, OPPD's processes use a range of risk analysis techniques including stochastic and scenario analysis, varying inputs across ranges of potential outcomes.
- These simulations can tell us how potential portfolios will fare in unknown future states including the impacts to both expected generation volumes and emissions, overall cost, and financial risk.

1. Market Assumptions



2. Portfolio Results



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The planning process considers the diverse and unique requirements of the following Strategic Directives and embraces the competing interests and tradeoffs that must be made when making resource decisions:

- SD-2: Rates
- SD-4: Reliability
- SD-5: Customer Satisfaction
- SD-7: Environmental Stewardship
- SD-9: Resource Planning
- SD-11: Economic Development
- SD-13: Stakeholder Outreach and Engagement
- SD-15: Enterprise Risk Management

Recommendation

- The System Management Committee has reviewed and accepted this Monitoring Report for SD-9 and recommends that the Board find OPPD to be sufficiently in compliance with Board Policy SD-9.