Value of Solar in CRP Portfolios and Need for Proactive Transmission Planning

NCUC CAROLINAS RESOURCE PLAN TECHNICAL CONFERENCE

PRESENTED BY

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ON BEHALF OF

Carolinas Clean Energy Business Association (CCEBA)

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Brattle

Speaker Information

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11 years of experience in utility and electric power industry planning and regulatory analysis, including utility resource planning, transmission planning, and generation interconnection processes

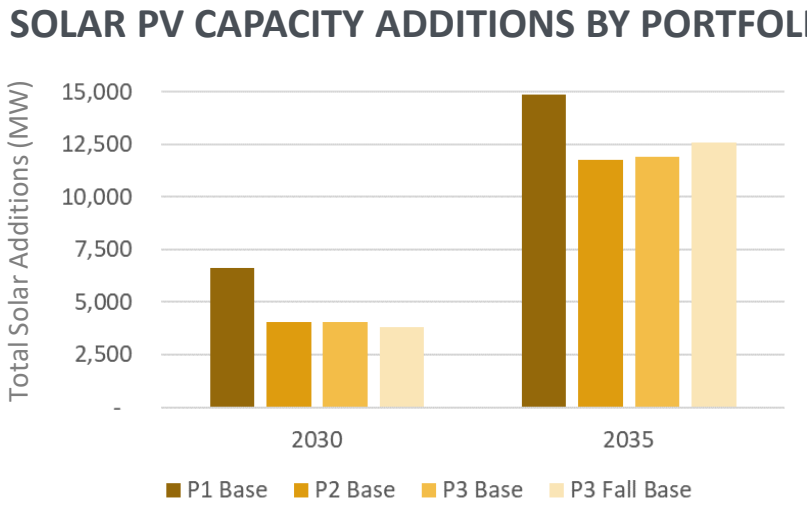
Since 2021, analyzed Duke's future resource needs to reliably serve load and achieve HB951 objectives, and participated in the 2023 and 2024 CTPC transmission planning studies

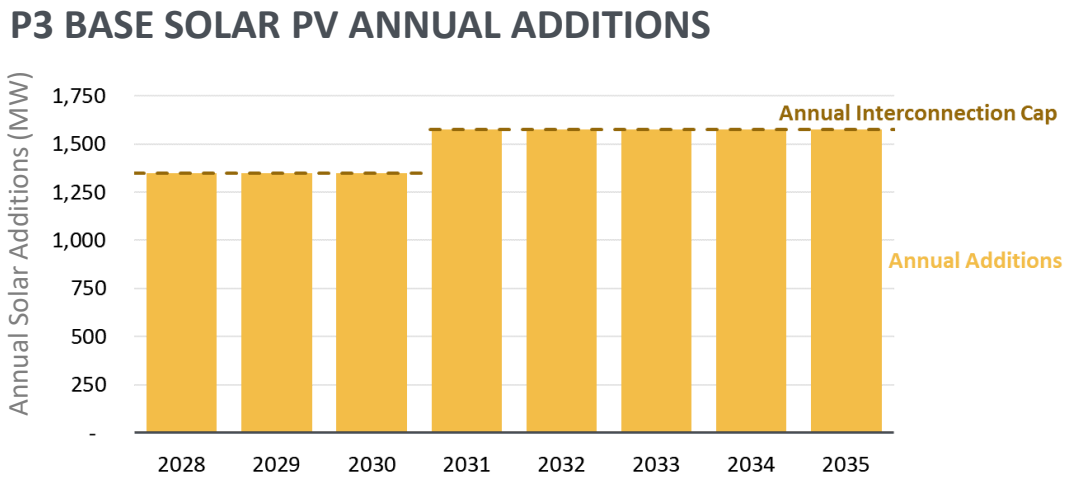
Supported transmission & generation developers, utilities, state regulators, and RTOs with transmission planning processes in ERCOT, SPP, MISO, NYISO, PJM, CAISO and ISO-NE

Evaluated generation interconnection across the country

Solar & Storage are Cost-Effective Components of all CPIRP Portfolios

- EnCompass selects least-cost resources to reliably serve load and achieve HB951 goals
- 2035 portfolios include solar and storage, accounting for recent cost increases
  - **Solar**: 11,800 - 14,900 MW
  - **Storage**: 4,300 – 6,700 MW
- Value highlighted by solar additions up to the Duke-specified interconnection limit
- Solar is selected because it is the least-cost source of zero-carbon generation; only clean resource being built in Duke's system

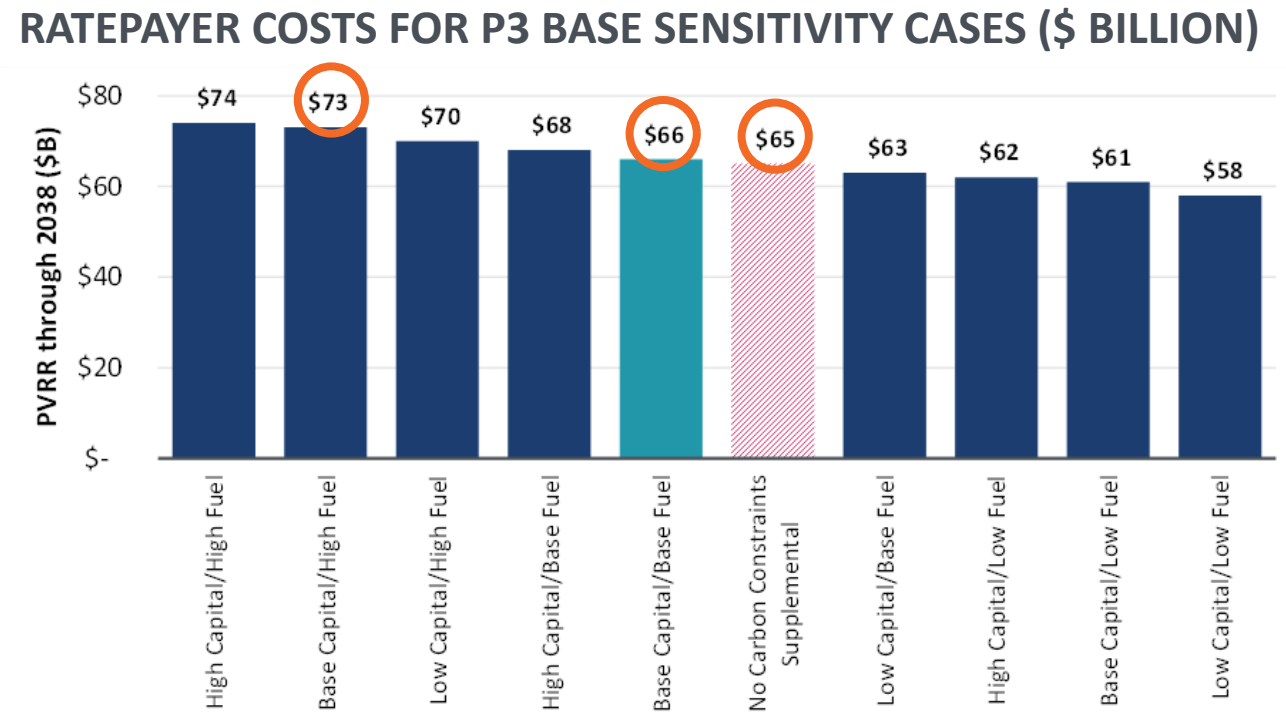




Solar Provides Ratepayers a Hedge against Volatile Gas Prices

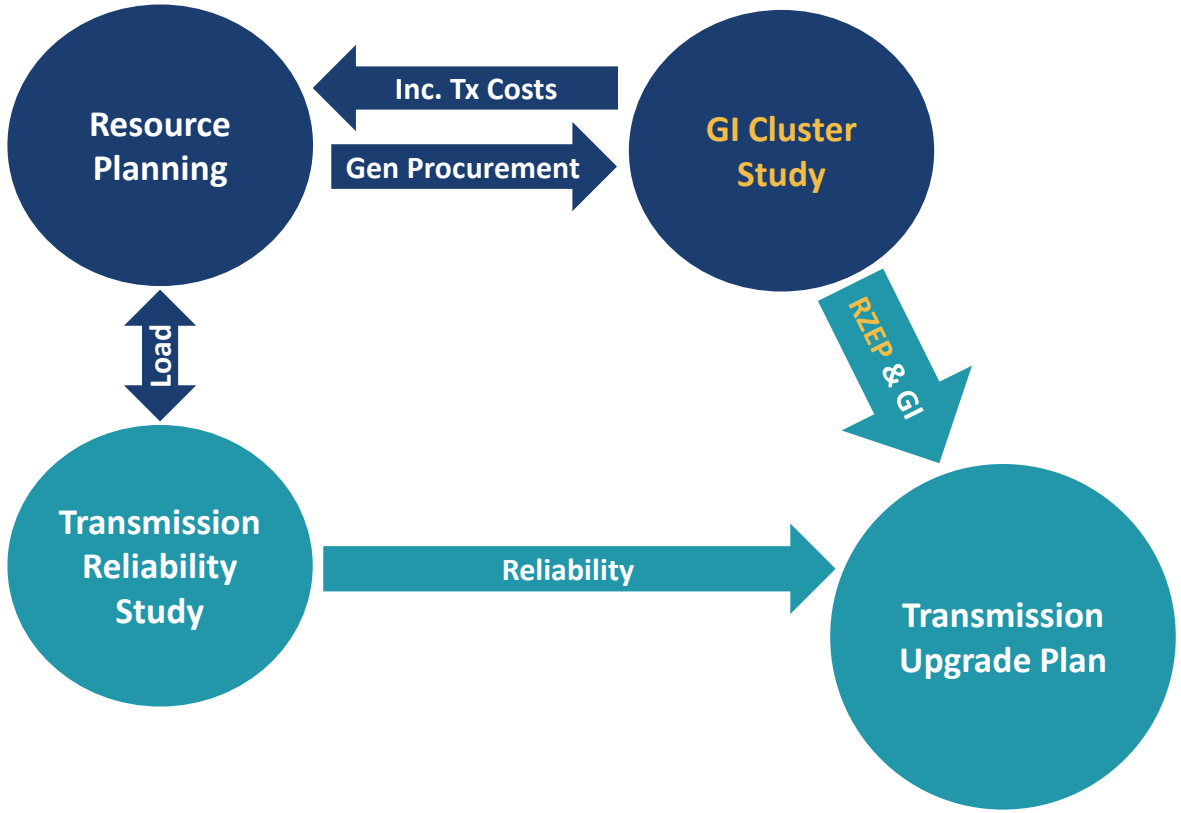
Solar and other clean resources provide ratepayers a low-cost hedge against ratepayer cost volatility due to fluctuations in natural gas commodity prices

- Resources built to achieve HB951 GHG reductions increase costs by $1B (1.5%) over *No Carbon Constraints*
- *High Fuel Cost* case increases costs by $7B, demonstrating scale of ratepayer exposure to gas prices
- *No Carbon Constraints* increases gas burn compared to P3 Base, further increasing ratepayer exposure to high gas prices

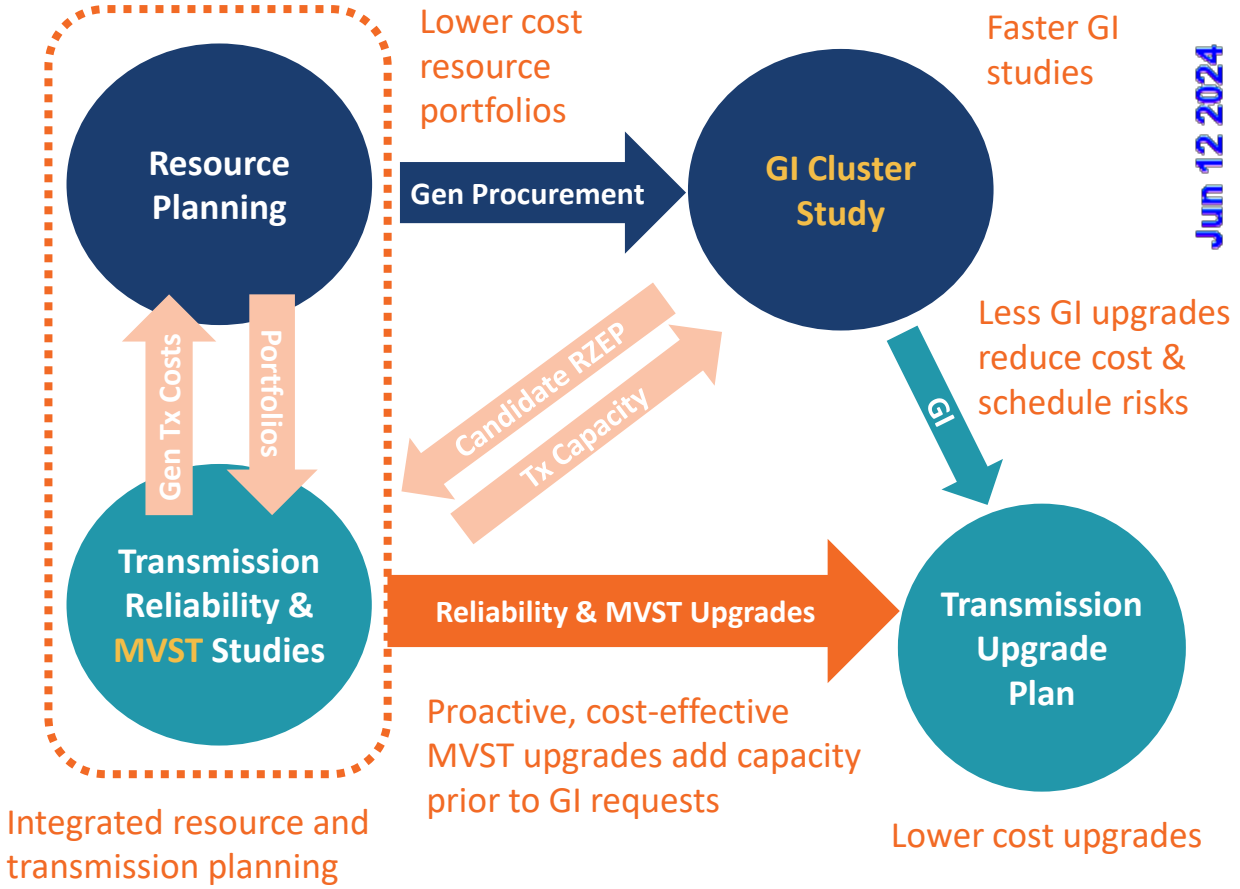


Proactive Transmission Planning is Key to Reducing Costs

Current Process without Proactive Transmission Planning



Updated Process with Proactive Transmission Planning



Recommendations for MVST Process

1. **Proactively plan for future generation and load** by incorporating realistic projections of anticipated generation mix, load levels, and load profiles over lifespan of upgrades
2. **Account for full range of transmission project benefits** and use multi-value planning to identify upgrades that cost-effectively address all categories of needs and benefits
3. **Address uncertainties and high-stress grid conditions** explicitly through scenario-based planning
4. **Use comprehensive transmission network portfolios** to address system needs and cost allocation more efficiently than a project-by-project approach
5. **Jointly plan across neighboring interregional systems** to recognize regional interdependence, increase system resilience, and take advantage of scale and geographic diversification benefits

Reports on Transmission Planning and Benefit-Cost Analyses