

NATIONAL COUNCIL ON ELECTRICITY POLICY Annual Meeting 2019 Evolving Transmission, Distribution, and Customer System Coordination

> Wednesday, September 11 – Thursday, September 12 Austin, Texas

State Examples: Advancing Transmission, Distribution, and Customer System Coordination

Hon. ToNola Brown-Bland, Moderator Mark Oliver Constance McDaniel Wyman



Integrated System & Operations Planning (ISOP) Overview National Energy Policy Council September 11, 2019 The Integrated System & Operations Planning (ISOP) vision is a planning framework that optimizes <u>capacity</u> and energy resource investments (MW/MWh) across Generation, Transmission, Customer Delivery and Customer Solutions.he framework will address:

- Operationally feasible plans while accommodating rapid renewable growth
- Enhanced modeling to value new technologies such as energy storage, electric vehicles, and intelligent grid controls/customer programs (non-traditional solutions for Distribution and Transmission)
- Ability to evaluate different asset portfolios across a broader range of potential future scenarios



Emerging grid and customer-side technologies will impact supply/demand balancing



Existing Planning Paradigm Vs. New Integrated Planning Approach



Non-traditional solutions studied to address system needs

What is Driving the Change?



Rapid drop in PV costs; rate of decline is slowing.

Storage costs expected to drop 40% by 2025, but economics are still challenging.

Solar costs appear attractive, but solar does not contribute effectively to the winter capacity needs that factor heavily into the economics of Carolinas resource planning.

The Pace of Solar Interconnections Continues to Increase

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Regulated Solar - Cumulative Number of Facilities Connected

Net Metering (NM) / Qualifying Facility (PP)

Over 40,000 solar interconnections in Duke's territories since 2012

The trend of solar growth is continuing and will become increasingly impactful.

What does this mean for Distribution and Transmission Planning?

24 Hours of Circuit Load - With vs. Without Solar

3000



Utility storage can help address intermittency and reverse flow challenges. Detailed hourly analysis is needed to assess costs and benefits for storage applications.

EV charging can introduce localized impacts on Distribution & Transmission Planning



Loading Example for Tesla Fast Charging Station

EV's are critical for reducing GHG, and also put downward pressure on electric rates, but can pose planning challenges in high penetration areas:

- Increase load volatility
- Concentrate large new delivery points
- Introduce short lead times for upgrades
- Accelerate circuit capacity needs



Illustration – Last Mile Logistics Customer

- Existing facility load ~ 1 MW
- 50 Medium-Duty Package Delivery trucks
 - 15 kW each (overnight)
- 20 electric semi-trucks
 - 2 "mega-chargers" @ 1-1.5 MW each (day)
 - 5-10 "slow" chargers @ 100 kW (night)
- Vehicles arriving in late 2020
- Expected load increase ~ 3-3.5 MW
- Circuit capacity ~ 3.5 MW
- Total vehicles on site (if full electrification)
 - 60 Semi-trucks
 - 200 Delivery trucks



ISOP High Level Process Flow



Questions?





Appendix Materials

How Does ISOP Relate to the Grid Improvement Plan?



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