Competitive Policy Agreement Working Group (CPAWG)

Analysis Request to PJM

The CPAWG assisted by RMI and Brattle staff has developed these proposed scenarios and corresponding outputs to inform PJM's modeling and analysis of various clean procurement market constructs. CPAWG believes this information will inform its position as these discussions advance, both in the CPAWG and CAPSTF.

Scenario	Assumptions & Desired Outputs
All	*Outputs* • Price and total procurement costs of clean attributes, region-wide, by product, and by state and/or other voluntary buyer • Energy market and capacity market consumer costs region-wide and by state • Societal costs (production and going-forward investment), region-wide • Resource entry/exit, region-wide and by state, technology type • GHG emissions, region-wide • Is reliability requirement met? (Y/N) • Are state clean energy goals met? (Y/N)
1. Status quo Model all state policy goals (RECs, ZECs, storage, offshore wind, DERs, DR etc.) for 2030.	*Assumptions:* Provide a summary of policy assumptions by state for OPSI CPAWG review and adjustment. Include a realistic level of "friction" (transaction costs, etc.) and non-coordination as associated with the lack of a regional marketplace. OPSI suggests 5 % would be an appropriate placeholder for this value. *Outputs: See "all" above*
2. Regional clean attribute market scenarios A regional market for clean energy attribute credits ("CEACs") could be modeled in several different ways; we recommend the following sub-scenarios: 2A. Market for multiple state REC products: Each of the various state RPS products (Tier I RECs, solar RECs, in-state RECs, etc.) are procured through a central auction. Benefits of the regional marketplace modeled based on removing "frictions" from Scenario #1. 2B. Co-optimization with capacity market: Same as #2A, but include realistic assumptions regarding improved resource selection due	*Assumptions* • Market efficiencies including lower transaction costs and added transparency eliminate "frictions" and reduce clean attribute procurement costs 5% compared to Status Quo • Use historical analysis to determine the volume of renewable supply that has not offered/cleared in the capacity market, and carry this assumption into the regional attribute market scenarios • Voluntary demand participation: Use a sloping demand curve with target quantity +/-5%. For

to co-optimization between capacity and REC procurements (rather than time-sequential FCEM, which precedes capacity auction). 2C. Market for a common REC: One REC product that reflects the overlap in state Tier I REC resources (i.e., wind, solar, geothermal, qualifying biomass and methane) is procured through a central auction; assume existing contracts are honored (e.g., OSW already selected); all other REC & ZEC products continue to be procured as today. 2D. Add Voluntary Demand for New Region-wide REC product: Same as #2C, but add 10%, 20%, and 30% voluntary demand for regional REC product (nuclear not eligible). 2E. Add Voluntary Demand for Region-wide CEAC product: Same as #2C, but add 10%, 20%, and 30% voluntary demand for regional *CEAC* product (renewable and nuclear are both eligible).	cost allocation purposes, report costs allocated to voluntary buyers separately (agnostic as to whether buyers are cities, corporates, or other consumers) *Outputs: See "all" above, plus:* • Compare regional clean attribute market simulations with different commitment periods for cleared resources (e.g., 1 year, 3 year, 7+years) and assess impact on outcomes. • Model a version of a regional clean attribute market in which there is a must-offer requirement into the capacity market for resources that participate in the clean attribute market; assess how outcomes differ.
3. Clean capacity constraint Addition of a tranche for clean capacity within existing RPM, where eligible resources include renewables, storage, EE, DR, and nuclear Otherwise identical to #1 (Status Quo)	*Outputs: See "all" above, plus:* • Note impact on capacity prices and consumer costs for states/LDAs purchasing clean capacity tranche as well as those that are not • Model scenarios with lower/higher levels of clean capacity requirements. "Clean capacity" costs are allocated only to those states for whom the clean capacity has been procured.
4. Combo clean attribute market (MWh, renewable only) and clean capacity constraint (MW UCAP, all clean supply is eligible including renewable, DR, EE, battery, nuclear) This scenario would layer scenarios #2C and #3 together, reflecting a world in which states and other buyers can meet their goals through a regional attribute market and/or clean capacity constraint.	*See "all" above, plus:* • Note impact on capacity prices for states/LDAs participating in clean capacity market as well as those that are not • Note any variation in clean procurement costs between this and scenarios 2, 3
5. Option for state-specific variations of the above Individual states may request state-specific scenario analysis.	*Will focus on states' specific questions and scenarios*