A Path Forward for the Resource Adequacy Senior Task Force

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December 22, 2022

Overview

1. Review issues in Sustainable FERC Coalition high-level design concept
    1. First posted: October 31, 2022
    2. Prior presentations of key concepts:
        1. RMI - Grant Glazer – Oct. 2022 presentation
        2. Sustainable FERC - Tom Rutigliano -- Sept. 2022 presentation.
2. Factors for the RASTF to consider in deciding priorities
3. Suggested path forward

Definition of capacity product

- Capacity product is MW of UCAP. UCAP is defined as the resource adequacy value of a perfect resource.
- Capacity market is an instrument to ensure resource adequacy at the lowest cost to consumers and should not exclude any resource that can contribute to resource adequacy. Product definition should not reflect arbitrary qualifications and should set reasonable expectations for performance by different resource types.
- The capacity product is an obligation (by sellers) and expectation (by consumers) that capacity resources will be available consistent with the assumptions used to determine their UCAP.
  - Fungibility means that any MW of UCAP can be exchanged for any other without a resource adequacy impact, subject to locational constraints. It does not mean that all resources are operationally identical.
  - The UCAP of any resource will be a function not only of that resource's individual characteristics, but of load shape and other resources in PJM's fleet.
- With this approach, the accreditation, obligations, and payment for capacity resources are all based on a consistent metric.

Reliability risks and risk drivers (KWA #2)

- Reliability risks attributable to supply resources should be allocated to the supply resource (i.e., reflected in accreditation) wherever possible, and as consistently as possible across resource types.
- Resource adequacy models should better account for extreme weather events, including winter risk.
  - Extreme weather scenarios should be incorporated into both load and supply modeling; need for stakeholders to examine linkages to FERC extreme weather rulemaking docket.
  - Correlated fuel supply risks should be reflected in accreditation.
- Reduce incentives for risk arbitrage
  - Currently, units without secure fuel supply enjoy capacity payments as year-round resources. History (polar vortex and Winter Storm Uri) suggests that low-probability risks or windfalls do not discipline market behavior. This creates risk from resources that bet on no emergency happening (NERC cold weather reliability standards should also help here).
  - Require resources to either demonstrate firm fuel or accept a discounted UCAP reflecting the risk of unavailability during low probability winter events.

Procurement metric and level (KWA #3)

- Procurement targets should decrease as supply-side risks are moved into accreditation, and would decline further with possible move to marginal ELCC.
- We agree with PJM that the magnitude and duration of outage events is important and that expected unserved energy is a good measure.
  - Solicit input from state regulators as key partners in determining acceptable risk levels.
- Load forecast risk remains costly. Manage this through later BRAs and/or deferring part of capacity procurement (e.g., reintroduce short-term resource procurement target). See Brattle recommendation in 2022 Quadrennial Review.

Qualification and Accreditation (KWA #5)

- Ensure that supply risks that are under management control are allocated to the supply resource in a way that is as consistent as possible across resource types.
- Broad agreement among stakeholders that PJM should extend ELCC framework to all resource types to better capture key reliability risks:
  - Weather-related correlated outages or ambient derates
  - Fuel supply correlated outages
- Recognition that for all resource types, class-based ELCC methodology does not capture the diversity in unit performance (for some classes more than others)
  - Reflecting the diversity in individual unit performance in accreditation is important to incentivizing better performance, including weatherization & fuel supply arrangements.
  - Uncorrelated outages should not be included in ELCC, but should remain in eFORd and be the responsibility of the supply resource.

Performance assessment and obligations (KWA #4 & #6)

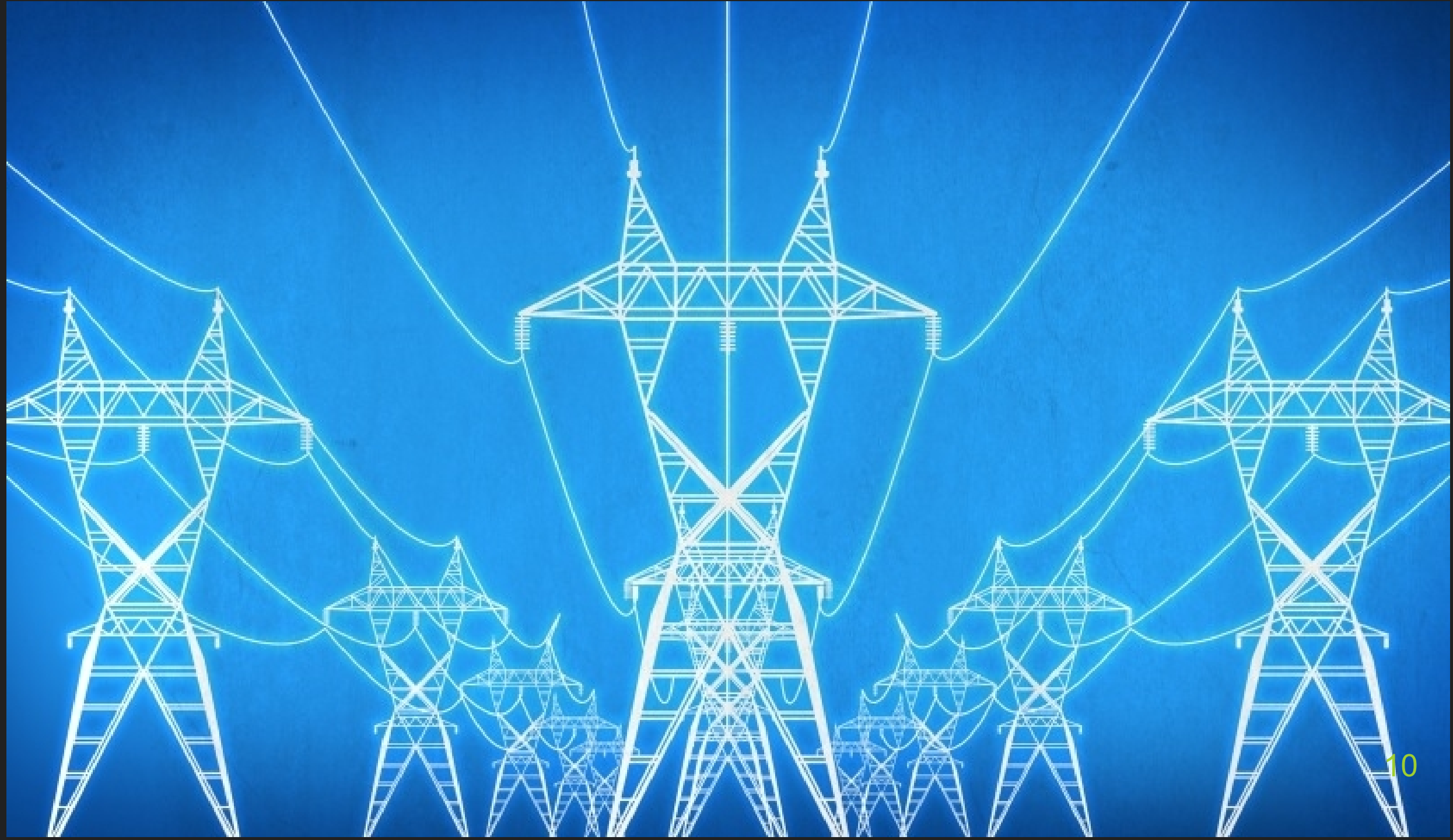
- We agree with PJM and others that increasing the frequency and predictability of assessment intervals is needed to protect against “cardboard box” problem. However, this would amplify the double penalty ELCC resources currently face, and so requires that resources’ obligations match the assumptions used in accreditation.
- UCAP value will reflect class-level assumptions captured in the ELCC method as well as unit-specific adjustments.
  - Risks that are already reflected in their ELCC discount from nameplate do not result in penalties (other than if the owner fails to follow Good Utility Practice, is negligent or deceptive, etc.).
  - However, risks that are reflected in the unit-specific adjustment lie on the resource.
  - A challenge remains in how to handle risks that are both correlated and under management control (e.g., winterization).

Enhancements to the capacity procurement process (KWA #7)

- Shorten the auction's forward period
  - Makes ELCC determinations more accurate since the resource mix is more certain
  - Reduces load forecast error
- Stakeholders should consider whether LSEs should be permitted to procure less than 100% of their share of the reliability requirement through RPM and instead demonstrate compliance through bilateral contracts (e.g., partial FRR or enhanced self-supply options)
  - Would serve as a possible mechanism for states or private buyers to meet clean capacity requirements

Seasonal capacity construct

- Variations in seasonal supply, demand, risk, and transmission all argue for a seasonal market. Earlier materials by PJM and stakeholders show the potential for large savings from better risk allocation across seasons.
- Changes in load shape due to extreme weather and electrification trends point to diverging seasonal needs.
- Some challenges:
  - Seasonal markets may eliminate the off-season excess capacity currently relied on to cover resources on maintenance.
  - Details of determining ACR and avoiding excessive uplift payments.



We propose a two-phased approach to completing work in the RASTF

- PJM would like reforms to be in place for 2027/2028 BRA, which would require stakeholder votes in the 3rd quarter of 2023.
- Six to eight months is not a lot of time for the scope of issues stakeholders have identified.
- We propose working on issues in two phases, the first to be filed in time for the 2027/2028 BRA, and the second to be voted on sometime in 2024.
- Remainder of this presentation discusses prioritizing the major work items.

Prioritizing Work

Issue	Impact	Technical Difficulty	Notes
ELCC for all	Improves reliability and reduces hidden subsidies	Medium	Addresses supply risk allocation issues, and includes corresponding changes to auction parameters.
Seasonal market	Potential large cost savings	Hard	
Must offer requirement	Mitigates market power	Easy	Linked to capacity performance obligations.
Capacity performance obligations	Removes market distortion	Medium	
Marginal ELCC	Little in short term; more accurate long-term resource mix.	Hard	May have interactions with auction timing.
Auction timing and other process enhancements	Potential large cost savings	Easy	

Reallocating supply risks to supply is ready for immediate work

Broad stakeholder agreement and near-term reliability impacts support an immediate focus on reallocating supply risks to supply by reforming accreditation for the vast majority of PJM supply resources: thermal plants

- Consumers are currently paying for risks that should be borne by supply
- The status quo runs counter to the principles of competitive markets

Status quo accounting of reliability risks

Risks	Source	Accounting of Risk
Load Uncertainty	Demand	Demand-side (FPR)
Random Thermal Forced Outages	Supply (thermals)	Accreditation (EFORd)
Variable Resource Risks	Supply (e.g. wind/solar)	Accreditation (ELCC)
Limited Duration Resource Risks	Supply (e.g. battery)	Accreditation (ELCC)
Normal Variability in Random Thermal Forced Outages	Supply (thermals)	Demand-side (FPR)
Thermal Planned & Maint. Outages	Supply (thermals)	Demand-side (FPR)
Thermal Winter Correlated Outages	Supply (thermals)	Demand-side (FPR)
Ambient De-rates (Summer)	Supply (thermals)	Demand-side (FPR)

From PJM Aug 31 RASTF presentation

Seasonal market should be pursued

- Sustainable FERC believes that seasonal markets are both better positioned to meet future resource adequacy needs and offer potentially major cost savings.
- We acknowledge that not everyone agrees, and that many basic questions remain.
- The impact of a switch to seasonal on nearly every other KWA argues for committing one way or the other early on.
- Begin with a fact-finding exercise on seasonal markets:
  - Basic parameters of seasonal loads, supply differences, and non-summer CETO/CETL. Evaluate the benefits and implementation difficulty of dynamically allocating EUE across seasons, subject to annual constraints
  - What are the potential benefits of a seasonal market over an annual market? How might these benefits change over time with changing load characteristics (i.e., rapid electrification in certain zones), resource mix and fuel supply evolution?
  - What are the potential risks or complications of a seasonal market? (E.g., uplift payments to single season resources erode value, market power abuses)

Marginal ELCC is not urgent

- Penetrations of wind, solar, and storage are low enough in PJM that marginal and average ELCC values will be similar.
- ELCC resources do not currently appear to be marginal, so there should be little short-term difference on market clearing.
  - Note that the shift to marginal in itself doesn't change total physical procurement, only resource choice at the margin.
- Interconnection queue delays mean that this will not change quickly.

Marginal ELCC presents significant challenges for PJM's market

PJM will have to confront many design issues related to marginal ELCC that did not arise in NYISO, which is a single-state prompt market.

- Under Marginal ELCC, the reliability value of a fleet and the sum of its market UCAP diverge. NYISO's solution to this (1) only works if you know the cleared resource mix nearly exactly in advance; (2) is based on an ICAP market; (3) is clunky. PJM will need to develop a more robust (and hopefully more elegant) approach.
- As renewables and storage increase, the reliability surplus will grow to represent most of their reliability value. In NYISO, this surplus is simply allocated to load through the ICAP requirement. PJM will need to determine an allocation method to avoid states free-riding on others' investments.
- Under Capacity Performance as-is and Marginal ELCC, reliability will depend on capacity that nobody is obligated to deliver. NYISO avoids this because performance obligations are based on ICAP.
- As Marginal ELCC falls to very low values, the risk arises of an entire technology fleet dropping out of the market. This is bad in any case, and potentially catastrophic if planning/clearing processes don't adjust properly.

We propose a two-phased approach to completing work in the RASTF

Phase 1

Develop detailed design proposals to address highest priority issues

- ELCC for all
- Seasonal capacity markets

Stakeholder Voting Process

FERC Filing & Order

Phase 2

Education, fact-finding, and conceptual designs for issues that do not pose immediate reliability concerns and need significant development work

- Average vs marginal ELCC
- PAI and performance obligations

Jan 2023

July 2023

Dec 2023