AMERICAN CLEAN POWER

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Capacity Accreditation	)))	**Docket No. AD23-___000**

PETITION OF THE AMERICAN CLEAN POWER ASSOCIATION
FOR TECHNICAL CONFERENCE ON CAPACITY ACCREDITATION

Pursuant to Rule 207 of the Federal Energy Regulatory Commission's ("FERC" or "Commission") Rules of Practice and Procedure,[1] the American Clean Power Association ("ACP") respectfully requests that the Commission convene a technical conference ("Technical Conference") to explore ways to improve the accreditation of resources' capacity value in Independent System Operators/Regional Transmission Organizations ("ISO/RTO") regions with and without capacity markets, as well as in non-ISO/RTO regions.

I. Executive Summary

Our nation's electricity system is experiencing a remarkable, unprecedented transformation. In all regions of the country, the generation resource mix is evolving as multiple factors converge: new, clean energy resources are being deployed at a remarkable rate; legacy resources are retiring; and electricity demand is poised to increase due to data center growth and increased electrification. As new resources replace retiring ones, system operators and planners must proactively ensure the reliability and affordability of electricity. This is true under both normal operating conditions as well as severe weather events that may last several days.

To successfully address the reliability and cost implications of that transformation, the Commission's regulatory framework must continue to evolve in several ways to keep pace with those changes. As explained below, ACP strongly believes that capacity accreditation, which is a central pillar of both system planning and electricity market design, is one of the most critical areas in which progress is needed on a holistic basis. Although some regional variation is expected (as is the case for most planning and market design elements), capacity accreditation methodologies should share common goals and general approaches. But that is not the case

[1] 18 C.F.R. § 385.207.

today, as a wide variety of approaches are being developed across the nation and approved by the Commission on an *ad hoc* basis. Capacity accreditation rules are oftentimes applied inconsistently within and across resource types, making it more difficult to accurately assess national and regional resource adequacy and to make efficient investment decisions to maintain reliability.

The proliferation of widely varying capacity accreditation practices could have significant consequences over the next several years. The proliferation of regional proceedings on capacity accreditation, in conjunction with the Commission's *ex parte* rules, has largely prevented discussion or introduction of broadly applicable information that could assist future Commission proceedings on this issue. That constraint will continue to bind policy development going forward, because many regions are actively considering changes to their resource accreditation processes as the resource mix continues to evolve.

As explained below, a technical conference is necessary at this critical juncture for several reasons, including: (1) the absence of clear policy guidance from the Commission, or even an actionable set of first principles as a starting point, has led to a patchwork of capacity accreditation rules across the country; (2) establishing capacity accreditation rules through *ad hoc* proceedings under section 205 of the Federal Power Act ("FPA"), without meaningful regulatory guidance, poses significant risk of undue discrimination or preference; (3) developing policy in an *ad hoc* manner may trigger the Commission's prohibition on *ex parte* communications, chilling collaboration and regulatory engagement; and (4) properly calibrated and coordinated capacity accreditation policies can have significant benefits in terms of reliability, cost, fairness, economic efficiency, and cooperative federalism.

A technical conference on capacity accreditation would help develop a record to foster informed decision-making on the various capacity accreditation initiatives that are likely to arise over the next several years. Further, holding a technical conference to discuss capacity accreditation issues at a holistic level should not impede individual regions from continuing to refine their capacity accreditation methodologies, and submitting changes to the Commission where appropriate. Accordingly, ACP respectfully requests that the Commission hold a Technical Conference to discuss the topic with stakeholders, staff, and Commissioners as early as possible – ideally, within the next six months. However, ACP submits that even if Commission resources do not allow for a technical conference within that time frame, the issues detailed below will remain salient, and would benefit from a technical conference at a later date.

II. Background

Effective capacity (*i.e.*. capacity contributions for resource adequacy) is, in essence, the ability of a resource to be available in real-time to support reliability. It is a characteristic intrinsic to every resource nationwide, regardless of technology type. Capacity accreditation is the *measurement* of that characteristic – that is, the measure of an individual resource's contribution toward meeting the power system's resource adequacy needs.[2] It plays a critical role in the regulatory paradigm for maintaining the reliability of the bulk-power system. Whereas resource adequacy analysis is designed to "assess whether there are enough resources to serve load across the system," capacity accreditation is the tool used to determine "the contribution of individual resources toward meeting that goal, both in terms of capacity and energy."[3] As the power system's effective capacity needs evolve, and the need for particular capacity attributes changes, capacity accreditation metrics must also adapt to properly measure those shifting characteristics.[4]

There are numerous techniques that can be used to accredit capacity, including the following:

- estimating the effective load carrying capability ("ELCC") - the ability to help reduce loss-of-load events, loss-of-load hours, or expected unserved energy - either for individual resources or particular classes of resources;

- estimating a resource's marginal reliability improvement ("MRI"), or how it impacts the applicable resource adequacy metric relative to adding an equivalent amount of idealized capacity;

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[2] Energy Sys. Integration Grp. ("ESIG"), *Ensuring Efficient Reliability: New Design Principles for Capacity Accreditation*, at vii (Feb. 2023) ("ESIG Report"), *available at* https://www.esig.energy/new-design-principles-for-capacity-accreditation/ (last accessed Aug. 7, 2023).
[3] ESIG Rep. at vii.
[4] *See* ESIG, *Redefining Resource Adequacy for Modern Power Systems*, at 10 (2021), available at https://www.esig.energy/wp-content/uploads/2021/08/ESIG-Redefining-Resource-Adequacy-2021.pdf (last accessed Aug. 7, 2023).

- measuring a resource's performance relative to its nameplate capacity during certain peak load intervals (also known as a "peak load window" method);

- measuring a resource's production during periods of system stress (also known as a "resource adequacy hours" method);

- analyzing the percentage of the time that a resource's performance is expected to exceed a particular threshold (also known as an "exceedance" method);[5]

- using a resource's "unforced capacity," equal to the unit's nameplate capacity reduced by its equivalent demand forced outage rate (EFORd); and

- estimating a resource's expected availability on an hourly basis.[6]

Beyond the capacity accreditation technique used, there are four fundamental design characteristics that must also be considered:

(1) whether the technique uses a ***deterministic*** metric (*i.e.*, a value reflective of only one set of conditions) or a ***probabilistic*** metric (*i.e.*, a value based on analytical simulations across hundreds or thousands of potential conditions);[7]

(2) whether the method is ***prospective*** (*i.e.*, based on a forward-looking assessment of a resource's expected capabilities under future system conditions), ***retrospective*** (*i.e.*, based on a historical assessment of a resource's performance under real-world conditions), or a combination of the two (*e.g.*, the initial value is set using a prospective method, but is subject to later adjustment based on a retrospective performance assessment);[8] and

(3) whether the method accredits each resource based on an ***average contribution*** to reliability (*i.e.*, accrediting each resource based on the average reliability contribution of *all* resources within the same technology cohort) or a ***marginal contribution*** to reliability (i.e., accrediting each resource based on its incremental reliability contribution relative to other resources within the same technology cohort).[9]

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[5] *See, e.g.*, ESIG Rep. at 23 (summarizing capacity accreditation techniques in table format).
[6] *See, e.g.*, Comments of Monitoring Analytics, LLC, at 5-6, Dkt. No. AD23-7-000 (June 13, 2023).
[7] *See* ESIG Rep. at 12-15.
[8] *See id.* at 15-17.
[9] *See id.* at 17-23.

(4) whether ***fuel assurance*** is required for individual units, or handled probabilistically by unit, unit type, or system-wide.

In addition to these techniques and design principles, there are several other important considerations associated with different capacity accreditation methods. For example, the various techniques represent a wide range of options in terms of complexity, transparency, computational intensiveness, sensitivity to modeling assumptions, and predictability and stability. These design principles and associated considerations can have a significant impact on whether and how a chosen capacity accreditation technique will help serve its ultimate goal of ensuring reliability in a cost-effective manner.

Regardless of which technique is employed, the exercise of accrediting capacity serves reliability through two distinct (but related) applications: system planning and market design. With respect to system planning, capacity accreditation is used in several different ways that render it central to ensuring that the nation's power systems are planned and constructed to reliably serve consumers. More specifically, capacity accreditation can be used—in both ISO/RTO and non-ISO/RTO contexts—to (among other things) inform planning reserve margins, interconnection requests and related studies, integrated resource planning, and resource procurement.[10] In the context of market design, capacity accreditation is used (again, in both ISO/RTO and non-ISO/RTO regions) to ensure that resources are paid in a manner that corresponds with the reliability contributions they are providing to consumers, and to ensure that the market sends efficient price signals to guide entry and exit and achieve target reliability. Critically, certain capacity accreditation techniques can also help provide resources with a market-based incentive to support reliability by maximizing performance during emergency conditions, when the system needs it the most.

Furthermore, although system planning activities and market design activities often take place in separate processes, they are closely interrelated. As a result, the selection and implementation of a capacity accreditation technique can impact whether, and to what degree, a region's system planning and market design activities work in concert or in tension. In addition, because the Federal Power Act provides the states with significant jurisdiction over generation

[10] *See* ESIG Rep. at 7-8.

resources, the capacity accreditation framework can either help states achieve their policy objectives—consistent with the policy of collaborative federalism that Congress enshrined in the Federal Power Act—or it can hinder those objectives.

In short, capacity accreditation is an essential element of electricity system planning and market design, and it is becoming increasingly important as legacy nuclear, coal, and gas resources are supplemented by, or retired and replaced with, new technologies. Capacity accreditation policies have significant impacts on reliability, cost, fairness, accuracy, and the interaction of state and federal energy policy. Unfortunately, the current regulatory landscape on capacity accreditation reflects substantially varying regional approaches, and (as described below) in many cases is hindering improvement in each of those categories – which can place reliability at risk. At present, there is no common set of policy principles for capacity accreditation that applies across markets. Each ISO/RTO and utility approaches the topic in its own fashion, with varying degrees of stakeholder input. They typically file those capacity accreditation rules with the Commission under section 205 of the Federal Power Act (or, in some cases, with state regulators), and the case-by-case Commission precedent ultimately sets the policy framework (such as it is). That approach has created a patchwork of capacity accreditation policies with wide variations across the country.

Because capacity accreditation is increasingly being acknowledged as a critical aspect of our energy system, significant attention is now being focused on this topic in various ISO/RTO stakeholder working groups. However, at present, there is no focused, coordinated discussion occurring at the federal level, either at the Commission or at the North American Electric Reliability Corporation ("NERC"). As explained below, given both the importance and rapid evolution of capacity accreditation techniques, the industry would greatly benefit from the Commission convening a forum for such a discussion. A technical conference would serve to educate stakeholders, allow for open discussion with Commission staff, and hopefully help to foster consensus and consistency among regions to ensure that capacity accreditation techniques help achieve electric reliability at just and reasonable rates, without undue discrimination or preference.

III. Petition for Technical Conference

A. Capacity Accreditation Plays an Increasingly Important Role in the Reliability and Affordability of Electricity, and it is Critical that the Commission Convene an Open Forum to Discuss it

The trends of growing clean energy deployment, electrification, and retirements of fossil fuel-fired resources are each accelerating. That transformation has significant implications for the system's reliability needs and how they will be satisfied going forward. Reliability risks are shifting in four important ways, each of which highlights the importance of proper capacity accreditation.

First, the timing of power system supply risks is shifting. Historical periods of tight supply, often occurring during summer afternoon peak demand periods in much of the country, are moving to evening and overnight hours as solar effectively reduces midday risk. Resource adequacy risk is also shifting to the winter season due to changes in demand, fuel supply disruptions on the natural gas delivery network, weather dependent outages of thermal resources, and the potential for low wind and solar events as their penetration increases. As a result, the availability of a resource during annual peak demand hours may no longer be reflective of its contribution to resource adequacy. New methods to accredit resources can, and should, address these shifting risk periods.

Second, the shift to increased reliance on energy-limited resources (like battery storage, load flexibility, and demand response), in addition to fuel supply constraints of thermal generating resources, increases the need to accurately account for energy adequacy.[11] As the system transitions to reliance on energy storage and other resources that might not be able to sustain output throughout an extended period of system stress, reliability going forward "will largely be based on energy limitations across a wide range of hours rather than simply not having enough capacity available in a given moment."[12] Capacity accreditation techniques that account not only for nameplate capacity but also energy limits—whether due to battery charging constraints,

[11] *See* ESIG Rep. at 11.
[12] *Id.*

disruptions to natural gas fuel supply, or other factors—are critical, because they help to ensure that the system will have resources that can provide sufficient energy to maintain reliability.[13]

Third, the reliability of the power system is vulnerable to correlated outages or derates across the generating fleet during extreme conditions. These correlated outages or derates can occur within the same class of resources that suffer a lack of fuel supply—*e.g.*, when wind or solar resources within a certain region collectively experience low levels of wind or solar irradiance, or when natural gas-fired generators linked to the same pipeline experience a shortage of natural gas. These correlated outages or derates can also occur as the result of a common mode failure across classes. For example, generators that rely on once-through cooling and share a water source can experience simultaneous outages or output reductions due to high water temperatures or drought conditions.[14] To ACP's knowledge, no regional capacity accreditation approach submitted to the Commission to date has attempted to address reliability issues that cut across resource classes such as once-through cooling water, and most filings have not attempted to accredit thermal resources within a particular class based on other correlated outage risks like fuel supply disruption. This makes the topic particularly appropriate for an open, on-the-record discussion. Capacity accreditation can support reliability by reflecting the risks of correlated outages or derates that a resource faces in its capacity value, thereby helping system planners procure the diversified resources they need to manage those risks.[15]

As explained in NERC's 2023 State of Reliability report, "[t]he reliability of conventional generation is significantly challenged by more frequent extreme weather, high-demand conditions, and a changing resource mix, resulting in higher overall outage rates and surpassing

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[13] *See* ESIG Rep. at 11.

[14] *See e.g.*, NERC, *2022 Summer Reliability Assessment*, at 4 (May 2022) ("As drought conditions continue over the Missouri River Basin, output from thermal generators that use the Missouri River for cooling in Southwest Power Pool (SPP) may be affected in summer months. Low water levels in the river can impact generators with once-through cooling and lead to reduced output capacity. Energy output from hydro generators on the river can also be affected by drought conservation measures implemented in the reservoir system. Outages and reduced output from thermal and hydro generation could lead to energy shortfalls at peak demand."), *available at* https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2022.pdf (last accessed Aug. 7, 2023).

[15] *See e.g.*, PJM Interconnection L.L.C., *Winter Storm Elliott: Event Analysis and Recommendation Report*, at 2,4,5 (July 17, 2023) (including capacity accreditation in the list of recommended reforms to better manage extreme weather events like Winter Storm Elliott), available at https://pjm.com/-/media/library/reports-notices/special-reports/2023/20230717-winter-storm-elliott-event-analysis-and-recommendation-report.ashx (last accessed Aug. 7, 2023).

transmission in their contribution to major load loss events."[16] As a result, "generation capability during periods of extreme weather is now the greatest indicator of risk for the [Bulk Electric System]."[17] NERC emphasized that this risk is poised to increase considering the "consistently increasing coal outage rates throughout the year, the higher penetration of variable energy resources (VER) (such as wind and solar photovoltaic (PV)), and poor natural gas performance during extreme weather and high demand conditions."[18] Capacity accreditation can help address this by recognizing correlated outage risks for all resources, and accurately reflecting capacity accreditation across all resource types accordingly.

Fourth, even when the types of extreme conditions described above are not present, the existing thermal generation fleet is aging, which will result in increased outages and maintenance requirements. Capacity accreditation can help address this by accurately capturing the changes in each resource's capability as it ages, thereby giving system planners and market participants better visibility into the need for additional resources.

As a result of these changing reliability risks, several of the other challenges facing the electric industry are becoming more acute. Those challenges include the following:

- Over the past several years, reserve margins have been shrinking in many parts of the country.[19] This trend is the result of intentional decision-making, as regions with historical oversupply are replacing retiring generation resources with only the resources necessary to meet the stated reliability criteria. Ongoing efforts to more efficiently deploy capital and make more efficient use of the power system may be jeopardized if reliability margins also shrink due to inaccurate capacity accreditation policies. The combination of tighter reserve margins and inaccurate capacity accreditation essentially

[16] NERC, *2023 State of Reliability Technical Assessment: Technical Assessment of 2022 Bulk Power System Performance*, at 6 (June 2023), *available at* https://www.nerc.com/pa/RAPA/PA/Performance%20Analysis%20DL/NERC_SOR_2023_Technical_Assessment.pdf (last accessed Aug. 7, 2023).
[17] NERC, *2023 State of Reliability Technical Assessment: Technical Assessment of 2022 Bulk Power System Performance*, at 6 (June 2023), *available at* https://www.nerc.com/pa/RAPA/PA/Performance%20Analysis%20DL/NERC_SOR_2023_Technical_Assessment.pdf (last accessed Aug. 7, 2023).
[18] *Id.*
[19] *See, e.g.*, NERC, *2022 Long-Term Reliability Assessment* (Dec. 2022), *available at* https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_2022.pdf (last accessed Aug. 7, 2023); NERC, *2019 Long-Term Reliability Assessment*, *available at* https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_2019.pdf (last accessed Aug. 7, 2023).

pairs a smaller margin of error with decreased situational awareness during stressed conditions, which is a formula for decreased reliability.

- Real-time system operations are becoming more complex as system flexibility needs increase, and not all legacy resources are equally capable of addressing these needs in real time. Increased ramping needs, unit cycling (on/off), and new ancillary service requirements are changing not only the *amount* of capacity required, but also the *attributes* of resources needed to operate reliably. Multiple ISOs/RTOs and utilities are exploring new ancillary service products (including ramping reserves, emergency contingency reserves, imbalance reserves, etc.)[20] to differentiate resources based on speed and duration of response. Capacity accreditation can help address these evolving system needs by considering the operational characteristics and performance of different resources—and the relationships between different resource types—rather than simply considering the resources' stated nameplate capacity. Moreover, "capacity" available to provide energy is not necessarily the same as capacity available to provide flexibility and other services. The overall market design or resource procurement should attract and retain all resources and attributes needed to operate reliably, and should do so by clearly delineating the various services the system needs and the market rate for each of those services.

- Wholesale electricity markets will need to adapt to successfully transition to a decarbonized energy system. Markets need to incent the orderly entry and exit of resources, in which the right megawatts are coming onto the system, at the right time, and in the right locations, based on when other megawatts are exiting the system and expected demand growth—while also providing the price signals and revenues sufficient to attract and retain needed resources. That is a significant challenge under the best conditions. Inaccurate capacity accreditation exacerbates the challenge, making each component more difficult: incorrectly measuring the capacity that needs to be replaced, incorrectly measuring the capacity of the replacement resources, and resulting in price signals and capacity revenues that are also inaccurate.

- A failure to properly accredit the capacity value of new and existing resources risks overpaying some resources for the value they provide to the system (and ultimately to consumers) and underpaying other resources. Systemic inaccuracies in capacity accreditation risk inflating supply and thereby driving auction prices lower than they would be based on accurate representations of supply and demand. Beyond the impacts associated with any one individual resource, inaccurately valuing the capacity of a

[20] *See, e.g.*, Elec. Reliability Council of Tex. (ERCOT), Press Release, ERCOT Adds New Ancillary Service to Support Grid Reliability (June 12, 2023), https://www.ercot.com/news/release/2023-06-12-ercot-adds-new; Cal. Indep, Sys. Operator,Day-Ahead Market Enhancements, Final Proposal (January 11, 2023), *available at* http://www.caiso.com/InitiativeDocuments/FinalProposal-Day-AheadMarketEnhancements.pdf (last accessed Aug. 7, 2023); Midcontinent Indep. Sys. Operator, Inc., Short Term Reserves Primer (Mar. 2021) (introduced in 2022), *available at* https://cdn.misoenergy.org/STR%20Primer%2020210310530762.pdf (last accessed Aug. 7, 2023).

significant portion of the resource portfolio in a region can render the market signals in that region inaccurate and potentially unlawful.[21]

If left unaddressed (or addressed only in a piecemeal fashion) the combination of the above challenges and inappropriate capacity accreditation policies could lead to a less reliable, more expensive system. *But that result is not inevitable.* The opposite outcome – a clean and reliable system at just and reasonable rates – is attainable if the Commission leads the industry to proactively engage in appropriate education and planning at this critical juncture, and works collaboratively with states, ISOs/RTOs, and other stakeholders to ensure that capacity accreditation policies are tailored to meet national, regional, and state needs. Prompt timing of the Technical Conference is vital, because the Commission's ability to provide guidance, identify best practices, and respond to challenges will influence regional processes with long-term effects. Many ISOs/RTOs and other planning entities are actively considering reforms to their capacity accreditation processes, and many of those reforms are either already under review at FERC or will be filed in the relatively near future. Given the time, complexity, and technical challenges associated with significant market and regulatory reforms, it is important that these efforts be undertaken in a clear, consistent, and objective manner to ensure that the reforms be durable for many years to come. The Commission can and should proactively facilitate that process through a technical conference intended to help equip the industry and other stakeholders with the tools needed to make sound, well-informed decisions concerning capacity accreditation.

B. Reasons Why a Technical Conference Is Necessary

As explained above, capacity accreditation is a critical element of both system planning and wholesale power markets – both bilateral contracting markets, and organized markets administered by ISOs/RTOs. The goal of capacity accreditation is to estimate, in advance, how a resource is going to operate, particularly when the electricity system is most at risk of shedding load. Because capacity is an intrinsic characteristic of all resources, capacity accreditation is relevant nationwide. Unfortunately, the existing regulatory framework does not treat it

[21] *See, e.g.*, *Midcontinent Indep. Sys. Operator, Inc.*, 180 FERC ¶ 61,141 (2022), Commissioner Danly concurring, at P 2 ("A market's failure to procure sufficient capacity with the needed characteristics is a flaw so fundamental that it calls the justness and reasonableness of a market's resulting rates into question.").

accordingly. From a policy perspective, there is no consensus or Commission direction regarding best practices for accrediting capacity, much less regulatory standards governing such practices. In short, capacity accreditation methods are poorly established and are being developed inconsistently across various regions (and, in some regions, not at all). ACP submits that the current policy landscape is not serving the industry (or customers) well, and would greatly benefit from FERC's concentrated attention to this topic.

At present, capacity accreditation methods are being established in an *ad hoc* manner by the Commission, ISOs/RTOs, and public utilities through various filings submitted under section 205 of the Federal Power Act—and the Commission has provided no policy principles to guide the development of those regional filings. Determining capacity accreditation in that manner represents an inadequate regulatory framework for several reasons.

First, the lack of clear policy guidance, or even an actionable set of first principles on which to build, has led to a patchwork of capacity accreditation rules across the country. As explained in more detail below, there is now a wide range of Commission-approved methodologies for valuing a characteristic that is common to all resources. And that breadth of methodologies has resulted in a striking disparity in how capacity is valued in different regions, or even within a given region. For example:

- ISO-NE and NYISO are proposing to accredit all resources using the Marginal Reliability Improvement ("MRI") technique.[22] (note that while ISO-NE and NYISO are both using MRI, the calculations are slightly different in the two cases, highlighting the importance of a technical conference.

- PJM, in contrast, uses adjusted class average ELCC accreditation for wind, solar, and energy limited resources,[23] and is currently considering accreditation for thermal resources as well as a shift to marginal ELCC.[24]

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[22] *See* ISO-New England, Power Point Presentation, "Resource Capacity Accreditation in the Forward Capacity Market" (Dec 6-8, 2022), *available at* https://www.iso-ne.com/static-assets/documents/2022/12/a02a_mc_2022_12_06_08_rca_iso_design_presentation.pptx (last accessed Aug. 7, 2023); Pallas LeVanSchaick & Joseph Coscia, "NYISO Capacity Accreditation: Conceptual Framework and Design Principles" (Potomac Econ. Aug. 9, 2021), *available at* https://www.nyiso.com/documents/20142/23645207/20210730%20Potomac%20-%20Capacity%20Accreditation%20-%20Conceptual%20Framework-7-30-2021.pdf (last accessed Aug. 7, 2023).

[23] *See See PJM Interconnection, L.L.C.*, 176 FERC ¶ 61,056, at PP 7-11, 31 (2021).

[24] *See* PJM Interconnection, L.L.C., "Resource Adequacy Senior Task Force: Key Work Activity Options," at 6, *available at* https://www.pjm.com/-/media/committees-groups/task-forces/rastf/2022/20221110/rastf-template-for-high-level-design-concepts---pjm.ashx (last accessed Aug. 19, 2023).

- SPP has proposed, and is considering proposing again, a tiered "incremental average" ELCC method for wind and solar resources and UCAP accreditation for thermal resources, although it is currently revisiting that plan.[25]

- MISO has adopted a Seasonal Accredited Capacity framework for thermal resources and demand response resources that is based on an *ex post* assessment of those resources' actual historical performance and an ELCC framework for wind resources that is based on *ex ante* statistical forecasts.[26] Further, MISO is proposing to adopt an ELCC framework for solar resources, and has announced longer-term plans to do the same for energy storage resources and thermal resources, although details remain unclear.[27]

- The California resource adequacy construct, administered by the California Public Utilities Commission ("CPUC"), is proposing a "slice of day" resource adequacy construct and an "exceedance" resource accreditation method for some, but not all, resources.[28]

- The Western Resource Adequacy Program ("WRAP") is planning to use seasonal marginal ELCC for wind, solar, and storage resources; historical output during Capacity Critical Hours for run-of-river-hydro; UCAP for thermal; and load reduction impacts for demand response.[29]

- ERCOT is considering a performance credit mechanism based on real-time availability during historical hours in which margins were tight.[30]

- Non-ISO/RTO regions are actively conducting inquiries on capacity accreditation.[31]

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[25] *See* Southwest Power Pool, "Performance Based Accreditation and Effective Carrying Capability Overview, Resource," (Aug. 11, 2023), *available at* https://spp.org/Documents/69894/REAL%20Additional%20Meeting%20Material%2020230811.zip (last accessed Aug. 19, 2023).

[26] *See Midcontinent Indep. Sys. Operator, Inc.*, 180 FERC ¶ 61,141 (2022), Clements, C. dissenting, at PP 2, 37-43.

[27] *See* MISO, Resource Accreditation White Paper, at 9 (Version 1.0 Draft May 2023), *available at* https://cdn.misoenergy.org/MISO%20Draft%20Resource%20Accreditation%20Design%20White%20Paper628865.pdf (last accessed Aug. 7, 2023).

[28] See Cal. Pub. Util. Comm'n (CPUC), *Decision 23-04-010: Decision on Phase 2 of the Resource Adequacy Reform Track*, at 6 (Dkt No. 21-10-002) (Apr. 6, 2023).

[29] W. Power Pool, *Western Resource Adequacy Program: Detailed Design*, at 11 (Mar. 2023), *available at* https://www.westernpowerpool.org/private-media/documents/2023-03-10_WRAP_Draft_Design_Document_FINAL.pdf (last accessed Aug. 7, 2023).

[30] *See, e.g.,* ERCOT, Phase 2 Bridging Options (2023) *available at* https://www.ercot.com/mktrules/puctDirectives/phase-2-bridging-options (last accessed on Aug. 7, 2023).

[31] *See e.g.,* Colo. Rev. Stat. § 40-43-101, *et seq*. (2023) (requiring load-serving entities to submit annual reports on the adequacy of their electric resources, including details on those resources accredited capacity); *In the Matter of*

To be sure, some regional variation may be necessary or appropriate based on the circumstances of each region. However, such variations should be the result of thoughtful deliberation and policymaking, rather than the result of decision-making on a utility-by-utility or individualized ISO/RTO basis.

Second, establishing capacity accreditation rules only through *ad hoc* FPA section 205 filings, without meaningful regulatory guidance, poses significant risk that such rules will result in undue discrimination. To the extent different utilities or ISOs/RTOs use differing capacity accreditation techniques that produce disparate outcomes, those disparities should be the result of legally significant differences in the capacity products or relevant regulatory requirements between those utilities or ISOs/RTOs. By the same token, to the extent resources are similarly situated, they should not be subject to unduly discriminatory treatment. Unfortunately, under the current regulatory regime, there are no clear standards governing how resources' capacity value is treated in this respect; additionally, utilities, ISOs/RTOs, and stakeholders have no actionable policy guidance on which to base their decisions when setting capacity accreditation rules through FPA section 205.

Third, developing policy only through individual FPA section 205 proceedings chills collaboration and regulatory engagement. When a capacity accreditation proposal is filed with the Commission, it is essentially guaranteed that the proposal will garner substantial public comments, at least some of which are certain to contest the proposal. As a result, the prohibition on *ex parte* communications set forth in the Commission's regulations immediately shuts off communication between the Commission and stakeholders concerning capacity accreditation initiatives in *other* regions that may share common elements. That, in turn, harms the progress of capacity accreditation initiatives, and means that whatever reforms are developed through those initiatives will not reflect even the informal guidance that the Commission and its expert staff might be able to provide. With the proliferation of capacity accreditation filings in recent years, it has become increasingly challenging for industry members to engage in discussions with

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Pub. Util. Comm'n of Or. (OPUC), Gen. Capacity Investigation, Order No. 22-468, 2022 ORE. PUC LEXIS 441 (OPUC Dec. 1, 2022) (adopting staff recommendation).

the Commission that could well improve subsequent proposals. In contrast, an on-the-record open proceeding such as a technical conference would allow for meaningful dialogue and exchange of ideas between different regions and market participants, as well as with the Commission and its staff.

Given the rapidly changing resource mix, it is important that FERC, NERC, and the industry at large stay up to speed on rapidly evolving resource adequacy and capacity accreditation methods. This will ensure that regulations and market design activities are proactive – anticipating reliability challenges and making early, and effective, changes to prevent those challenges from escalating to reliability crises and/or delayed capacity market auctions. Failure to do so could result in opaque reliability backstop actions like reliability must-run agreements, out-of-market procurements, and inaccurate market prices; this in turn can distort market signals, impede efficient and fair competition, and significantly increase consumer costs.

C. Considerations for Effective System Planning and Market Design

Capacity accreditation helps system planners and operators determine whether they have the necessary amount and type of resources available to serve load across a wide range of power system uncertainty, and whether the transmission system is able to accommodate those resources. In addition, in capacity markets or competitive capacity procurements, capacity accreditation also provides a necessary economic signal to ensuring that new resources are selected in an efficient, low-cost, manner.

Through that range of applications, capacity accreditation can help balance economic efficiency and reliability. But no two regional capacity accreditation schemes have been the same to date and, as explained above, the variations across different regions and even within a particular region can be—and, at present, demonstrably are—drastic. When designing, revising, or assessing the efficacy of a particular capacity accreditation technique, ACP submits that the Commission should evaluate five main considerations: 1) reliability, 2) cost, 3) fairness, 4) accuracy, and 5) harmonizing state and federal policies on resource adequacy. On each of those considerations, capacity accreditation policy, if designed properly, can bring significant reliability and economic benefits to the bulk power system - and ultimately to consumers.

1. Reliability

The first, and perhaps most important, consideration for any capacity accreditation construct is whether it will help maintain reliability. A properly designed capacity accreditation framework will help to ensure that the system has sufficient resources to serve load across a wide range of uncertain conditions, caused by unpredictable weather and other factors that can cause outages of load, generation, or transmission. In that regard, proper accreditation allows planners and the market to procure the necessary amount and type of resources, in the right locations, to support reliability during times of system stress.

In addition to facilitating reliability through long-term planning, proper capacity accreditation also can help improve resource performance during real-time operations. Real-time system conditions may vary due to changes in both demand and supply, including the effects of correlated outages across all resource types. The industry is beginning to reconsider whether the historic reliability metric of loss of load expectation (LOLE) is sufficient to ensure reliability during infrequent but severe circumstances, and some regions are evaluating whether new metrics and standards are needed to ensure grid reliability in the future. NERC's reliability standards are increasingly recognizing the important reliability benefit of making resources better able to avoid widespread outages correlated with extreme weather, and to respond when most needed.[32] So, too, should capacity accreditation policies account for realities of real-time operations. Such an approach increases the likelihood that the market (either via a capacity market or a competitive solicitation) will send proper performance incentives and procure the resources that can maintain reliability during times of system stress.[33] Additionally, proper capacity accreditation should account for the dynamic relationship of a resource's capacity value

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[32] *See, e.g.*, *N. Am. Elec. Reliability Corp.*, 182 FERC 61,094, at P 2 (2023) (approving reliability standards for extreme cold weather to "ensure enough generating units will be available during the next cold weather event').

[33] *See, e.g.*, Jacob Mays and Joshua C. Macey, Working Paper Sch. of Civ. & Envt'l Eng'g, Cornell Univ., *Accreditation, Performance, and Credit Risk in Electricity Capacity Markets*, at 19 (Optimization Online July 2023) ("Policymakers are faced with two suboptimal choices: either they can keep low non-performance penalties, in which case generators will not have sufficiently strong incentives, or they can increase non-performance penalties, in which case generators that are unable to pay the penalties will default on their obligations. Both options allow generators to avoid fully bearing the costs of a failure to deliver."), *available at* https://optimization-online.org/2023/06/accreditation-performance-and-credit-risk-in-electricity-capacity-markets/ (last accessed Aug. 7, 2023).

to other resources in the system portfolio over time. Failure to account for these relationships can result in resource portfolios that fail to meet expected reliability targets.

In terms of measuring resources' reliability contributions, there are two primary categories of methods for accrediting resources: probabilistic methods or deterministic methods.

- *Probabilistic* methods simulate resource availability across a wide range of stochastic samples, each of which is based on variables including resource availability, generator outages, and load, using those samples to approximate the expected, or average, availability of a resource. This method relies on power system modeling and simulation of likely future weather conditions and reliability risks.

- *Deterministic* methods, on the other hand, can use either simulation or historical resource availability. Rather than evaluate a resource probabilistically across a wide range of potential conditions, deterministic approaches look at resource availability during a pre-determined time period. These time periods may include historical tight-supply conditions or likely output during typically high-risk months or hours. For example, a resource may be accredited on its likely availability during peak load periods or during a predetermined month-hour window expected to have elevated system risk.

Both approaches can be used to evaluate a resource's availability during tight supply conditions, but differ in their complexity, transparency, modeling accuracy, and linkage to actual operating conditions and real-time availability.

2. Cost

Properly designed capacity accreditation techniques can also help temper consumer costs by protecting against unnecessary over-procurement. Continuous investment in new resource capacity may improve reliability, but it can also come at a significant financial cost ultimately borne by consumers.

At an individual resource level, accurately accrediting capacity ensures that resources will receive compensation that accurately reflects the reliability contributions they provide. The more accurate the accreditation, the less likely a resource will be overpaid for reliability contributions (if they are unavailable when needed for reliability), or underpaid for reliability contributions (if they support reliability more than expected).

Beyond properly calibrating compensation for individual resources, accurate capacity accreditation can help to support economically efficient entry and exit. Where capacity is procured through a centrally cleared market, accurate capacity accreditation ensures that the resulting market price signals send economically efficient signals to attract new entrants and drive resources to exit the market when they are no longer needed. Where capacity is transacted bilaterally, accurate capacity accreditation ensures that load-serving entities buy enough capacity to satisfy their resource adequacy requirements while avoiding procuring more than needed to reliably serve load. This ultimately balances costs to consumers and reliability. Analogous to locational marginal pricing ("LMP") in the energy market, proper capacity accreditation can differentiate resource availability across both time and location, thereby sending price signals for resource additions or retirements that match the system's needs, based on a granular assessment of the locations and times of those needs.

3. Fairness

Because the objective of capacity accreditation is to measure—and ultimately compensate—each resource based on its contribution towards resource adequacy, it is important to do so in a fair manner. If done correctly, capacity accreditation creates an "exchange rate" through which resources of different types, configurations, and locations can be compared against one another in a technology-neutral manner.[34] Inaccurate accreditation, however, can create biases in resource compensation, selection, and retirement decisions.

The requirement to conduct capacity accreditation in a fair manner arises from the Federal Power Act's requirement that all rates, and rules and regulations affecting such rates, be just, reasonable, and not unduly discriminatory.[35] In addition, it is a fundamental principle of wholesale electricity market design that resources should be compensated based on the value they provide to the market. While the true value of reliability (*e.g.*, the value of lost load) may be difficult to quantify, the relative *contributions* of different resources can be measured to ensure fairness. Any differences between individual resources or resource classes should be

[34] *See* Samuel A. Newell, Kathleen Spees & John Higham, "Capacity Resource Accreditation for New England's Clean Energy Transition, Report 1: Foundations of Resource Accreditation" (June 2022), *available at* https://www.brattle.com/wp-content/uploads/2022/06/Capacity-Resource-Accreditation-for-New-Englands-Clean-Energy-Transition-Foundations-of-Resource-Accreditation-1.pdf (last accessed Aug. 7, 2023).

[35] *See* 16 U.S.C. 824d(a)-(b).

justified by a resource's specific attributes and operations, rather than by assumed differences.[36] While solar, wind, hydro, storage, thermal, and demand response resources operate very differently, they can be measured for their reliability contributions in a similar manner. More broadly, when considering how a particular variable impacts capacity value, the analysis should span resource classes to ensure that the impacts are fairly assessed. For example, because weather can cause common mode failures that cross resource types—*e.g.*, in extreme heat or drought conditions, shared once-through cooling water sources can cause simultaneous outages or derates for thermal, nuclear, and hydroelectric units—capacity accreditation methods should assess weather-related impacts for all types of resources, rather than for just a subset of resources.

Fairness is also important when considering the treatment of resources within a particular resource class, and properly differentiating between *individual* resources based on specific configuration and location. A resource's capacity value can also change over time due to various factors, including the amount of other resources with similar characteristics added to the system (saturation effects) and the amount of complementary resources added (portfolio effects). Saturation effects occur because, as similar resources are added to the system, resource risk is mitigated during periods when those resources are available. This shifts the remaining risk to other time periods. Portfolio effects represent another important consideration when assessing the fairness of resource accreditation techniques. Because a resource's capacity accreditation depends on the composition of the entirety of the resource portfolio, it can be difficult to disaggregate which resources should be assigned which portion of the capacity value of the portfolio as a whole.

Accredited capacity value might also increase over time (for example, if new or upgraded transmission infrastructure increases deliverability) or decrease over time (for example, if increased congestion decreases deliverability). As a result, to ensure that resources are compensated in accordance with the value they are providing, the capacity accreditation of a

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[36] *See Sw. Power Pool, Inc.*, 180 FERC ¶ 61,074 (2022), Clements, C. dissenting, at PP 12-13 (explaining that capacity accreditation methodologies for different types of resources "may justifiably differ" as long as the methodology applied to each type of resource "reflect[s] realistic expectations of the resource adequacy value each resource brings to the table").

resource could change based on the timing of the resource's market entry, the composition of the overall resource portfolio, and numerous other potential variables. It is important to recognize that allowing a resource's capacity accreditation to change over time presents an important tradeoff insofar as it also makes the resource's revenue streams less stable and predictable. Accordingly, ensuring that the mechanisms that produce those potential changes are well-defined—*i.e.*, both transparent and intelligible for market participants—can help resource owners and developers transact and raise capital, and is an area that would benefit from the dialogue and record development of a technical conference.

4. Accuracy

It is not enough for a capacity accreditation method to be fair; it must be both fair *and accurate*. For example, identical capacity accreditation rules could conceivably be applied apply to all resources, but modeling methods and assumptions could lead that uniform methodology to provide inaccurate accreditation for some resources and not others.

Capacity accreditation is one of the few market design mechanisms that often bases actual pricing and compensation upon simulated performance and modeled power system operations. As a result, the inputs, assumptions, and modeling tools can significantly influence the accuracy of a resource's capacity accreditation. Based on the degree of accuracy for a particular resource, that resource's revenues can vary wildly.

For example, even if marginal ELCC (or an alternative methodology) is applied to thermal resources in a consistent manner, similar to variable renewables, assumptions concerning how the methodology is applied can lead to inaccurate outcomes. A clear example of this is related to weather-dependent outages and fuel constraints on thermal generators. Even if thermal generators are subjected to capacity accreditation rules, omitting correlated risk associated with weather dependent outages and fuel constraints would overstate such resources' accredited capacity value. The decision on whether to include weather dependent outages and fuel supply constraints will also affect the accreditation of other, non-thermal resources.

Accuracy of capacity accreditation can also be influenced by the accuracy of the underlying weather data used in the analysis (load, wind, solar, and temperature), the number of weather years evaluated, the details on plant configuration, and how transmission is considered (which is often simplified to approximate resource deliverability during tight margin conditions). Each of these assumptions can significantly affect the accuracy of accreditation and pricing, but the methods are highly inconsistent across ISOs/RTOs.

Even details as nuanced as how modeling tools schedule resources and simulate operations can change the accuracy of an accreditation technique. There are numerous modeling inputs that can materially impact accreditation values in this way, and many of those are inconsistently applied across the industry. Some examples include how forecast uncertainty is considered, how resources are scheduled, which reliability criterion is used in accreditation calculations, and how the system is adjusted to be brought to a reference point LOLE.[37]

5. Respecting Cooperative Federalism by Harmonizing State and Federal Policies on Resource Adequacy

Congress carefully crafted the Federal Power Act with an eye toward fostering cooperative federalism, by establishing a statutory interdependence of federal and state regulation of the electricity sector.[38] That interdependence is perhaps most pronounced with respect to the regulation of generation resources and resource adequacy.[39] Given its central role in facilitating resource adequacy, capacity accreditation is at the nexus of that federal-state regulatory interdependence. As a result, the Commission's regulatory framework for capacity accreditation necessarily has an impact on state policies, and vice versa. That dynamic drastically elevates the stakes associated with the Commission's capacity accreditation policies. ACP respectfully submits that proper capacity accreditation policies can serve to harmonize state and federal policies concerning resource adequacy. The specific interactions of state and federal

[37] The modeled capacity value of energy storage and hybrid resources can be particularly sensitive to methodological choices; for example, whether value accounts for state of charge and a resource's ability to dispatch if needed (for discharge or charge), or whether it only accounts for observed dispatch.
[38] *See Hughes v. Talen Energy Mktg., LLC*, 578 U.S. 150, 154 (2016) (describing the respective jurisdictional responsibilities of the Commission and the states under the Federal Power Act).
[39] *Compare* 16 U.S.C. § 824d (vesting the Commission with exclusive jurisdiction over the rates and charges for wholesale sales of electricity and practices affecting such rates and charges) *with* 16 U.S.C. § 824(b)(1) (vesting states with jurisdiction over "facilities used for the generation of electric energy"); *see also Conn. Dep't of Pub. Util. Control v. FERC*, 569 F.3d 477, 483-85 (D.C. Cir. 2009) (discussing the Commission's authority to set the installed capacity requirement to be used in a forward capacity market).

roles in this area, and how to best accommodate both, has not been directly addressed in past § 205 filings on capacity accreditation, and would specifically benefit from a technical conference.

States across the country are undertaking ambitious resource procurement efforts, from renewable portfolio standards, to energy storage mandates, to integrated resource planning processes with state-regulated utilities. And some states are actively reforming their resource adequacy frameworks—including capacity accreditation rules in place at the state level—to match their state policy goals for resource procurements. For example, as noted above, the CPUC is at the advanced stages of shifting to a 24-hour "slice of day" resource adequacy framework, which aims to ensure that the state's resource adequacy program "can provide grid reliability at all times of the day."[40] Part of that framework entails reforms to the capacity accreditation rules the CPUC will apply to determine how each resource will contribute to satisfying the state's resource adequacy requirements. Specifically, the CPUC has adopted an exceedance-based approach for solar and wind resources, an exceedance-based adjustment to the existing capacity accreditation rules for hybrid and co-located resources, and a Pmax approach for energy storage resources.[41] Critically, the CPUC expressly acknowledged that its reforms are inextricably linked to CAISO's market rules and, therefore, that much work remains to be done by CAISO – with the Commission's approval – to coordinate California's shift to the slice-of-day resource adequacy framework.[42]

As with the potential CAISO reforms being explored to accommodate California's evolving resource adequacy and capacity accreditation framework, capacity accreditation rules overseen by the Commission can have a significant impact on the states' ability to meet their energy policy goals. Furthermore, accurately and fairly accrediting capacity across broader swaths of the country can help states' policies complement each other and co-optimize in a manner that will help each state reach its goals at least cost.

[40] See CPUC, *Decision 23-04-010: Decision on Phase 2 of the Resource Adequacy Reform Track*, at 6 (Dkt No. 21-10-002) (Apr. 6, 2023).
[41] *See id.* at 30-33, 38, 46.
[42] *See id.* at 73 (explaining that one of the key workstreams of the CPUC's reforms is to "identify necessary changes to the CAISO tariff to ensure consistency across the Commission's and CAISO's processes"); *id.* at 76-77 (noting that CAISO will be exploring compliance options through its stakeholder process).

ACP submits that a technical conference would provide a transparent, productive forum to discuss how capacity accreditation can best support state-level energy policy goals. The benefits would be both direct, by fostering a conversation about how to improve the efficacy of Commission-jurisdictional capacity accreditation, and indirect, by helping to establish a set of best practices for the technical aspects of capacity accreditation which states can look to as they continue their policymaking efforts.

D. Topics for Technical Conference

Below is a proposed agenda that the Commission could use as guidance for the requested Technical Conference. A more detailed version of the agenda, with a list of recommended questions for the Commission to consider addressing, can be found in Attachment A to this Petition.

- **Panel 1 - Capacity Accreditation for All Resources**
- **Panel 2 - Linking Capacity Accreditation and Empirical Availability**
- **Panel 3 - Modeling Considerations for Resource Adequacy and Capacity Accreditation**
- **Panel 4 – Transmission and Capacity Accreditation**
- **Panel 5 – Harmonizing State and Federal Policies**

ACP respectfully submits that a technical conference addressing the above topics would provide a useful forum to explore best practices, discuss opportunities for improvement, and help the industry—as well as the Commission and its staff—make informed decisions in system planning and market design initiatives.

IV. Conclusion

For the reasons discussed above, ACP respectfully requests that the Commission hold a Technical Conference at the Commission's earliest convenience to explore the various capacity accreditation techniques available to the industry, the various system planning and market design applications of those techniques, and the significant impacts that the regulatory framework governing capacity accreditation can have on the bulk power system.

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Dated August 22, 2023

Attachment A
Proposed Agenda for Technical Conference

I. **Panel 1 – Capacity Accreditation for All Resources:** This panel would address topics related to accrediting thermal resources, incorporating fuel supply constraints, and how to accredit additional resources like demand response, load flexibility, and new transmission. The panel could also address how to differentiate resources within a resource class. This includes considerations of hybrid resources, resource location, and options related to plant configuration.

1. How should the Commission support technology neutrality while appropriately factoring in the contributions from all resources?

2. Which resource classes should be included in a capacity accreditation framework, and how can a single capacity accreditation method be applied to multiple resource classes in a consistent manner?

3. Should a hybrid resource be evaluated individually based on its unique configuration, or using the sum of the individual parts?

4. Should resources of the same technology be differentiated based upon their location (transmission constraints, weather conditions)? Or should accreditation be uniform across the service area?

5. Should resources of the same technology class be differentiated by plant configuration (dual fuel capability, tracking systems, inverter loading ratios, energy storage duration, etc.)?

6. Are certain accreditation techniques (i.e. ELCC, MRI, exceedance, etc.) better suited to be applied to multiple resource classes?

7. How should fuel supply constraints be reflected in capacity accreditation and which resource classes should this apply to?

8. How should weather dependent outages be reflected in capacity accreditation and which resource classes should this apply to?

9. How should new resources, without historical operating data, be accredited in the first year(s) of a capacity accreditation construct, and how should this data be sourced? Should this method be adjusted to reflect actual operations? If so, when?

10. What data needs would be required to accurately develop capacity accreditation metrics for all resource types?

11. How should capacity accreditation account for the interaction effects of other resources assumed to be in the portfolio over time (including common mode failure risks) and balance potential over-simplification with the challenge of computational complexity?

12. What techniques can be applied to capacity accreditation to assess the value of stored energy (e.g. from energy storage) in ensuring energy sufficiency in grids with high levels of variable resources?

II. **Panel 2 – Linking Capacity Accreditation and Empirical Availability:** There are various methods that can be used to link capacity accreditation and actual operations during tight supply conditions. These include measuring a resource's availability or output during actual tight supply conditions, and using operating reserve demand curves. This panel would address the benefits, limitations, and market design considerations of such approaches.

1. Should capacity accreditation be based on simulated performance during simulated tight supply conditions, or on actual availability during historical periods of tight supply?

2. Are there opportunities to blend capacity accreditation methods, including both simulated performance and actual availability?

3. How can operating reserve demand curves (ORDC), pay-for-performance, or other mechanisms be used to further support resource availability during tight reserve periods?

4. How should energy limited resource availability (*i.e.*, energy storage and demand response) be measured during real-time scarcity events?

5. How can resource availability and forced outages be better captured in resource adequacy modeling and capacity accreditation?

6. How should capacity accreditation methodologies balance, on one hand, the need for adjustments to reflect actual availability with, on the other hand, the need to ensure that asset owners and developers are able to model their projected revenues?

7. Are there ways to help ensure that variable capacity accreditation methods do not make it more difficult for developers to obtain project financing?

III. Panel 3 – Modeling Considerations and Standards for Resource Adequacy and Capacity Accreditation: This panel would address the details of various modeling techniques, assumptions, and differences in how accreditation is quantified, and the reliability metrics that are the basis for accrediting resources. This could include details on modeling tool capabilities, best practices for modeling different resource classes, alternative reliability criteria and standards, and other modeling details.

1. For accreditation methods that utilize probabilistic resource adequacy studies, which modeling techniques are considered best practices for calculating loss of load expectation and capacity accreditation?

2. Does either the marginal or average accreditation method provide a more accurate price signal for new entrants and exits in capacity markets? Are there other benefits or limitations to using average and marginal accreditation methods? If so, please describe.

3. How many weather years should be evaluated in the modeling, and which generator or system properties should weather data be included for? What data gaps are there to conduct this analysis?

4. How should long-term resource optimization relate to capacity accreditation?

5. How should prospective weather data be incorporated? How should extreme weather events and/or climate trends be included in the analysis?

6. If the power system is above or below the resource adequacy criterion (*i.e.*, one-day-in-ten-years LOLE), should the model be brought to the criterion before calculating capacity accreditation metrics? If so, how should that be done? Should this be adapted for seasonal accreditation constructs?

7. For energy limited resources (storage, demand response, load flexibility, etc.) does the sequencing of dispatch decisions in the model affect capacity contributions? If so, how should this sequencing be determined?

8. Which reliability criteria should be used for calculating capacity accreditation (*i.e.*, LOLE, LOLH, EUE, etc.) and are there advantages to some metrics over others? What reliability standards (e.g. one-day-in-ten-

years) should be used for each reliability criterion in capacity accreditation?

9. Are there ways to differentiate between timing of resource additions and the capacity accreditation it receives (*i.e.*, vintaging)?

10. Should the capacity accreditation of each resource technology be determined *ex ante* or should it be determined dynamically as a function of the other resources available?

IV. **Panel 4 – Transmission and Capacity Accreditation:** This panel would address how capacity accreditation of supply-side resources is affected by the underlying transmission network, and whether new transmission assets should be assigned a capacity credit similar to a supply-side resource. This panel will also include topics related to resource interconnection and modeling of transmission in resource adequacy studies.

1. How should deliverability and transmission constraints be considered in resource adequacy models and capacity accreditation?

2. Transmission resources do not typically receive a capacity credit but can improve resource adequacy. Should new transmission resources receive a capacity credit? If so, how?

3. How can transmission limits, congestion, and potential curtailment be better reflected in capacity accreditation?

4. Should capacity accreditation be considered during the transmission interconnection process or determined afterwards based on system conditions during resource adequacy risk periods?

5. How should interregional transmission and external resources (i.e. located in other regions but selling into a different capacity market) be considered in capacity accreditation and capacity market frameworks?

V. **Panel 5 – State and Federal Policy Issues in Capacity Accreditation:** This panel would address how capacity accreditation and market design can either support or hinder the achievement of state and federal policy goals. The topics could include how to best address costs and transparency to better inform policymaking, integrated resource planning, and resource contracting in non-RTO regions.

1. Who is responsible for identifying the system's capacity needs?

2. What is the appropriate reliability criterion to use in setting the system's capacity needs?

3. What methods are available to translated reliability criteria into capacity needs?

4. How can capacity accreditation methods affect state or federal policy around clean energy integration or fossil resource retirements?

5. How can states' resource procurement efforts and markets be better aligned with respect to capacity accreditation?

6. Are seasonal capacity constructs and local capacity requirements useful mechanisms for most closely aligning markets with state and federal policies concerning resource planning and investment?

7. Does one accreditation method work better in jurisdictions that include both a regional capacity market alongside state-level integrated resource planning and utility procurements?