Capacity Auction Reforms: Seasonal/Accreditation (CAR-SA)

Overview of Gas Design

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- During the winter, the quantity of gas available for power generation is limited
- This “regional gas supply constraint” impacts gas resources’ ability to contribute to resource adequacy in the winter
- As part of the Capacity Auction Reforms (CAR), the impact of the regional gas constraint will be reflected in gas capacity compensation through a gas capacity demand curve
- This presentation provides a conceptual overview of the broader gas design

Discussion continues November's material

- ISO presented an overview of its proposed gas design in November
- Today's material is intended to continue that discussion as the ISO seeks stakeholder feedback on the conceptual direction for the design
- In January, the ISO plans to begin technical discussion with material on the proposed methodology for constructing the gas demand curve, where this methodology will use the profiles constructed from Analysis Group's model as an input

Capacity Market Design Objectives

As the ISO has previously outlined, the objectives associated with the capacity market focus on three key areas:

1. Reliability
   - Designing the auction in a manner to satisfy the region's 1-day-in-10 Loss of Load Expectation (LOLE) resource adequacy standard
2. Sustainability
   - Incent the levels of investment, including entry and exit decisions, to meet this standard over time, as system and market conditions change
3. Cost-effectiveness
   - Procuring capacity to meet these objectives in a cost-effective manner

Gas capacity demand curve will help the capacity market to achieve its design objectives

- By reflecting the gas constraint in market clearing, the gas demand curve will help the capacity market to procure capacity that can perform during conditions when resource adequacy is at risk
  - Consistent with the Reliability design objective
- The gas demand curve will help to procure gas capacity most cost-effectively and incentivize resources to make economically efficient firm fuel arrangements
  - Consistent with the Cost-Effectiveness design objective
- The gas demand curve will update year-to-year in response to structural changes in the gas system, or changes in the quantity of firm fuel arrangements made by gas capacity. As a result, the gas demand curve will help to provide efficient market signals over time as system conditions change
  - Consistent with the Sustainability design objective

MOTIVATION FOR GAS DEMAND CURVE DESIGN

Motivation for gas demand curve design

- In January 2024, ISO presented a memo on the proposed gas design under the Resource Capacity Accreditation (RCA) reforms
- Key takeaways from that memo that are still relevant under CAR:
  - The accreditation reforms are intended to help the capacity market achieve its objectives of Reliability, Sustainability, and Cost-Effectiveness by incorporating into resources' capacity market compensation their attributes that impact their ability to contribute to resource adequacy, including their size, forced outage rate, technology type, access to fuel, etc.
  - A resource's capacity market compensation is determined by two factors: the quantity of capacity they can sell (their capacity accreditation) and the price they are paid per unit of cleared capacity
- Key takeaways from January 2024 memo continued on next slide

Motivation for gas demand curve design, cont.

- Most resource attributes that are important for contributions to resource adequacy can be incorporated into the resources' capacity accreditation
- The exceptions are **shared physical constraints**: when a shared physical constraint binds, more energy provided by one resource behind the constraint must come at the expense of the energy provided by another resource behind the constraint
- Incorporating the impact of shared physical constraints into accreditation may not send accurate entry/exit signals to the resources impacted by the constraint, and so may not yield cost-effective outcomes, which could violate the capacity market's Cost-Effectiveness design objective
  - January 2024 memo includes examples that demonstrate this
- Key takeaways from January 2024 memo continued on next slide

Motivation for gas demand curve design, cont.

- Shared physical constraints may be better incorporated into capacity market compensation through the price that resources are paid per unit of cleared capacity
- For example, transmission constraints represent shared physical constraints. Transmission constraints are reflected in resources' capacity market compensation through the price they are paid (the zonal demand curves) and not the quantity of capacity resources can sell (their accreditation)
- Like transmission constraints, the regional gas constraint is also a shared physical constraint: for the non-firm gas resources affected by the constraint, when the constraint binds, more energy provided by one non-firm gas resource must come at the expense of the energy provided by another non-firm gas resource
- More details on the motivation behind the gas demand curve design will be provided in January 2026

OVERVIEW OF PROPOSED GAS DESIGN

Gas design broadly consists of five topics

- Topic 1: Analysis Group's model that predicts the hourly quantity of total gas available for power generation
- Topic 2: Construction of a gas capacity demand curve
- Topic 3: Gas resource accredited capacity calculation
- Topic 4: Determination of "firm" gas contract requirements
- Topic 5: Adjustments to the gas capacity demand curve to reflect firm contracts
- This presentation reflects the ISO's current thinking on the broader gas design
- The ISO welcomes feedback on this framework both now and as the ISO presents the proposed design in the coming months

Topic 1: Analysis Group's gas availability model

- Analysis Group is developing a model that estimates the quantity of gas available for power generation in a given hour
- The model uses information on the region's gas infrastructure and historic gas usage as inputs
  - Similar to how the load forecast process uses historic load and weather data to generate load profiles for the Resource Adequacy Assessment process
- The outputs from this model serve as the primary input to the calculation of the gas capacity demand curve
- Analysis Group provided an overview of their model in November, and is providing an initial set of results in December

Topic 1, Gas availability model's uses

- **Analysis Group's model will be used to:**
  - Calculate the MRI curves that are needed to construct the gas demand curve in Topic 2
- **Analysis Group's model will not be used to:**
  - Determine the seasonal LOLE target in the winter
  - Calculate the winter Net Installed Capacity Requirement (Net ICR)
  - Accredit gas or dual fuel resources

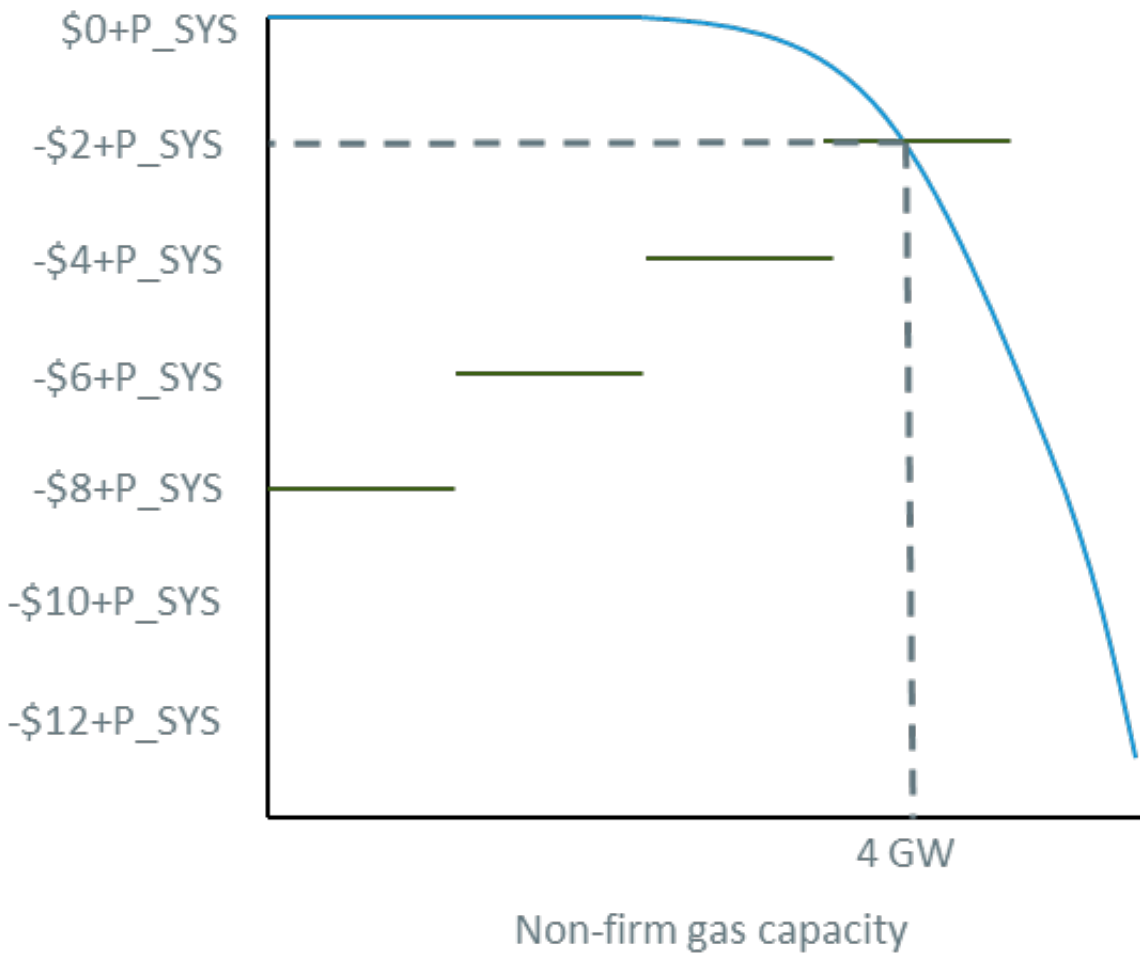
Topic 1, Annual updates to the gas availability model

- To account for changes in the regional gas pipeline system or gas supply, annual updates to the gas availability model are expected
- The exact details of these updates, including their timeline, are to be determined

Topic 2: Construction of the gas capacity demand curves

- With the outputs from Analysis Group's gas availability model and the demand curve scaling factor, the ISO will construct a gas capacity demand curve to reflect the diminishing reliability impact of non-firm capacity due to the system-wide gas constraint
- The gas capacity demand curve is analogous to the existing export-constrained capacity demand curve design
  - ISO will construct a non-firm gas capacity MRI curve by measuring the reliability impact of substituting incremental MW of non-firm gas capacity with other capacity in the system
  - The resulting gas capacity MRI curve will be calibrated by the demand curve scaling factor to yield a non-firm gas capacity demand curve
- ISO to present detailed material on the construction of the gas demand curve in January
- **Next:** a figure provides an example gas capacity demand curve with gas capacity clearing quantity and price

Topic 2, cont.: Example gas capacity demand curve



- The downward-sloping blue curve represents the gas capacity demand curve
- The horizontal green lines reflect the winter capacity market offers of the gas-only resources without firm fuel arrangements
- In conjunction with the simultaneous clearing of the system-wide demand curve, the intersection of the gas capacity supply and demand curves determines how much non-firm gas-only CSO will be awarded and how much less that CSO will be paid
- Assuming a system price of $6, 4 GW of non-firm gas-only capacity would be awarded a CSO, and that CSO would be paid a price = $6 - $2 = $4
- Gas resources will be paid a lower price in the winter months when there are more gas resources than can be expected to reliably perform during MRI Hours

Topic 3: Gas resource accredited capacity calculation

- Gas resources' accredited capacity values will not be impacted by the regional gas constraint
  - I.e., the impact the regional gas constraint has on gas resource expected resource adequacy contributions will be accounted for in the price paid to gas resources without firm contracts, not in their accredited capacity
- Gas resource accreditation will be driven by their MCap, EFORd values, and deliverability like the non-energy limited thermal resources
- The process for accrediting the gas and dual fuel resources will be discussed in January 2026

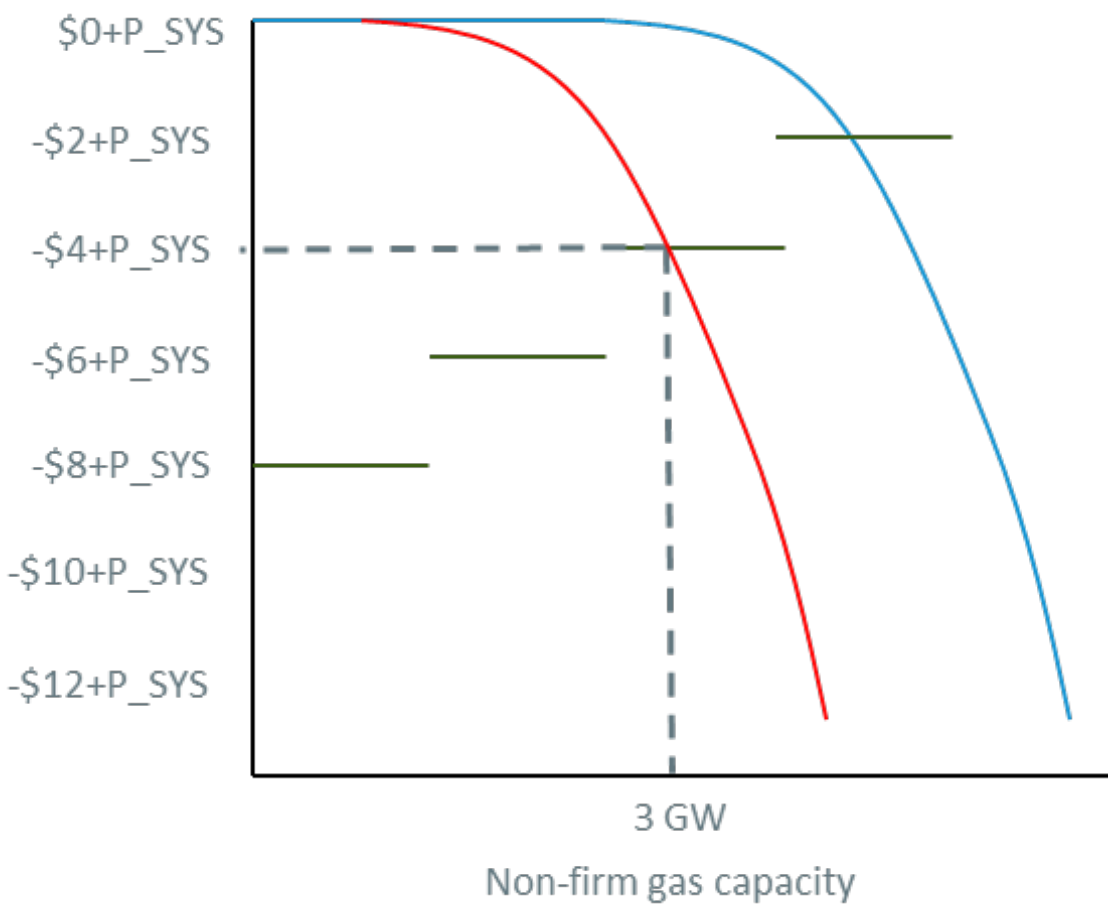
Topic 4: Determination of firm gas contract requirements

- Gas resources that make firm fuel arrangements can exempt some or all their accredited capacity from the lower price paid to gas capacity
- Analysis Group is working to determine the per MW of accredited capacity contract requirements for firm fuel arrangements
- Analysis Group will outline proposed firm contract requirements, with April 2026 as the target date for those discussions

Topic 5: Adjustments to the gas capacity demand curve to reflect firm contracts

- Firm contracts made by gas resources (and submitted to the ISO for verification) may shift the gas capacity demand curve to the left
- Conceptually, as gas resources make contracts to firm their fuel supply, the remaining gas that is available for power generation by gas resources without firm contracts may decrease
- As a result, the expected resource adequacy contributions of the gas resources without firm contracts may decrease as more contracts are made
- **Next:** Figure 2 demonstrates how firm gas contracts would shift the gas capacity demand curve from the previous example

Topic 5, cont.: Firm gas contracts shift gas capacity demand curve to the left



- Firm gas contracts shift the gas capacity demand curve to the left: the downward-sloping red line now represents the non-firm gas-only capacity demand curve
- With this new demand curve, less non-firm gas capacity sells CSO (3 GW) and the non-firm gas CSO receives a lower price (assuming a $6 system price, the non-firm gas CSO would be paid $6 - $4 = $2)

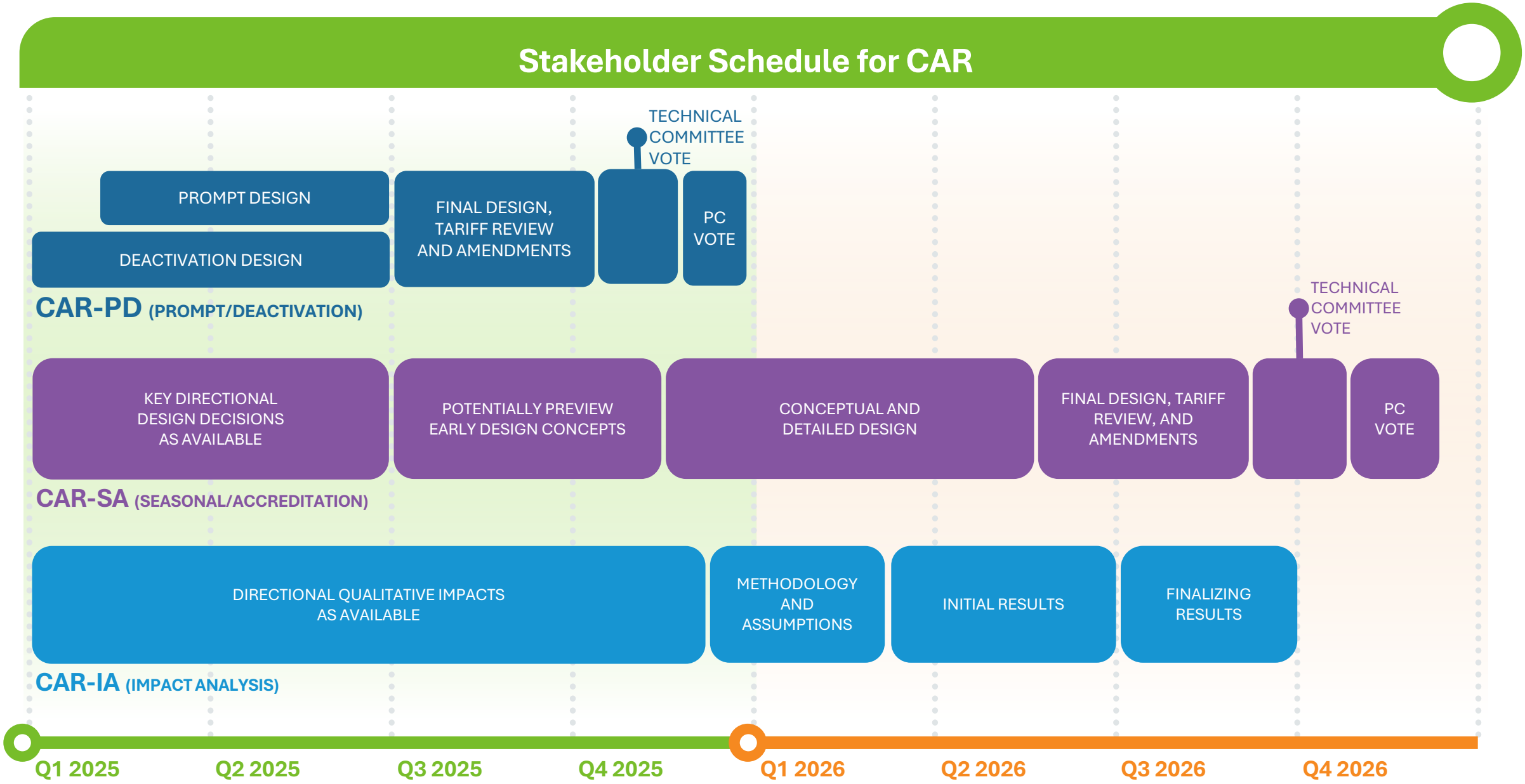
Next steps

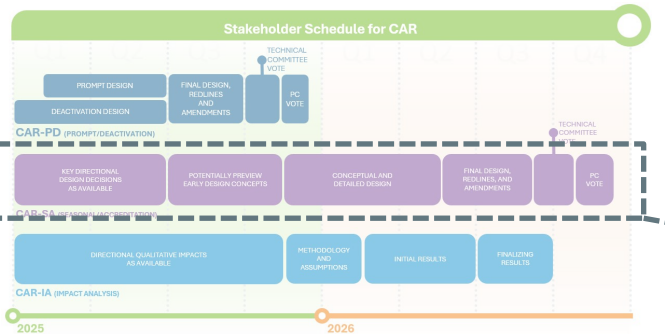
- After this presentation, AG will follow up on their November presentation with results from their daily gas availability model (Topic 1)
- ISO will begin the detailed design discussion on the construction of the gas capacity demand curve in January 2026 (Topic 2)
- ISO will also present on the accredited capacity calculations for gas-only and dual fuel resources in January 2026 (Topic 3)
- AG and ISO will present on firm gas contract requirements, and the impact such contracts have on the gas demand curve, starting in April 2026 (Topics 4 and 5)

Questions

STAKEHOLDER SCHEDULE

Stakeholder Schedule for CAR





Stakeholder Schedule for CAR-SA

CORE MODELING AND ACCREDITATION CONCEPTS

SEASONAL/ACCREDITATION MODELING AND MARKET DESIGN

CONFORMING DESIGN DETAILS

FINAL DESIGN, TARIFF REVIEW AND AMENDMENTS

TECHNICAL COMMITTEE VOTE

PC VOTE

CAR-SA (SEASONAL/ACCREDITATION)

PROVIDE QUESTIONS AND FEEDBACK ON DESIGN

CONCEPTUAL AMENDMENTS

PRESENT AMENDMENTS

Stakeholder Activity

PRESENT DESIGN & RESPOND TO FEEDBACK

PROVIDE QUESTIONS AND FEEDBACK ON AMENDMENTS

ISO Activity

Q4 2025 | **Q1 2026** | **Q2 2026** | **Q3 2026** | **Q4 2026**

CAR-SA Schedule Projection

- **December**
  - Seasonal Market Design Concepts and Risk Split (MC timeframe)
  - Gas Availability Study Follow-up with Analysis Group (MC timeframe)
  - Gas Market Constraint Conceptual Introduction (MC timeframe)
  - Overview of Impact Analysis Plan (MC timeframe)
  - Energy Storage Resource Modeling and Accreditation (Includes Pumped Hydro) (RC timeframe)
  - Seasonal Tie Benefits (RC timeframe)
- **January**
  - Gas Market Constraint Design Detail and Gas-only Resource Modeling and Accreditation (MC timeframe)
  - Intermittent Power Resource Modeling and Accreditation (includes run-of-river hydro) (MC timeframe)
  - Energy Limited Resource Modeling and Accreditation, Continued (Dual Fuel) (MC timeframe)
  - Q4 Follow-up Medley (MC timeframe)
  - Seasonal Tie Benefits (RC timeframe)

All NEPOOL members are invited to attend meetings where CAR topics are discussed

CAR-SA Preliminary Topic Schedule: February and Beyond

- The list below provides a projection of when core accreditation committee discussions will begin:

Topics	Projected Committee Discussions
Import Resource Modeling and Accreditation	February
Modeling Deliverability: Summary of All Resource Types	February
Hybrid Resource Modeling and Accreditation	February – March

CAR-SA Preliminary Topic Schedule: February and Beyond (Continued)

- The list below provides a projection of when core accreditation committee discussions will begin:

Topics	Projected Committee Discussions
ICR and Seasonal Demand Curve Estimation	February – March
Impact Analysis Initial Results	March – June
Q1 Follow-up Medley	April
Gas-only Resource Contract Requirements	April – May