Resource Capacity Accreditation in the Forward Capacity Market

Updated impact analysis framework

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Resource Capacity Accreditation in the Forward Capacity Market

WMPP ID: 157

Proposed Effective Date: FCA 19

- The Resource Capacity Accreditation (RCA) project proposes improvements to ISO-NE's accreditation processes in the Forward Capacity Market (FCM) to further support a reliable, clean-energy transition by implementing methodologies that will more appropriately accredit resource contributions to resource adequacy as the resource mix transforms
- An impact analysis will be conducted with the objective to provide resource accreditation and capacity market insights into the RCA design
- This presentation provides updates to the scope, approach, and assumptions of the impact analysis

Outline of today's discussion:

- Impact analysis update overview (slides 4-10)
- Base Case Resource Accreditation Update (slides 11-13)
- Resource Accreditation Sensitivity Update (slides 14-19)
- Base Case Capacity Market Impact Update (slides 20-21)
- Conclusion (slides 22-24)
- Stakeholder Schedule (slides 25-28)

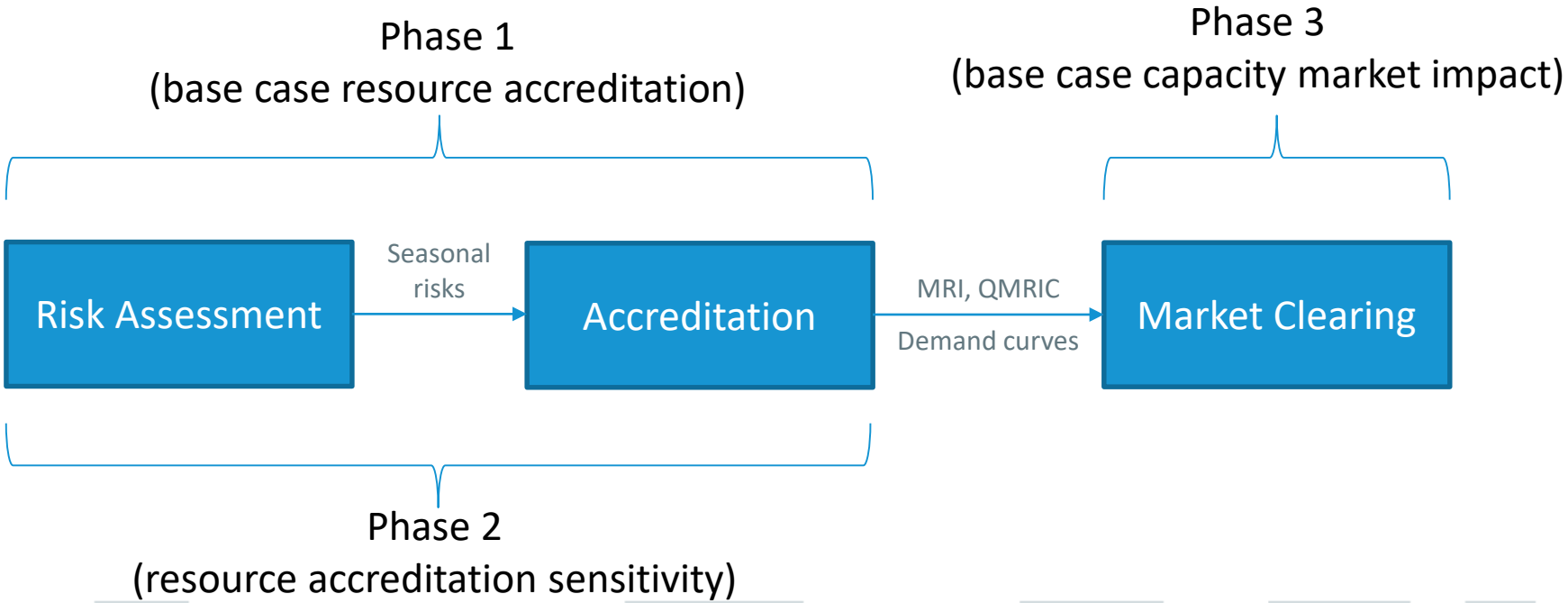
IMPACT ANALYSIS UPDATE OVERVIEW

Overview

- The impact analysis aims to provide quantitative insights into the RCA design
- The updated impact analysis will still be conducted in 3 phases (reordered)
  - Phase 1: Base Case Resource Accreditation
  - Phase 2: Resource Accreditation Sensitivity
  - Phase 3: Base Case Capacity Market Impact
- Updated Phase 1 results will mirror pre-software fix results provided at the April 2023 MC meeting
- Anticipated Phase 2 insight areas were summarized at the September 2022 MC meeting
  - Capacity Supply Obligations (CSOs) for each resource class
  - System capacity prices
  - Total capacity market cost
  - LOLE implied by cleared resource mix

Current Impact Analysis Process

- The high-level analysis process remains the same

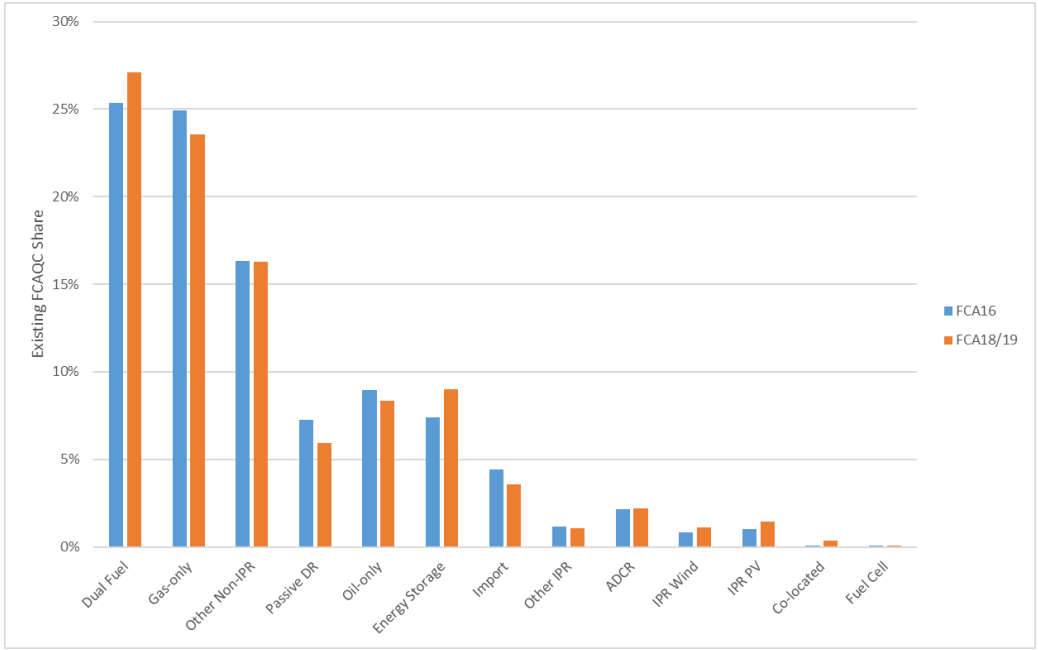


Significant Changes

- Original Base Case – FCA 16
  - Accredit **FCA 16** resources
  - Model gas resources as **pipeline output + LNG storage**
  - Model **FCA 16**-cleared imports
  - Scale load profile by **FCA 16** load forecast
  - Operating hour requirements (see April 2023 MC presentation)
    - DOHR (Daily Operating Hours Requirement) = 10 hours/day
    - SOHR (Seasonal Operating Hours Requirement) = 110 hours (11 days @ DOHR)
    - FSHR (Fuel Storage Hours Requirement) = 40 hours (4 days @ DOHR)
- Updated Base Case – FCA 18/19
  - Accredit **FCA 18** resources
  - Model gas resources **as gas fleet output profile** (see December 2023 MC presentation)
  - Model **FCA 13**-cleared imports
    - FCA 13-cleared imports are median import clearing over past 5 FCAs (see December 2023 RC presentation)
  - Scale load profile by **FCA 19** load forecast
  - Operating hour requirements **TBD**

Resource Mix Change

- Compared to FCA 16, the updated FCA 18/19 base case has a higher percentage of dual fuel, storage, intermittent, and co-located resources
  - Note: “Co-located” only covers Configuration 3 (single non-IPR resource) in this figure



Summer Load Forecast Change

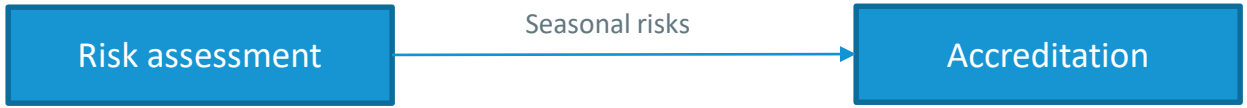
	Original Base Case (FCA 16)	Updated Base Case (FCA 18/19)
Gross Summer Peak Load	29,000 MW	28,832 MW
Peak Reduction from Behind-the-Meter PV	975 MW	1,084 MW
Peak Reduction from Energy Efficiency	3,473 MW	2,441 MW
Net Summer Peak Load	24,552 MW	25,307 MW

Winter Load Forecast Change

	Original Base Case (FCA 16)	Updated Base Case (FCA 18/19)
Gross Winter Peak Load	22,989 MW	24,896 MW
Peak Reduction from Behind-the-Meter PV	0 MW	0 MW
Peak Reduction from Energy Efficiency	3,216 MW	2,318 MW
Net Winter Peak Load	19,774 MW	22,578 MW

PHASE 1 (BASE CASE RESOURCE ACCREDITATION) UPDATE

Winter Modeling Changes



Original	Gas resources → **Pipeline + seasonal LNG storage** RFO resources → Derated resources DFO resources → **Derated resources**	Gas resources → **Derated resources** RFO resources → Derated resources DFO resources → Derated resources
Update	Gas resources → **Gas fleet output profile** RFO resources → Derated resources DFO resources → **Aggregate 2-week energy limit**	Gas resources → **Gas fleet output profile** RFO resources → Derated resources DFO resources → Derated resources

Accreditation Methodology Changes

- Gas fleet QMRIC is allocated to individual resources as described at the December 2023 MC meeting
- Linear MRI interpolation used to accredit energy storage resources with durations that fall between proxy storage durations
- Co-located resource accreditation TBD

PHASE 2 (RESOURCE ACCREDITATION SENSITIVITY) UPDATE

Overview

- Resource accreditation uses GE MARS model
- Key inputs to the updated GE MARS model for accreditation
  - Resource mix
  - Load forecast
  - Gas fleet output profile in winter
  - 2-week DFO energy limit
- Accreditation based on the FCA 18/19 case will constitute the “base case” outcome
- Sensitivity scenarios will be constructed to provide insight into how different system changes may affect accreditation
  - Only Phase 1 (risk assessment + accreditation) will be rerun

Sensitivity to Resource Mix

- Based on the ISO's Interconnection Request Queue, renewable and storage resources are expected to replace fossil resources
  - **Scenarios 1 and 2** will study different levels of resource replacement
- It was previously suggested that the ISO also study the impact of renewable additions without fossil retirements
  - **Scenario 3** will study this situation
- In Scenarios 1-3, the resource "replacement rate" will be based on the Future Grid Reliability Study Scenario 1

Sensitivity to Load Forecast

- ISO New England expects to be winter peaking by the mid-2030s (see 2023 Regional System Plan)
- **Scenario 4** will increase the winter load forecast to analyze the impact of shifting from a summer peaking to winter peaking system

Gas Fleet Output Profile Discussion

- The gas fleet output profile was derived from historical pipeline infrastructure data
- Because the New England gas pipeline infrastructure is not expected to change, the ISO does not think a sensitivity scenario is warranted

Two-week DFO Energy Limit Discussion

- Two-week oil inventory **only** affects resource accreditation through the seasonal risk split

$$Seasonal\ QMRIC = Seasonal\ Capacity \times \frac{Seasonal\ MRI}{Seasonal\ MRI_{perfect}} \times \frac{Seasonal\ MRI_{perfect}}{Annual\ MRI_{perfect}}$$

Seasonal performance during hours impacting EUE

Seasonal risk

- Scenario 2, which will retire some DFO resources and their contributions to the two-week DFO energy limit, will provide insight into how the two-week DFO energy limit affects the seasonal risk split
- Scenario 4 will also provide accreditation insight into seasonal risk split impacts

PHASE 3 (BASE CASE CAPACITY MARKET IMPACT) UPDATE

No Phase 3 Changes Needed

- The capacity market impact analysis follows the original proposal
  - Step 1. Baseline clearing
    - Generate new QC-based system demand curve
      - FCA 18 demand curve cannot be used because of resource modeling and load forecast changes
    - Clear QC-based market
  - Step 2. RCA clearing
    - Adjust FCA 18 supply offers to QMRIC
      - QMRIC quantity = QC quantity x rMRI
      - QMRIC price = QC offer price / rMRI
    - Adjust new QC-based system demand curve to QMRIC
      - QMRIC quantity = QC quantity x Conversion Factor
      - QMRIC price = QC offer price / Conversion Factor
    - Clear QMRIC-based market

CONCLUSION

Summary of Updated Impact Analysis

- The impact analysis will provide resource accreditation and capacity market insights into the RCA design
- Three phases
  - Phase 1: Base Case Resource Accreditation
  - Phase 2: Resource Accreditation Sensitivity
  - Phase 3: Base Case Capacity Market Impact
- Phase 1 will study the FCA 18/19 case and sensitivity variations
- Phase 2 will study the FCA 18/19 case

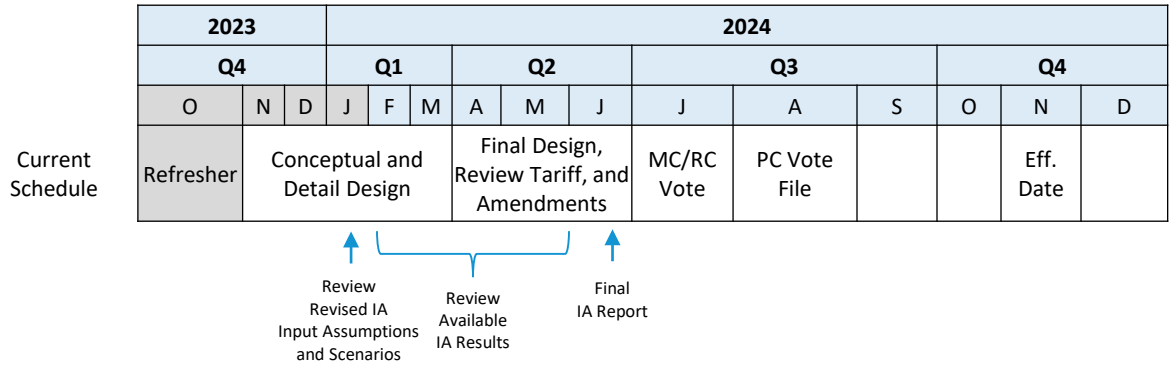
Projected Result Timeline

- Phase 1
  - FCA 18/19 baseline: February 2024
  - Sensitivity scenarios: Starting March 2024
- Phase 2 results cannot be produced until after FCA 18 is conducted (supply offers are needed to clear the market)
  - April 2024

STAKEHOLDER SCHEDULE

Stakeholder Process - Overview

- There are several broad phases laid out in the stakeholder process:
  - RCA Refresher: October 2023
  - Conceptual & Detailed Design: November 2023 – March 2024
  - Finalize Design, Review Tariff Language, and Stakeholder Amendments: April 2024 – June 2024
  - Voting: July 2024 (Technical Committees) and August 2024 (Participants Committee)
- In addition, there are several key dates for the revised impact analysis projected in the process:
  - January 2024: Review revised input assumptions and scenarios
  - February 2024 – May 2024: Review available results
  - June 2024: Final report



Parallel Stakeholder Processes

- While the ISO continues to evaluate plans of moving to prompt and/or seasonal auctions for CCP 19 and beyond, it is still developing and preparing to implement RCA for CCP 19 with the auction delayed to 2026
- Below are the parallel stakeholder processes associated, with initial target dates, associated with these FCA 19-related efforts

	2023			2024												
	Q4			Q1			Q2			Q3			Q4			
	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	
RCA Forward, Annual (for FCA 19 with One-Year Delay)	Refresher	Conceptual and Detail Design					Final Design, Review Tariff, and Amendments			MC/RC Vote	PC Vote; File			Eff. Date		
FCA 19 One-Year Delay	Review Tariff; MC Vote	PC Vote; File		Eff. Date												
Alternative FCM Commitment Horizons	Analysis - Scope & Methodology		Analysis Findings & Stakeholder Feedback	ISO recommendation on whether to develop prompt proposal _____ If ISO recommends developing a prompt proposal, introduce FCA 19 additional delay		MC Vote on additional FCA 19 delay	PC Vote on additional FCA 19 delay; File		Eff. Date							

Questions