Forward Capacity Market (FCM) / Generator Interconnection Process Stakeholder Group

Stakeholder Meeting No. 8

March 14, 2008

Springfield, MA

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Agenda

• Welcome and Introductions	10:00 – 10:15
• Continued discussions on ISO straw proposals – Treatment of long lead-time proposals – Intra-zonal deliverability standard – “Conditional Qualification” of resources	10:15 – 12:15
• Lunch	12:15 – 1:00
• Straw proposal discussions, continued	1:00 – 2:30
• Next steps and process for developing a term sheet/ design basis document	2:30 – 3:00
• Adjourn	3:00

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Schedule

- **Stakeholder Study Group:** September 2007 – May 2008
  - March 14
  - March 25
  - April 10
  - May 2
  - May 16
- **Markets/Reliability/Transmission Committees**
  - Discussion: May - July
  - Reliability Committee/Transmission Committee vote: July 21-22
  - Markets Committee vote: August 11-13 (summer meeting)
- **Participants Committee Vote:** September 5
- **Filing:** October

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Objectives

- Address Connecticut's concern for possible "sub-optimal" auction results
  - Use "Conditional" Resource Qualification to allow more competition within the auction
- Include "Overlapping Impact" deliverability standard in the Open Access Transmission Tariff (OATT) Large/Small Generator Interconnection Procedures (LGIP/SGIP)
  - Apply "study group" approach to link with each primary auction (annual re-configuration auction) set of resources
- Accommodate "Long Lead Time" resources via more rigid milestones and Financial Assurance
  - Provide "deliverability certainty" via tariff mechanisms

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Objectives (cont.)

- Develop solutions that are consistent with principles identified by the study group
  - For example
    - Improve the efficiency and coordination of the FCM and Generator Interconnection Processes
    - Transparency
    - Incorporate intra-zonal deliverability
- Principles are posted in full with today's meeting materials

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Interconnection Process Discussion of Approach in Other Regions

Al McBride, Project Manager, New Resource Qualification
Rich Kowalski, Manager, Transmission Planning

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The Use of Milestones in The PJM Interconnection Process (PJM OATT)

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PJM Interconnection Process Milestones

- **206.1 Study Agreement**: ……. The Facilities Study Agreement also may contain reasonable milestone dates that an Interconnection Customer's project must meet for the customer's Interconnection Request to retain its assigned Queue Position pursuant to Section 201 while the Transmission Provider is completing the Facilities Study.

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PJM Interconnection Process Milestones (cont.)

- **212.4 Retaining Priority and Security**: …. (a) In addition, to retain the assigned *(queue position)* priority, within sixty (60) days after receipt of the Facilities Study (or, if no Facilities Study was required, after receipt of the System Impact Study), the Interconnection Customer must have met the milestones specified in Section 212.5.

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PJM Interconnection Process Milestones (cont.)

- **212.4 Retaining Priority and Security (cont.)**: [c] If an Interconnection Customer fails to timely execute the Interconnection Service Agreement (or request dispute resolution or that the agreement be filed unexecuted), meet the milestones (unless extended) set forth in Section 212.5, or provide the security prescribed in this Section 212.4, its Interconnection Request shall be deemed terminated and withdrawn.

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PJM Interconnection Process Milestones (cont.)

- **212.5 Milestones**: In order to proceed with an Interconnection Service Agreement, within 60 days after receipt of the Facilities Study (or, if no Facilities Study was required, after receipt of the System Impact Study), a Generation Interconnection Customer must demonstrate that it has
  i. entered a fuel delivery agreement and water agreement, if necessary, and that it controls any necessary rights-of-way for fuel and water interconnections,
  ii. obtained any necessary local, county, and state site permits, and
  iii. signed a memorandum of understanding for the acquisition of major equipment

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PJM Interconnection Process Milestones

- **212.5 Milestones (cont.)**
  - The Transmission Provider also may include other reasonable milestone dates in the Interconnection Service Agreement for the construction of the Interconnection Customer's generation project that, if not met, shall relieve the Transmission Provider and the Transmission Owners from the requirement to construct the necessary facilities and upgrades and be deemed a termination and withdrawal of the Interconnection Request.
  - Such milestones may include site acquisition, permitting, regulatory certifications (if required), acquisition of any necessary third-party financial commitments, commercial operation, and similar events.

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PJM Interconnection Process Milestones

- **212.5 Milestones (cont.)**
  - The Transmission Provider may reasonably extend any such milestone dates (including those required in order to proceed with an Interconnection Service Agreement) in the event of delays not caused by the Interconnection Customer, such as unforeseen regulatory or construction delays that could not be remedied by the Interconnection Customer through the exercise of due diligence.

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PJM Interconnection Process Milestones

- **ATTACHMENT O**
- **FORM OF INTERCONNECTION SERVICE AGREEMENT (ISA)**
  - Project Specific Milestones. In addition to the milestones stated in Section 212.5 of the Tariff, as applicable, during the term of this ISA, Interconnection Customer shall ensure that it meets each of the following development milestones
    - 6.1 Substantial Site work completed. On or before _____Interconnection Customer must demonstrate completion of at least 20% of project site construction
    - 6.2 Delivery of major electrical equipment. On or before _____,Interconnection Customer must demonstrate that __ generating units have been delivered to Interconnection Customer's project site
    - 6.3 Commercial Operation. (i) On or before _____, Interconnection Customer must demonstrate commercial operation of __ generating units; (ii) On or before _____, Interconnection Customer must demonstrate commercial operation of __ additional generating units

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California ISO
Initiative to Revise Queue Process
(Draft Proposal Dated February 12, 2008)

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Background to the CAISO Initiative

- Over the past few years, several factors, largely unanticipated at the time of Order No. 2003's adoption, including the very large number of Interconnection Requests (IR) for renewable generation, have imposed significant challenges to the efficiency of the present "serial" generation interconnection study approach in California
- The CAISO currently has 188 active IRs totaling 62,608 MW (42,526 MW renewable) for a system with a historic peak of 50,270 MW
- The large number of requests and high level of MW capacity in the CAISO Controlled Grid Generation Interconnection Queue (CAISO Queue) have overwhelmed available resources, led to delays and frustration with the study process, and exposed, or reinforced, fundamental deficiencies in the current LGIP
- FERC has also acknowledged the existence of challenges to the LGIP and held a technical conference on December 11, 2007 in Docket No. AD08-02-000

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CAISO Stakeholder Process – Reform Concept Features

- The paradigm of the existing LGIP, which relies on serial studies based on queue position, is proposed to be abandoned in favor of a more streamlined approach
- Features of the original Issues Paper included
  - An annual queue cluster window
  - Increased Interconnection Customer financial and other commitments and consequences for delay or withdrawal
  - Perform group studies (CAISO discretion to individually study electrically remote facilities)
  - A two study phase process
  - Binding financial commitment required for signing an Interconnection Agreement (IA)
  - Projects with executed Interconnection Agreements are an input to the Transmission Planning Process

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CAISO Stakeholder Process – New Features of the Interconnection Request (IR)

- Interconnection Customer (IC) must provide detailed maps and the project's proposed service interconnection point
- Interconnection Customer Demonstrate proof of Site Control through the project's proposed Commercial Operation Date plus three years (the additional three years is to allow for unforeseen construction delays)
- The IC may post a $250,000 deposit in lieu of Site Control
  - The deposit would be forfeited if the project withdraws subsequent to signing an Interconnection Agreement

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CAISO Stakeholder Process – New Features of the Interconnection Request (cont.)

- The IC shall make a $250,000 deposit to cover costs of processing the IR and conducting studies
  - This deposit is non-refundable if the IC withdraws its project prior to signing an IA
  - Upon execution of an IA, the deposit net any administrative and study costs incurred will be refunded
- The IC shall specify their requested deliverability status, either full capacity or energy only
  - The Deliverability Assessment will be performed at peak conditions in accordance with the CAISO deliverability analysis developed to implement the state's resource adequacy requirements

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CAISO Stakeholder Process – New Features of the Interconnection Request (cont.)

- Each IC shall submit all required technical data with their IR
  - Lack of technical data has been a cause for delays in the serial study process and likewise will delay completion of individual and group studies under a clustered approach
- The IC would identify the project's preferred Point of Interconnection (POI) and preferred voltage level
  - IC would only identify one POI in the IR; however this POI may change during the Scoping Meeting

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CAISO Stakeholder Process – New Features of the Interconnection Request (cont.)

- The IC is requested to identify whether its proposed project is in response to a specific Utility Request for Offer (RFO)
  - By providing this information, the IC authorizes the CAISO to utilize this information for limiting the total amount of generation associated with the RFO to be studied on a simultaneous basis
  - Modeling of IRs not associated with the RFO will not be subject to this limitation
- To the extent that a state sponsored process identifies maximum developable installed capacity for specified regions, the CAISO's study assumptions will apply such maximum installed capacity quantities

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ISO New England:

1. Long Lead-Time Issues
2. Insights from the FCM Qualification Process

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"Long Lead-Time" Capacity Resources: Proposal Concepts

- Allow advance opportunity to study and "secure" transmission plans/obligations sufficient for FCM participation via LGIP process
- Allow participation in "near-term" Forward Capacity Auction (FCA) Overlapping Impact analysis
- Rigorous requirements to maintain status
  - Rigid milestones for project progress
    - Fuel contracts
    - Permits
    - Equipment contracts
    - FCM milestones
  - Financial commitment in advance of "normal" FCA participation
  - Commitment to system improvement
    - Begin immediate transmission construction (minimize uncertainty for other projects)
    - Substantial deposits (non-refundable?) for transmission construction
    - Time/milestone-based deposits for transmission construction

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Insights from the First Qualification Process

- As FCM Qualification proceeded a reduction was observed in the amount of New Generation Capacity that was continuing to actively pursue qualification and participation in the FCA
- Reductions were noticed after
  - Show of Interest window closed and Qualification Process Cost Reimbursement Deposit was collected
  - Critical Path Schedule & Site Control deadline
  - Qualification Outcome
  - Financial Assurance Posting
  - FCA itself

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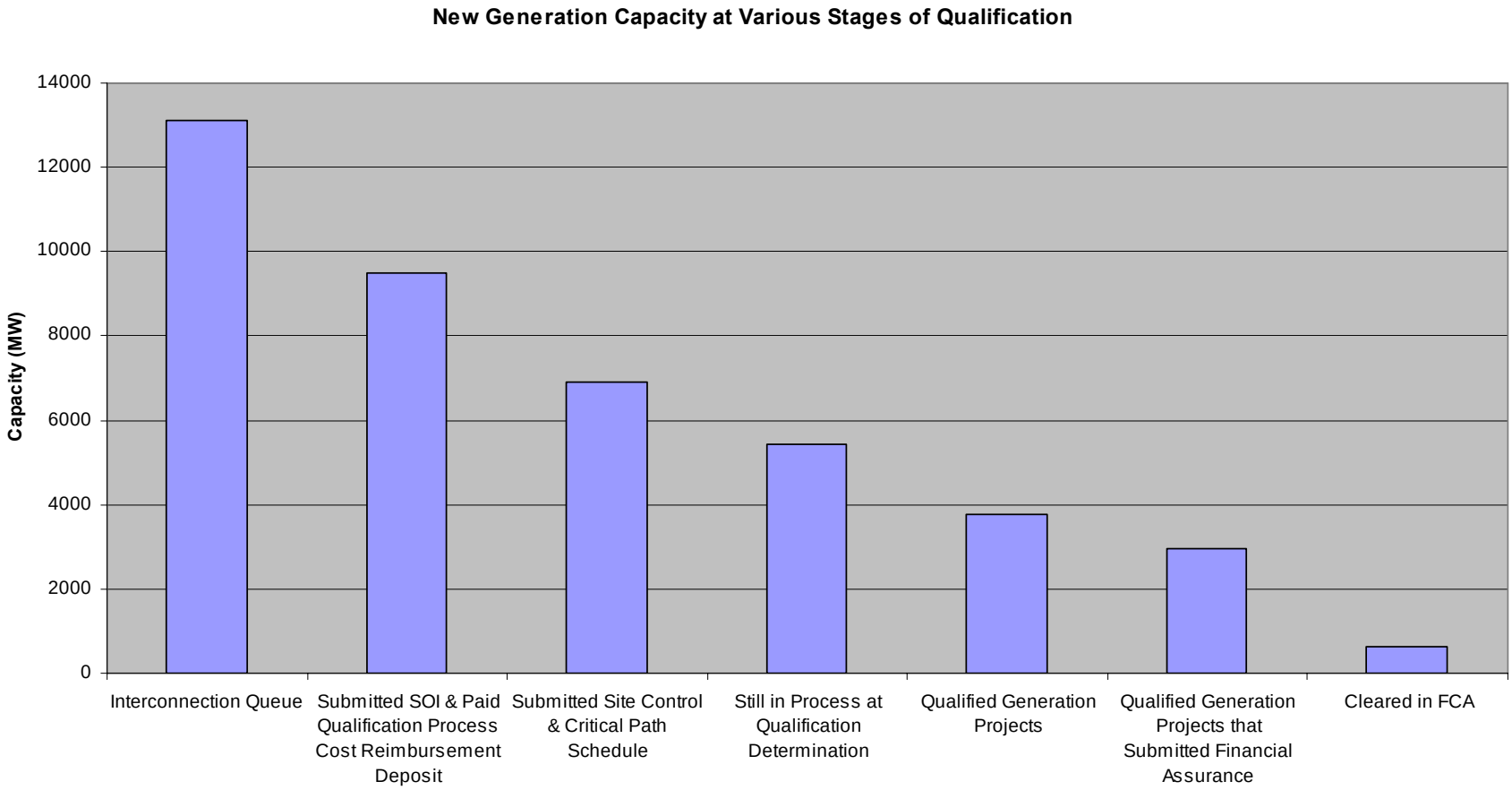
Insights from the First Qualification Process (cont.)



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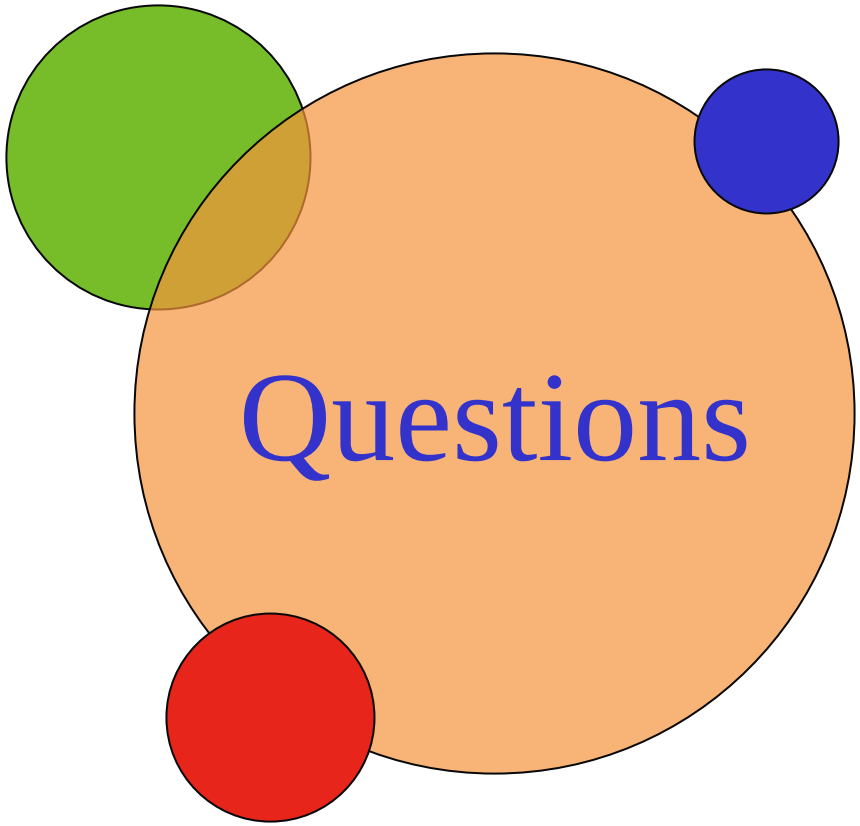

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Straw Proposal Component #2: Include "Overlapping Impact" Deliverability Standard in the OATT LGIP/SGIP

Rich Kowalski, Manager, Transmission Planning
Al McBride, Project Manager, New Resource Qualification

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“Deliverability” Study Objectives

- Identify the upgrades necessary for a generator selected in the FCA to be incrementally useful (deliverable)
- The smaller the population of prior queued generators that need to be considered, the smaller the uncertainty of upgrades for later resources
  - More useful studies; fewer prior queued generators that will not proceed to construction
  - Generator has more useful information for bidding
  - Generator can better postulate conditions for optional studies
  - More useful information for generator pre-qualification evaluation

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“Deliverability” Study Stages

- Only generators in a specific FCA studied together, use milestones, such as posting Financial Assurance to screen participation and reduce study group participants
- First “Stage” – Deliverability requirements determined for study group in relative queue order (Feasibility “Level” type of study)
  - Pre-Qualification review of likelihood of meeting schedule, based on queue order
- Second “Stage” – Generator can elect to perform optional study based on their assumptions (Feasibility “Level” type of study)
  - Pre-Qualification review of likelihood of meeting schedule, based on generator assumptions
  - Require additional Financial Assurance
- Third “Stage” – Restudy of all generators that cleared in the FCA
  - “Update” upgrades based on relative queue order
  - May substantially shift upgrade responsibility relative to First Stage
- Will need provision for other generators to maintain involvement/secure deliverability upgrades
- Timing is going to be challenging: sequencing auctions and studies; study durations

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“Deliverability” Study Examples

Disclaimer –

- Examples are intended to be simple to demonstrate concepts
- The “real” world is usually much more complicated
- Generators and their upgrades to achieve deliverability are rarely interchangeable
- Examples don’t explicitly address long lead-time units or other means to secure deliverability upgrades

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Current Process with Conditional Qualification – Example 1A

- Basic Interconnection
  - Minimum Interconnection Standard (MIS) based on queue order
- Study to Determine Deliverability Upgrades
  - None required (Elective Expansion available option)
- FCA Qualification Screening
  - Verify MIS & Overlapping impact (include gen-specific elective upgrades) based on queue order, FCA participation
  - GenB conditionally qualifies vs. GenA (Part I of ISO Straw Proposal)
- Situation
  - GenA is qualified
  - GenB with lower Queue Position conditionally qualified due to overlapping impact
  - If GenA clears in the FCA, GenB will not be allowed to clear
  - GenB is reviewed in the 2nd FCA with GenA (and other FCA winners) as Existing
- Observations/Results
  - Queued GenA gets MIS priority
  - GenA that clears in FCA gets overlapping impact “priority” by virtue of queue priority and FCA bid
  - GenB may still not qualify in 2nd FCA due to overlapping impact on GenA
  - GenB needs opportunity to study/remedy deliverability
  - GenB does not know whether to study deliverability with or without GenA (or other prior queued resources) or with or without GenA deliverability upgrades

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Current Process with Conditional Qualification – Example 1B

- Basic Interconnection
  - MIS based on queue order
- Study to Determine Deliverability Upgrades
  - None required (Elective Expansion available option)
- FCA Qualification Screening
  - Verify MIS & Overlapping impact (include gen-specific elective upgrades) based on queue order, FCA participation
  - GenB conditionally qualifies vs. GenA
- Situation
  - GenA could withdraw after qualification or withdraw during the FCA
  - If GenB clears in the 1st FCA, then GenA is studied for Overlapping Impacts in the 2nd FCA with GenB (and other FCA winners) as Existing
- Observations/Results
  - Queued GenA gets MIS priority
  - GenB that clears in FCA gets overlapping impact "priority" by virtue of FCA bid
  - GenA may not qualify in 2nd FCA due to overlapping impact on GenB
  - GenB LGIP – MIS interconnection costs are still dependent (in part) on GenA
  - GenA needs opportunity to study/remedy deliverability with existing 1st FCA winners

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Proposed Process – Example 2A

- Basic Interconnection
  - MIS based on queue order
- Study to Determine Deliverability Upgrades
  - Group Deliverability Required for FCA participation, based on queue order
- FCA Qualification Screening
  - Verify MIS & Overlapping impact (include gen-specific elective upgrades) based on queue order, FCA participation
  - Is overlapping impact screening still necessary?
  - Can GenB conditionally qualify vs. GenA without GenB upgrades?
- Situation
  - GenA is qualified without upgrades
  - GenB with lower Queue Position qualified with upgrades due to GenA
  - GenA & GenB clear in the FCA
- Observations/Results
  - Queued GenA & GenB maintain queue MIS priority
  - GenA (&GenB) that clears in FCA gets overlapping impact “priority” by virtue of queue priority and FCA bid

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Proposed Process – Example 2B

- Basic Interconnection
  - MIS based on queue order
- Study to Determine Deliverability Upgrades
  - Group Deliverability Required for FCA participation, based on queue order
- FCA Qualification Screening
  - Verify MIS & Overlapping impact (include gen-specific elective upgrades) based on queue order, FCA participation
  - Is overlapping impact screening still necessary?
  - Can GenB conditionally qualify vs. GenA without GenB upgrades?
- Situation
  - GenA is qualified without upgrades
  - GenB with lower Queue Position qualified with upgrades due to GenA
  - GenA clears in the FCA, GenB does not clear
- Observations/Results
  - Queued GenA gets MIS priority
  - GenA that clears in FCA gets overlapping impact “priority” by virtue of queue priority and FCA bid
  - GenB may no longer qualify in 2nd FCA due to new overlapping impact on GenA (and other FCA winners)
  - GenB needs opportunity to study/remedy deliverability for 2nd FCA (can participate in 2nd FCA Group Deliverability analysis)

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Proposed Process – Example 2C

- Basic Interconnection
  - MIS based on queue order
- Study to Determine Deliverability Upgrades
  - Group Deliverability Required for FCA participation, based on queue order
- FCA Qualification Screening
  - Verify MIS & Overlapping impact (include gen-specific elective upgrades) based on queue order, FCA participation
  - Is overlapping impact screening still necessary?
  - Can GenB conditionally qualify vs. GenA without GenB upgrades?
- Situation
  - GenA is qualified without upgrades
  - GenB with lower Queue Position qualified with upgrades due to GenA
  - GenB clears in the FCA, GenA does not clear
- Observations/Results
  - Queued GenA gets MIS priority
  - GenB that clears in FCA gets overlapping impact "priority" by virtue of FCA bid; **however the GenB deliverability upgrades are no longer needed because GenA did not clear**
  - GenB may need to advance construction of GenA MIS upgrades
  - GenA may no longer qualify in 2nd FCA due to new overlapping impact on GenB (and other FCA winners) *unless GenB is still required to complete its upgrades*
  - GenA needs opportunity to study/remedy deliverability for 2nd FCA (can participate in 2nd FCA Group Deliverability analysis), *unless GenB is still required to complete its upgrades*

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Proposed Process – Example 2D

- Basic Interconnection
  - MIS based on queue order
- Study to Determine Deliverability Upgrades
  - Group Deliverability Required for FCA participation, based on queue order
- FCA Qualification Screening
  - Verify MIS & Overlapping impact (include gen-specific elective upgrades) based on queue order, FCA participation
  - Is overlapping impact screening still necessary?
  - Can GenB conditionally qualify vs. GenA without GenB upgrades?
- Situation
  - GenA is qualified without upgrades
  - GenB with lower Queue Position qualified with upgrades due to GenA
  - GenC with lower Queue Position qualified with significant upgrades due to GenA & GenB
  - GenA, GenB & GenC clear in the FCA
- Observations/Results
  - Queued GenA, GenB, GenC maintain queue MIS priority
  - GenA (&GenB &GenC) that clears in FCA gets overlapping impact “priority” by virtue of primarily queue priority and FCA bid

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Proposed Process – Example 2E

- Basic Interconnection
  - MIS based on queue order
- Study to Determine Deliverability Upgrades
  - Group Deliverability Required for FCA participation, based on queue order
- FCA Qualification Screening
  - Verify MIS & Overlapping impact (include gen-specific elective upgrades) based on queue order, FCA participation
  - Is overlapping impact screening still necessary?
  - Can GenB conditionally qualify vs. GenA without GenB upgrades?
- Situation
  - GenA is qualified without upgrades
  - GenB with lower Queue Position qualified with upgrades due to GenA
  - GenC with lower Queue Position qualified with significant upgrades due to GenA & GenB
  - GenA clears in the FCA, GenB does not clear, GenC clears
- Observations/Results
  - Queued GenA, GenB get MIS priority
  - GenA & GenC that clear in FCA get overlapping impact "priority" by virtue of queue priority and FCA bid; **however the significant GenC deliverability upgrades are no longer needed because GenB did not clear and the GenC requirements are not clearly known without GenB (requires post-FCA restudy)**
  - GenC may need to advance construction of GenB MIS upgrades
  - GenB may no longer qualify in 2nd FCA due to new overlapping impact on GenA, GenC (and other FCA winners)
  - GenB needs opportunity to study/remedy deliverability for 2nd FCA (can participate in 2nd FCA Group Deliverability analysis)

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Proposed Process – Example 2F

- Basic Interconnection
  - MIS based on queue order
- Study to Determine Deliverability Upgrades
  - Group Deliverability Required for FCA participation, based on queue order
- FCA Qualification Screening
  - Verify MIS & Overlapping impact (include gen-specific elective upgrades) based on queue order, FCA participation
  - Is overlapping impact screening still necessary?
  - Can GenB conditionally qualify vs. GenA without GenB upgrades?
- Situation
  - GenA is qualified without upgrades
  - GenB with lower Queue Position qualified with upgrades due to GenA
  - GenC with lower Queue Position qualified with significant upgrades due to GenA & GenB
  - GenA does not clear in the FCA, GenB and GenC clear
- Observations/Results
  - Queued GenA, GenB get MIS priority
  - GenB & GenC that clear in FCA get overlapping impact "priority" by virtue of FCA bid; **the GenB & GenC requirements are not clearly known without GenA (requires post-FCA restudy)**
  - GenB may need to advance construction of GenA MIS upgrades
  - GenC may need to advance construction of GenB MIS upgrades
  - GenA may no longer qualify in 2nd FCA due to new overlapping impact on GenB (and other FCA winners) *unless GenB & GenC are still required to complete their upgrades*
  - GenA needs opportunity to study/remedy deliverability for 2nd FCA (can participate in 2nd FCA Group Deliverability analysis) *unless GenB &GenC are still required to complete their upgrades*

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Proposed Process – Example 2G

- Basic Interconnection
  - MIS based on queue order
- Study to Determine Deliverability Upgrades
  - Group Deliverability Required for FCA participation, based on queue order
- FCA Qualification Screening
  - Verify MIS & Overlapping impact (include gen-specific elective upgrades) based on queue order, FCA participation
  - Is overlapping impact screening still necessary?
  - Can GenB conditionally qualify vs. GenA without GenB upgrades?
- Situation
  - GenA is qualified without upgrades
  - GenB with lower Queue Position qualified with upgrades due to GenA
  - GenC with lower Queue Position qualified with significant upgrades due to GenA & GenB
  - GenA and GenB do not clear in the FCA, GenC clears
- Observations/Results
  - Queued GenA, GenB get MIS priority
  - GenC that clears in FCA gets overlapping impact "priority" by virtue of FCA bid; **however the significant GenC deliverability upgrades are no longer needed because GenA and GenB did not clear; GenC requirements are not clearly known without GenA and GenB (requires post-FCA restudy)**
  - GenC may need to advance construction of GenA & GenB MIS upgrades
  - GenA and GenB may no longer qualify in 2nd FCA due to new overlapping impact on GenC (and other FCA winners) *unless GenB & GenC are still required to complete their upgrades*
  - GenA & GenB need opportunity to study/remedy deliverability for 2nd FCA (can participate in 2nd FCA Group Deliverability analysis) *unless GenB &GenC are still required to complete their upgrades*

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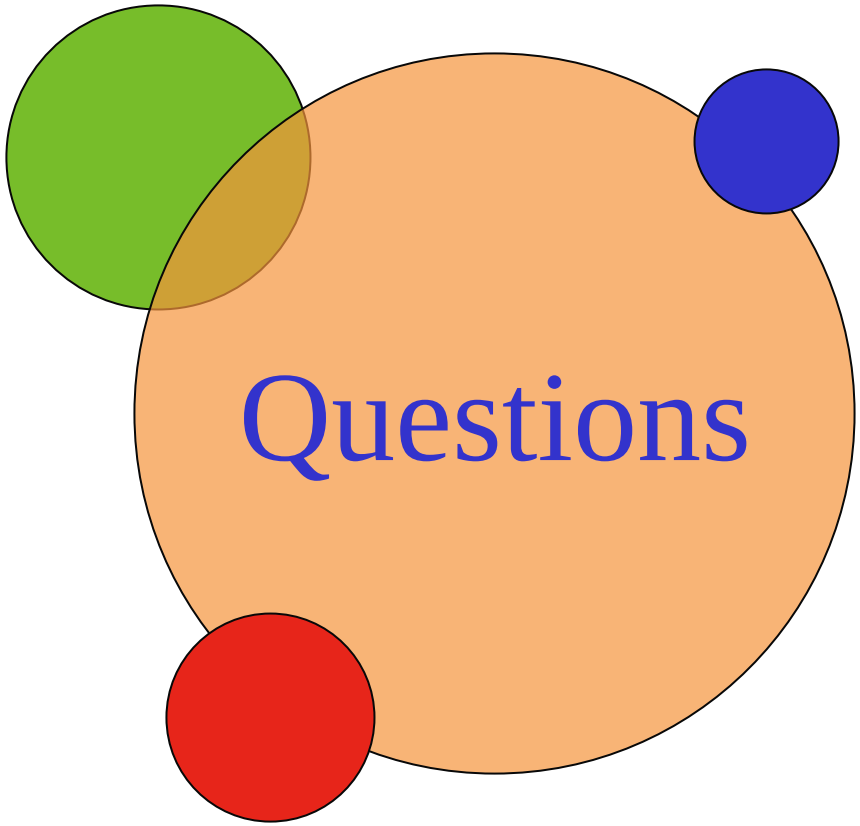

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Conditionally Qualified Resources: Impact on Auction Mechanics (Round 2 – Complexity Issues)

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Director, Resource Adequacy and Chief Economist

Roger Bacon
Manager, Annual FCM Auctions

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Major Components of Straw Proposal (Revised)

- **Conditional Status Option**
  - New option for Generating Capacity Supply Resources
  - A Lower Queue priority resource at the same location could "conditionally qualify" for the FCA along with the primary resource
  - When a higher Queue priority resource withdraws from the FCA, the lower Queue resource may take its place and be allowed to clear, depending on the minimization of consumer cost determination within the Clearing Algorithm
- **Include "Overlapping Impact" deliverability standard in the OATT Large/Small Generator Interconnection Procedures**
  - Limit the analysis to the resources being evaluated for each FCA
  - Studies would look at the FCA resources collectively and individually
    - These studies provide the necessary support for "conditional qualifications"
- **Accommodate deliverability of "Long Lead Time" capacity resources**
  - Rigid milestones
  - Financial Assurance
  - Commitment to system improvements

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Conditional Status Option: Benefits of Straw Proposal (Revised)

- Increases competition within the auction
  - More Resources can qualify for the FCA where overlapping impacts exist
- Queue order may still matter, but not in all possible scenarios
  - Generating Resources are prioritized for the auction based on Queue position
    - Change: More than one resource at the same location may participate
  - A "non-conditional", or higher queued, resource remaining in the auction through completion may be awarded the capacity obligation
  - If the higher queue resource does not withdraw until the auction closure, it clears "in-merit" and will be awarded the clearing price (see minimum Capacity Award)
  - Conditionally Qualified Resource will not be considered by Cost Optimization and will not clear

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Conditional Status Option: Benefits of Straw Proposal (Revised cont.)

- A higher Queue order resource that withdraws based on price may be replaced by the conditionally qualified resource's next in Queue order if it has not withdrawn earlier based on price
- Similar logic to current market mechanisms, but with special auction and clearing issues
  - Competition between primary and conditional resources offers in the final round of auction or in close price range could lead to complexities when choosing between offers
  - Cost minimization selection during execution of Clearing Algorithm

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Conditionally Qualified Resources (Revised)

- Assume two resources sought to qualify but only one at a time could meet the overlapping impacts test
- Higher queued resources would be qualified, lower queued resource would be "conditionally qualified"
- Both would post Financial Assurance
- Both would participate in the FCA from the start price
- While the conditionally qualified resource would know its conditional status through its Qualification letter, during the auction it wouldn't know if the higher queued resource had withdrawn
- At the close of the auction, if both remain, the higher queued resource may or may not clear
- Conditionally qualified capacity entering the FCA may increase or decrease the total MW of capacity offered

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Conditionally Qualified Resources (Revised cont.)

- Descending clock auction expects quantities offered to decrease as price falls
- The descending clock auction works under most scenarios if the primary resource is larger than the conditionally qualified resource, but there are complex cases that must be modeled
  - Scenario 1: conditional unit qualifies for 100 MW, primary unit qualifies for 125 MW
  - When primary unit leaves the FCA, quantity falls by net of 25 MW
  - Scenario 2: conditional unit qualifies 300 MW, primary unit qualifies for 200 MW
  - When primary unit drops out, quantity increases by net of 100 MW

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Conditionally Qualified Resources (Revised cont.)

- Special Market Rules will be required to meet complex scenarios
- Auction must descend far enough to reveal increased quantity at lower price
  - Below minimum MW needed to meet the Installed Capacity Requirement
- Market Rules will control not Queue position if a primary unit offers fewer MW than the conditional resource and withdraws from the auction during the last round of the auction
- Examples follow

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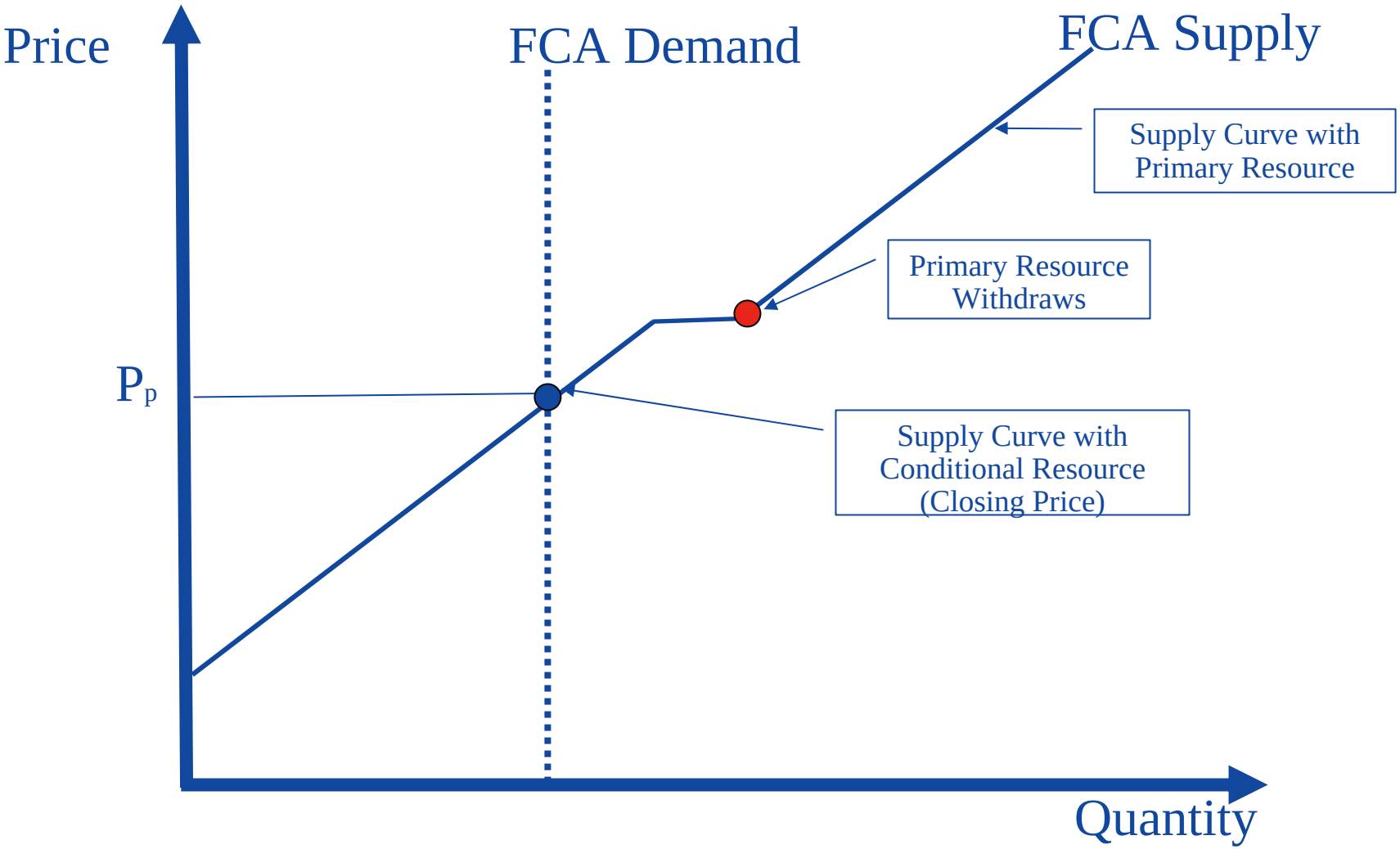
Base Case Scenario (1)
Conditional MW ≤ Primary MW: Illustration of Principle



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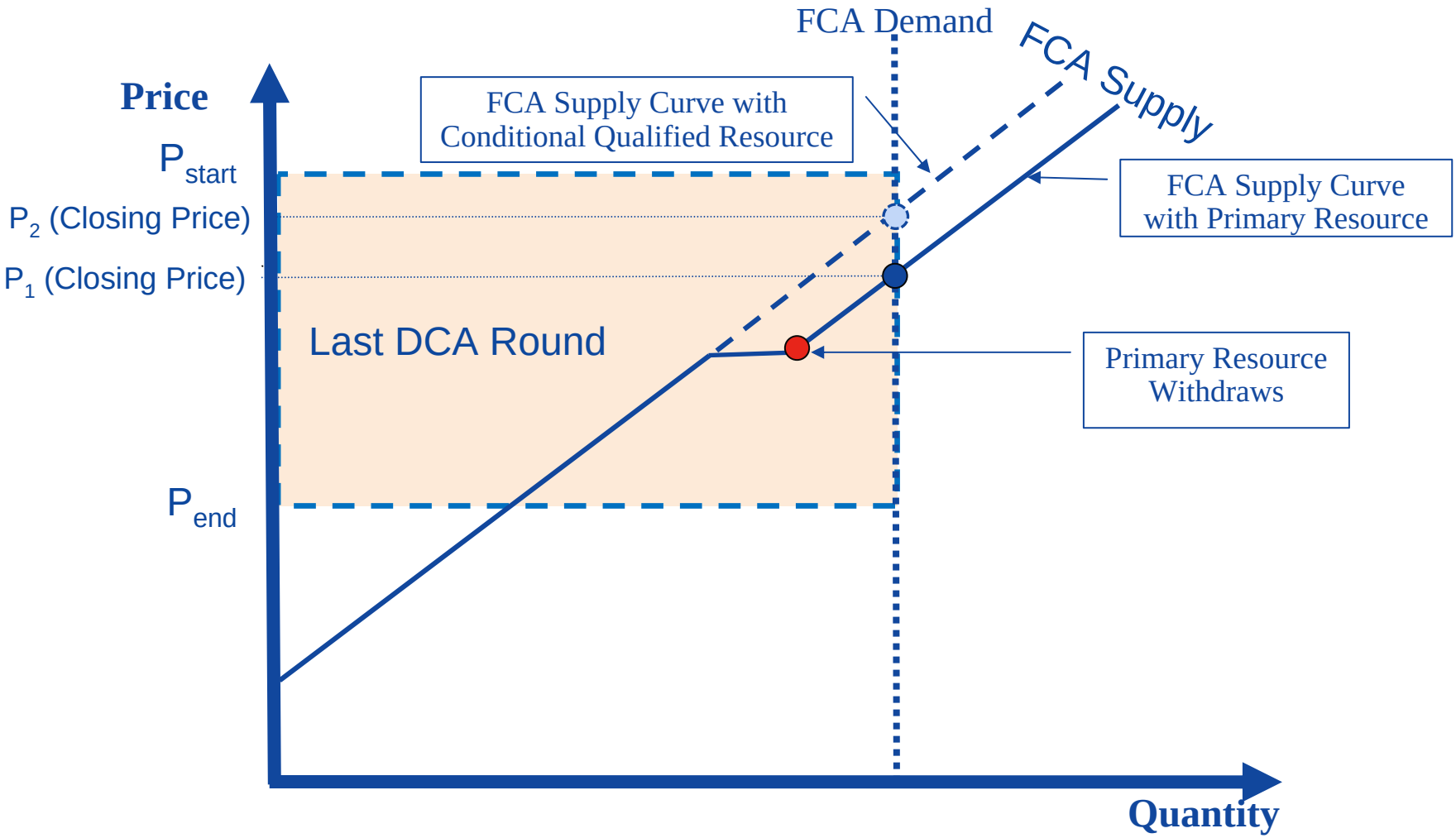
Complexity Scenario (1)
Conditional MW ≤ Primary MW: Illustration of Principle



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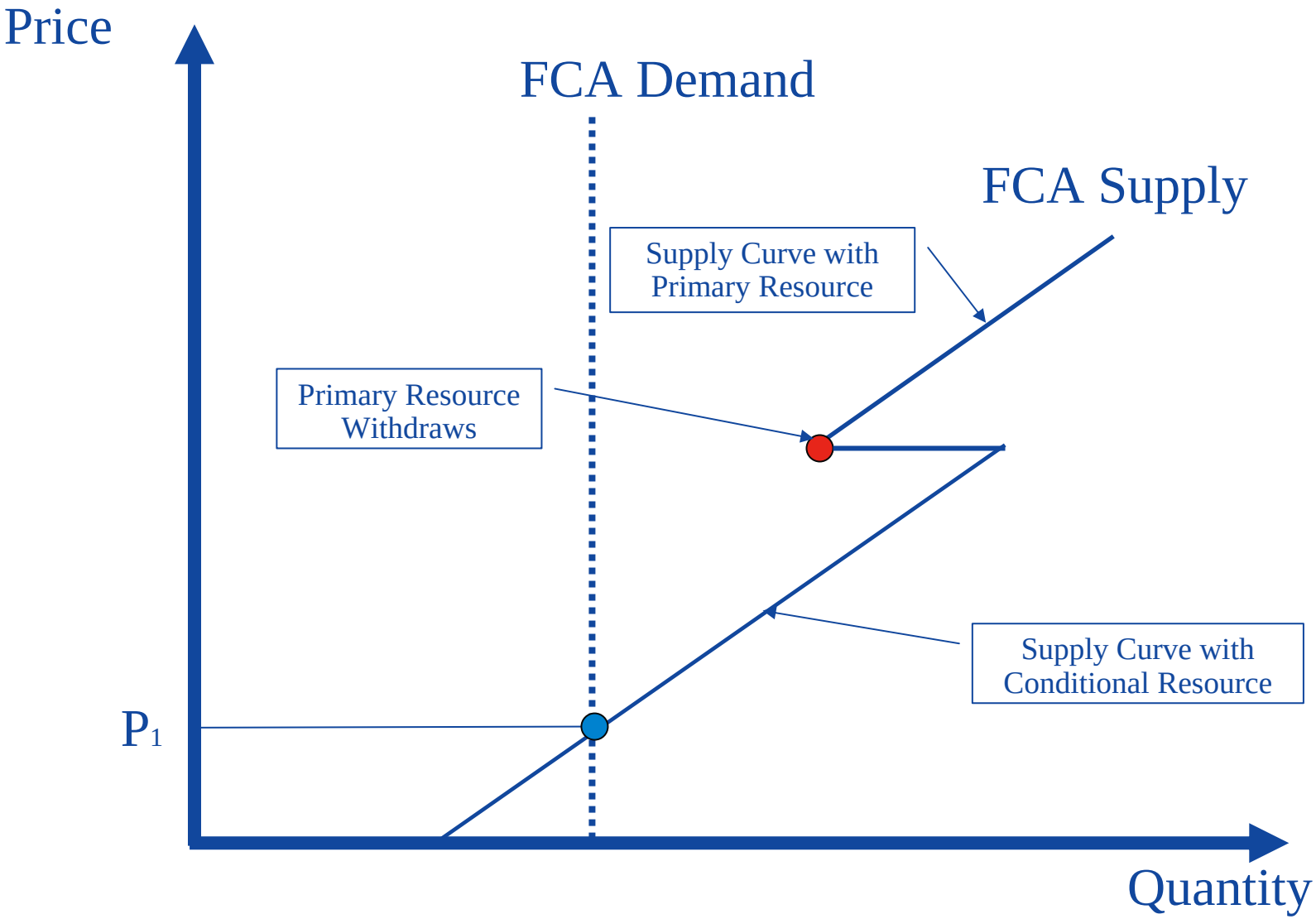
Conditional MW > Primary MW: Illustration of Principal (Scenario 2 – Base Case)



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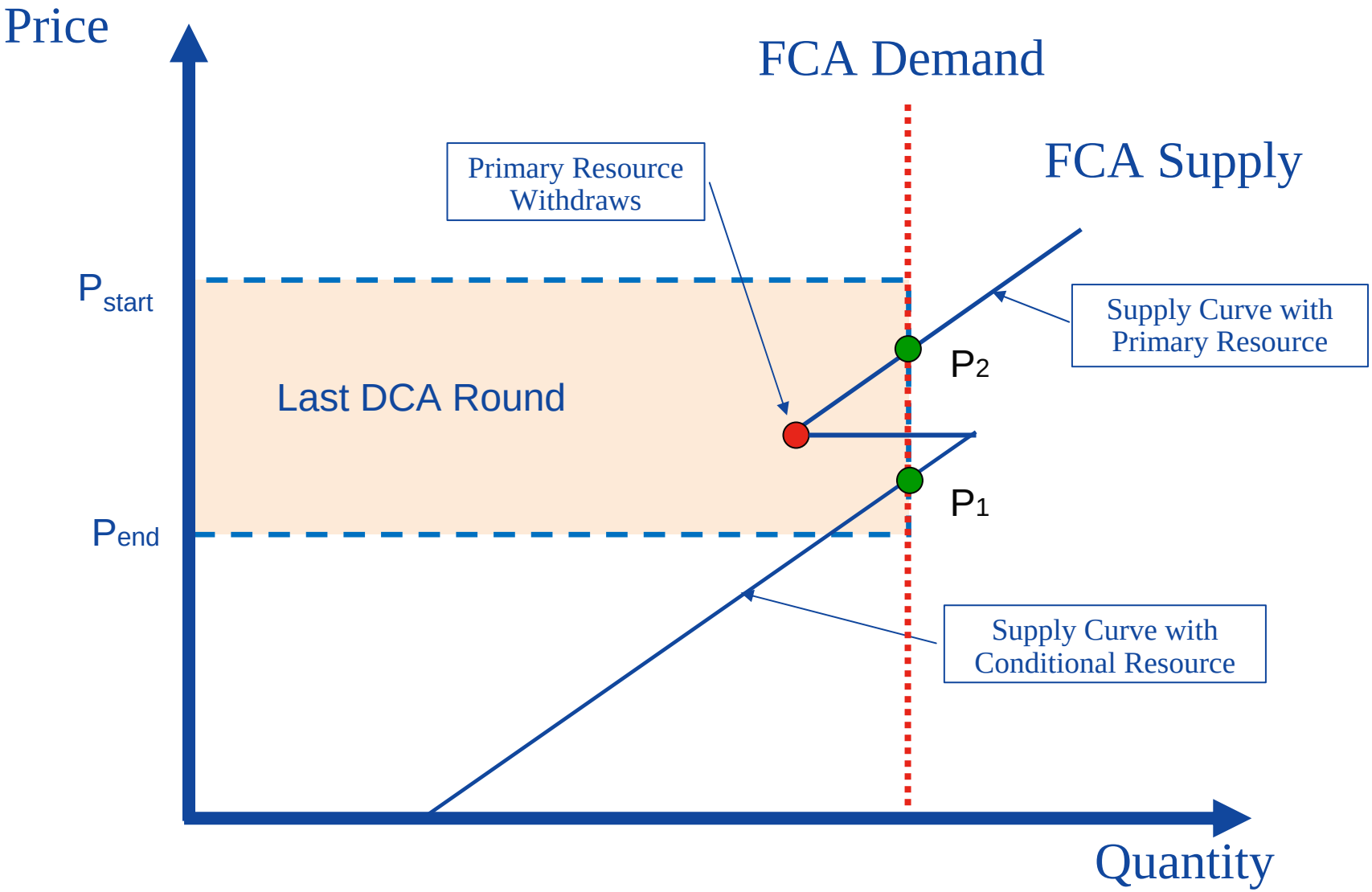
Conditional MW > Primary MW: Illustration of Principal (Scenario 2 – Complex Case A)



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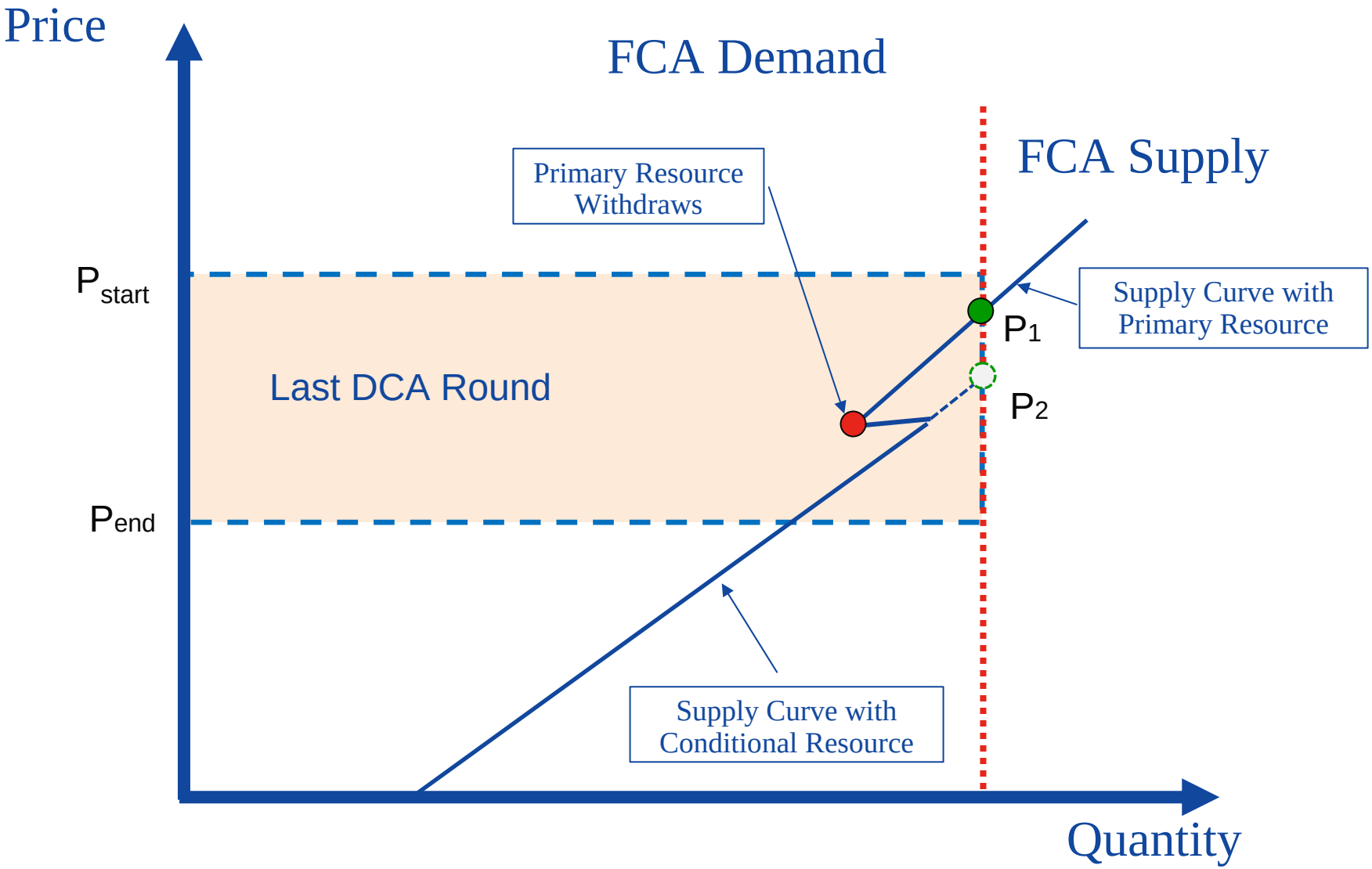
Conditional MW > Primary MW: Illustration of Principal (Scenario 2 – Complex Case B)



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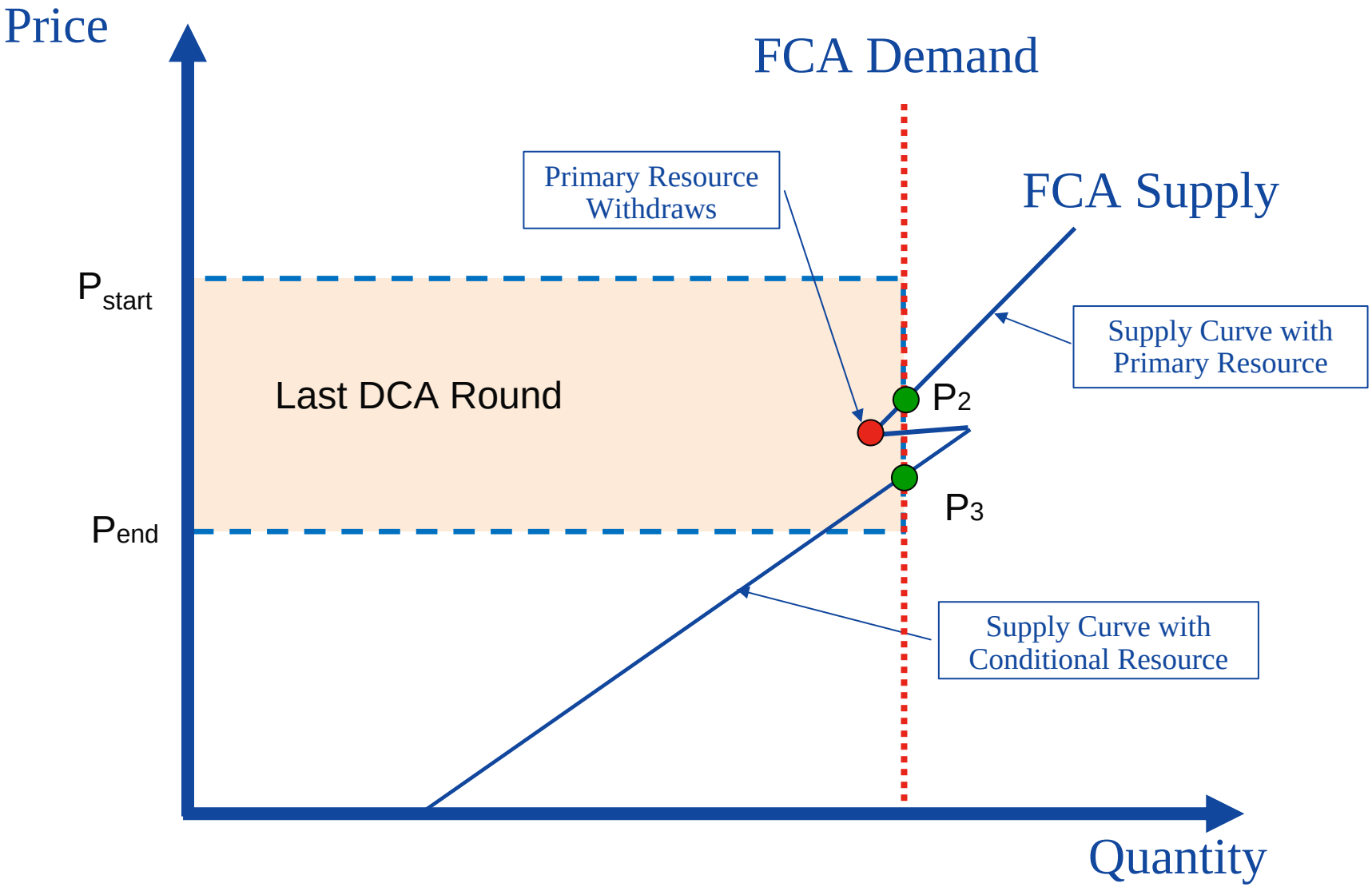
Conditional MW > Primary MW: Illustration of Principal (Scenario 2 – Complex Case C)



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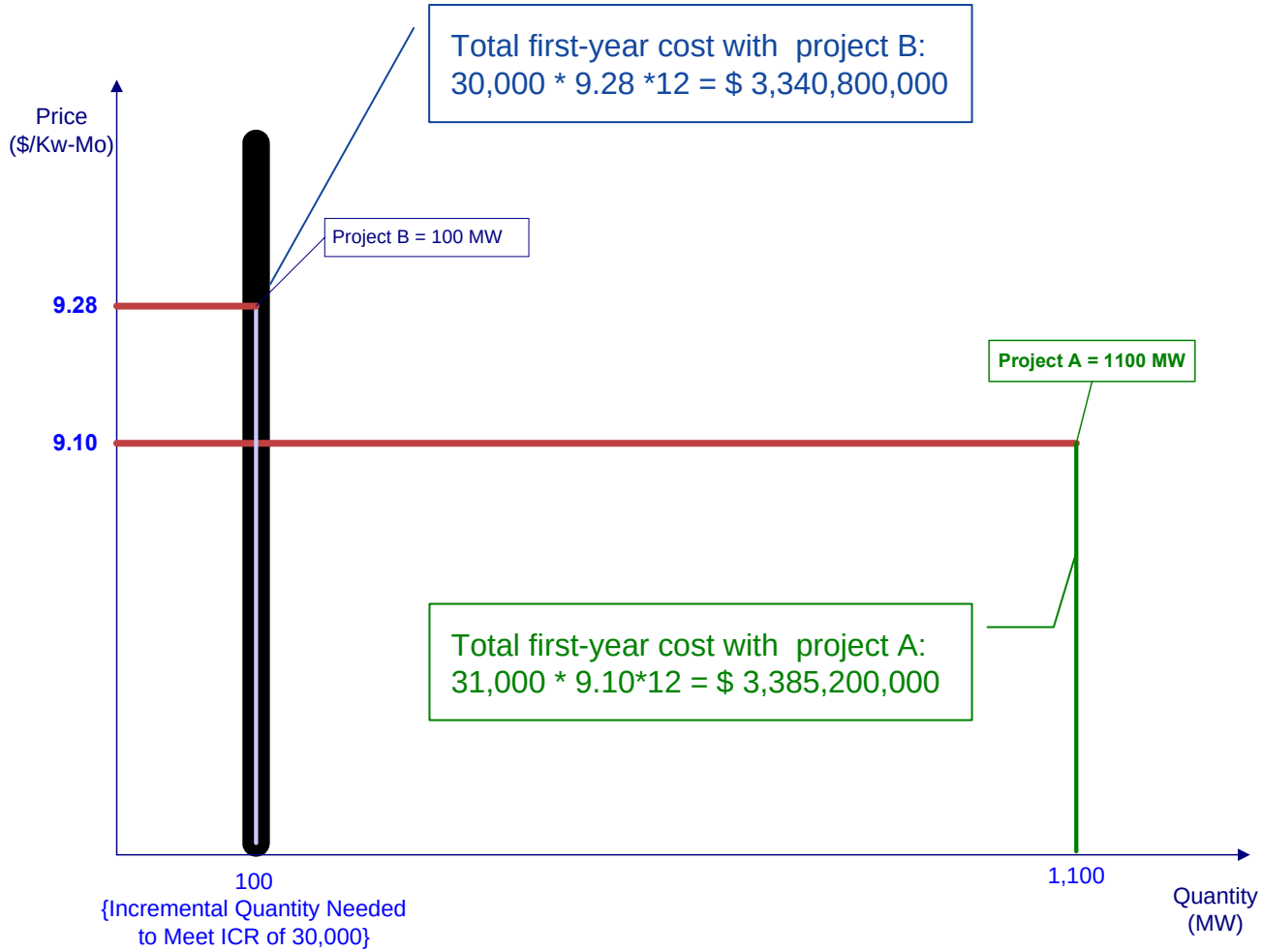
Closing the Auction: Minimizing Total Cost



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Example of Clearing Algorithm Issues with Conditional Qualified Capacity Resources

- **Resource A** – **80 MW** - high in Queue (rationable)
- **Resource B** – **100 MW** – conditionally qualified with A (not rationable)
- **Resource C** – **200 MW** – unrelated new resource in same capacity zone (not rationable)

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Example of Clearing Algorithm Issues with Conditional Qualified Capacity Resources (cont.)

FCA – single zone/single round Starting Price = $12.00

Offer Price Range	Resource A	Res B (Conditional)	Resource C	Max Excess Capacity above ICR	
$12.00 - $10.01	80 MW	100 MW	200 MW	150 MW	(Max (Res A, Res B) B is accounted for)
$10.00 - $ 9.51	80 MW	100 MW	0 MW	- 50 MW	(Res A is withdrawn; Res B is accounted for)
$ 9.50	0 MW	100 MW	0 MW	- 50 MW	DCA Closing Price = $10.00

Resource C (unrelated new resource) withdrew at $10.00

Resource A withdrew at $ 9.50

Resource B is offered until end-of-round

DCA Closing Price: $10.00

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Example of Clearing Algorithm Issues with Conditional Qualified Capacity Resources (cont.)

- In order to meet ICR non-rationable criterion, Resource C MUST clear
  - It will set the Clearing Price ($10.00)
- Any of the two Resources (A or B) offered at a lower price will be sufficient to meet ICR
- If Conditional Resource B is cleared (since it is offered at the end-of-round price), it will lead to
  a) Situation where Resource A with a higher position in the queue and offered below the Clearing Price (!!!) does not clear
  b) Increased consumer cost, since Resource B is non-rationable and all 100 MW must clear
     - vs. Resource A which may be rationed to 50 MW

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Conditional Qualified Resource Straw Proposal: Summary

- Possible complex scenarios must be addressed in both the auction software and clearing algorithm
- Several Market Rule changes may be required to accurately reflect the implementation of this proposal
- A review of the Market Power implications of this proposal on the FCM is underway by Peter Cramton
- Stakeholder process may produce additional issues that will need to be evaluated

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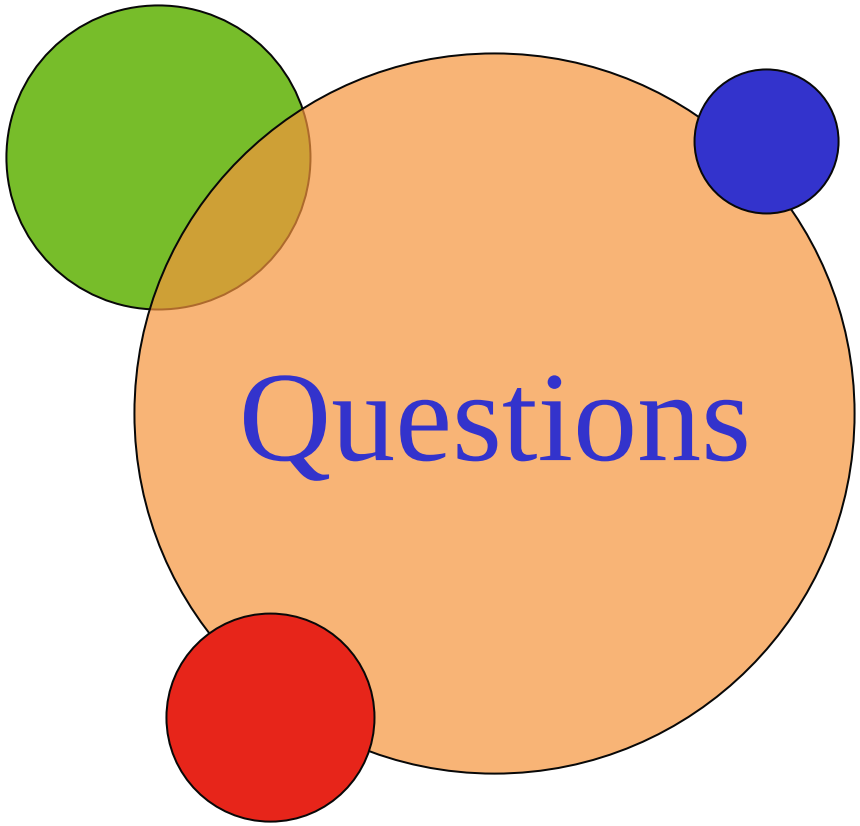

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