The Forward Capacity Market ("FCM") in New England

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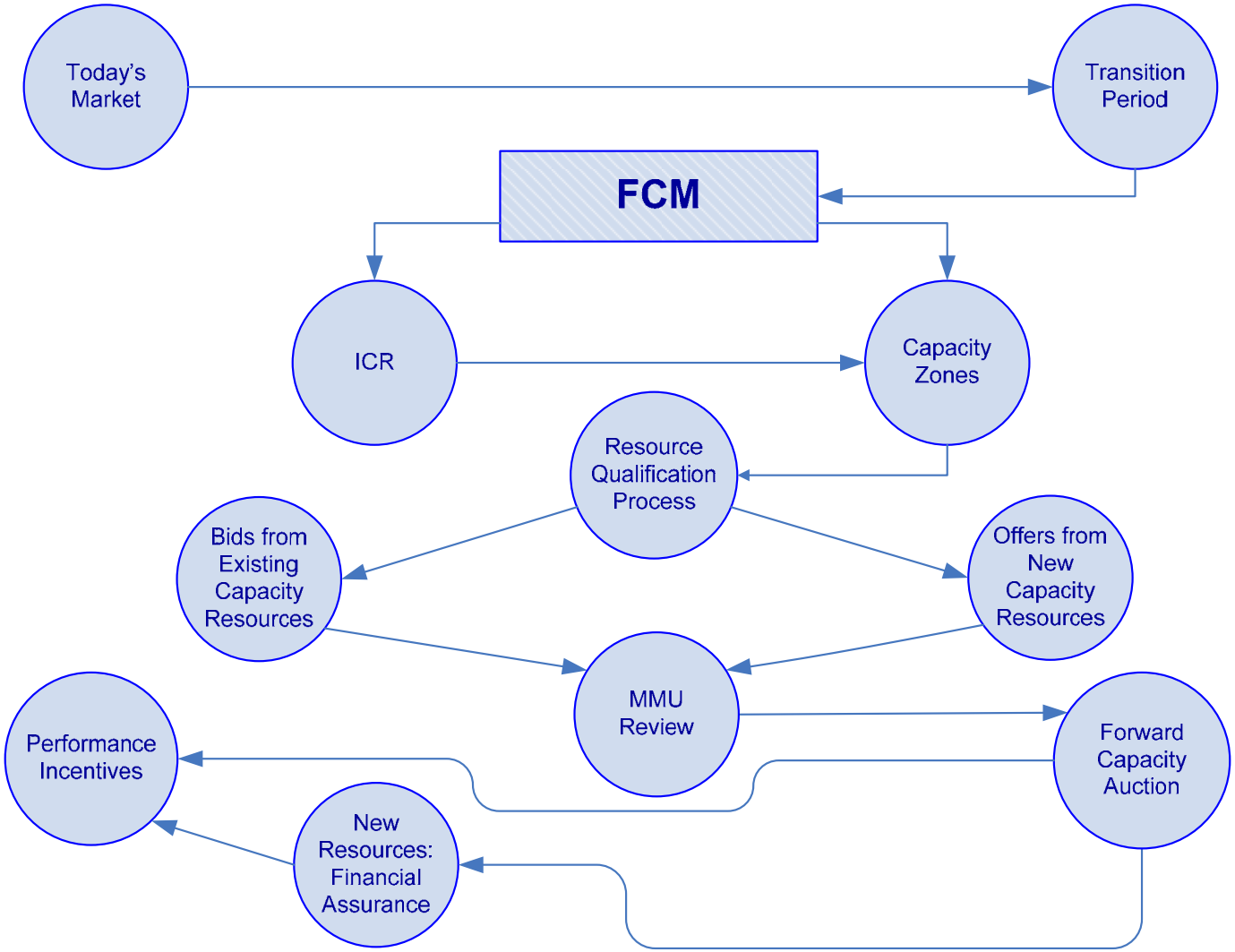
Objectives of this Presentation

1. Present an OVERVIEW of the FCM
   - Definitions
   - Transition Payments
   - FCM Components
   - Timeline
2. Summarize its Major Components
   - Purpose
   - Qualification Process
   - Capacity Zones
   - Forward Capacity Auction
   - Performance Incentives
   - Financial Assurance
   - Reconfiguration Auctions

New England Capacity Market: Overview



Definitions

Important Terms Used in the FCM

FCA	Forward Capacity Auction
Capacity	Amount of capacity (Qualified MW) that a resource is allowed to offer into the FCM
Offer	Amount of capacity that a resource owner offers to sell into FCM
Bids	Capacity that wants to leave or not participate in the FCM
CONE	Cost of New Entry – Fixed Costs
ICR	Installed Capacity Requirement
PER	Peak Energy Rent adjustment to the FCA payment – avoids double payments
Commitment Period	Whole year obligation to provide future capacity
Reconfiguration Auction	Opportunity to adjust offers to buy and sell capacity after the primary FCA

Transition Payments

Transition Costs: Bridge to FCM

1. Effective December 2006 through May 2010
2. Fixed capacity payments to all resources
   - Existing
   - New
   - Imports
3. Ensures Reliability
4. Payments adjusted for historical availability

Date	Payment ($/KW-month)	Estimated Total Payment ($Billion)
12/01/2006 – 05/31/2007	$3.05	0.6
06/01/2007 – 05/31/2008	$3.05	1.2
06/01/2008 – 05/31/2009	$3.75	1.4
06/01/2009 – 05/31/2010	$4.10	1.6

FCM Design

Purpose of FCM

1. Provide Compensation for the Fixed Capacity Cost of a Generation or Demand Resource
2. Attract New Resources to Constrained Regions
3. Define the Performance of Supply Resources
4. Implement a Pay for Performance Approach for Capacity
5. Provide an Energy Price Hedge for Load

FCM – Design Parameters

1. Primary Auction for Capacity About Three Years Before the Delivery Year (Descending Clock Auction)
2. Allow New Proposed Capacity Projects to Compete in the Market and Set Price
   - Market is not limited to existing resources
3. Include New Categories of Resources
   - Demand Resources and Conservation
   - Intermittent (Wind, Hydro, Solar, and Other) Generation
4. Market Only Buys Capacity to meet New England's ICR – No Obligations Assigned to Remaining Resources
5. Implement a Shortage Hour Availability

Major Components of the FCM

1. Qualification
   - for both Existing and New capacity resource offers
2. Forward Capacity Auction (FCA)
   - to purchase the capacity resources
3. Performance Incentives
   - pay for performance during shortage events
   - PER deduction
4. Financial Assurance
   - Deterrent to frivolous New capacity offers and commitment period defaults
5. Reconfiguration Auctions
   - to buy and sell (exchange) capacity obligations before and during the commitment period

FCM Components: Qualification Process

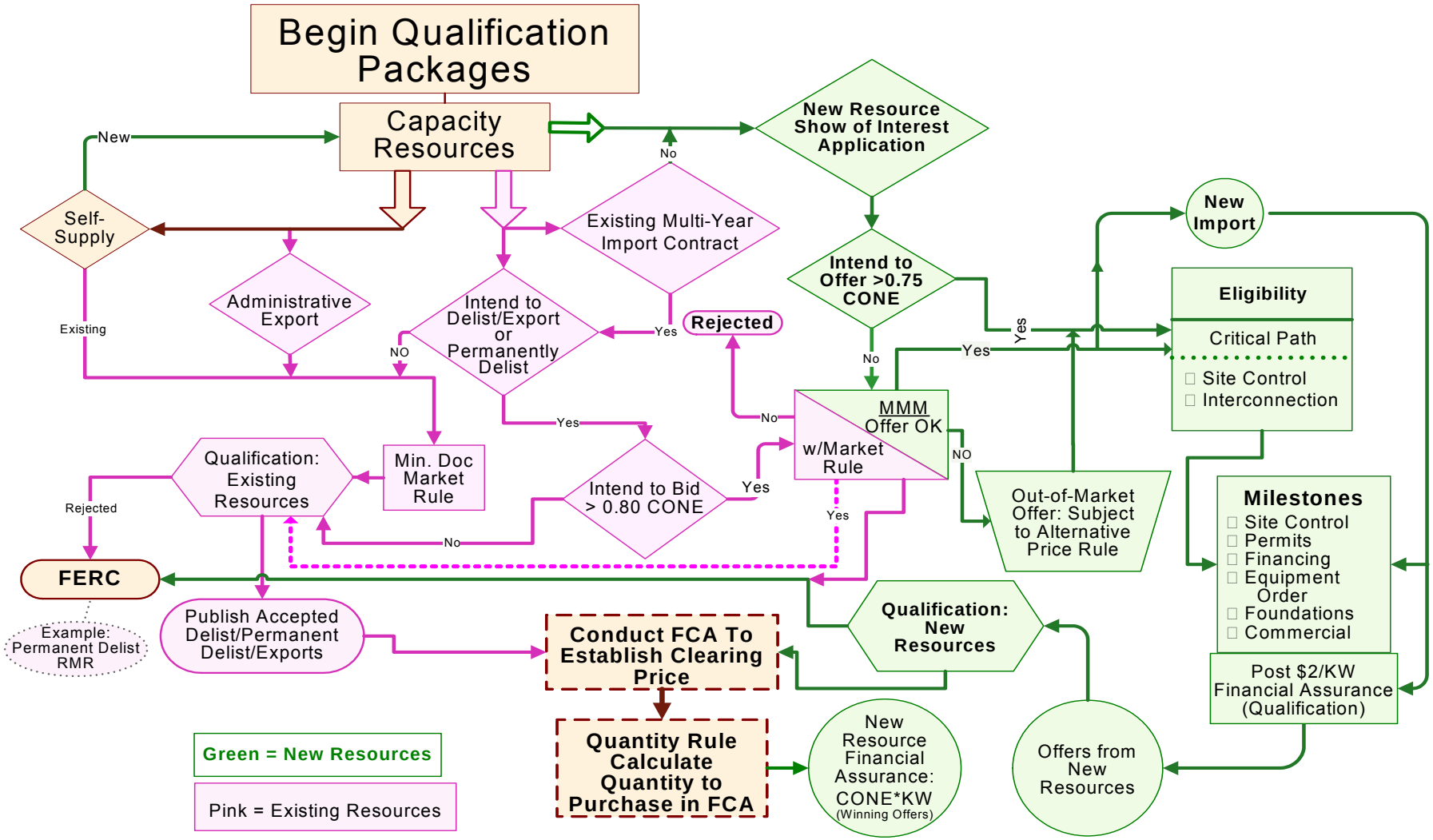
FCM Components – Qualification

1. **Qualification** of the following resources is required:
   - Existing Capacity (Including De-list, Permanent and Partial)
   - Self-Supplied Resources
   - Exports
   - Imports
   - New Resources (Including Intermittent and Demand Response)
2. **Qualification** Criteria is different for each Resource Type

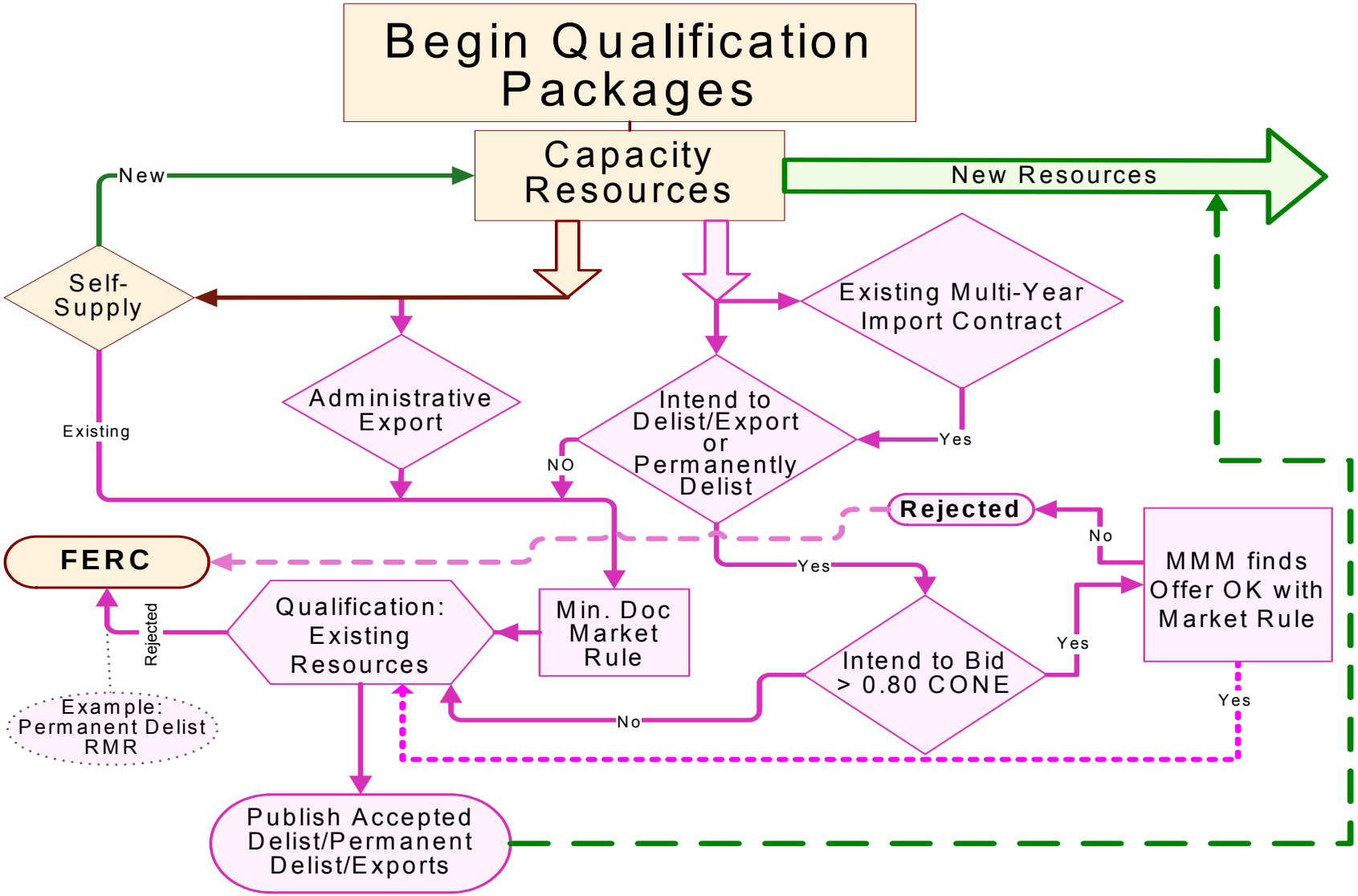
   - **New capacity resource:** must certify by the qualification deadline, that it will be able to produce a specific MW value for a future Commitment Period

   - **Existing capacity resource**: will be assigned a specific MW value for a future Commitment Period

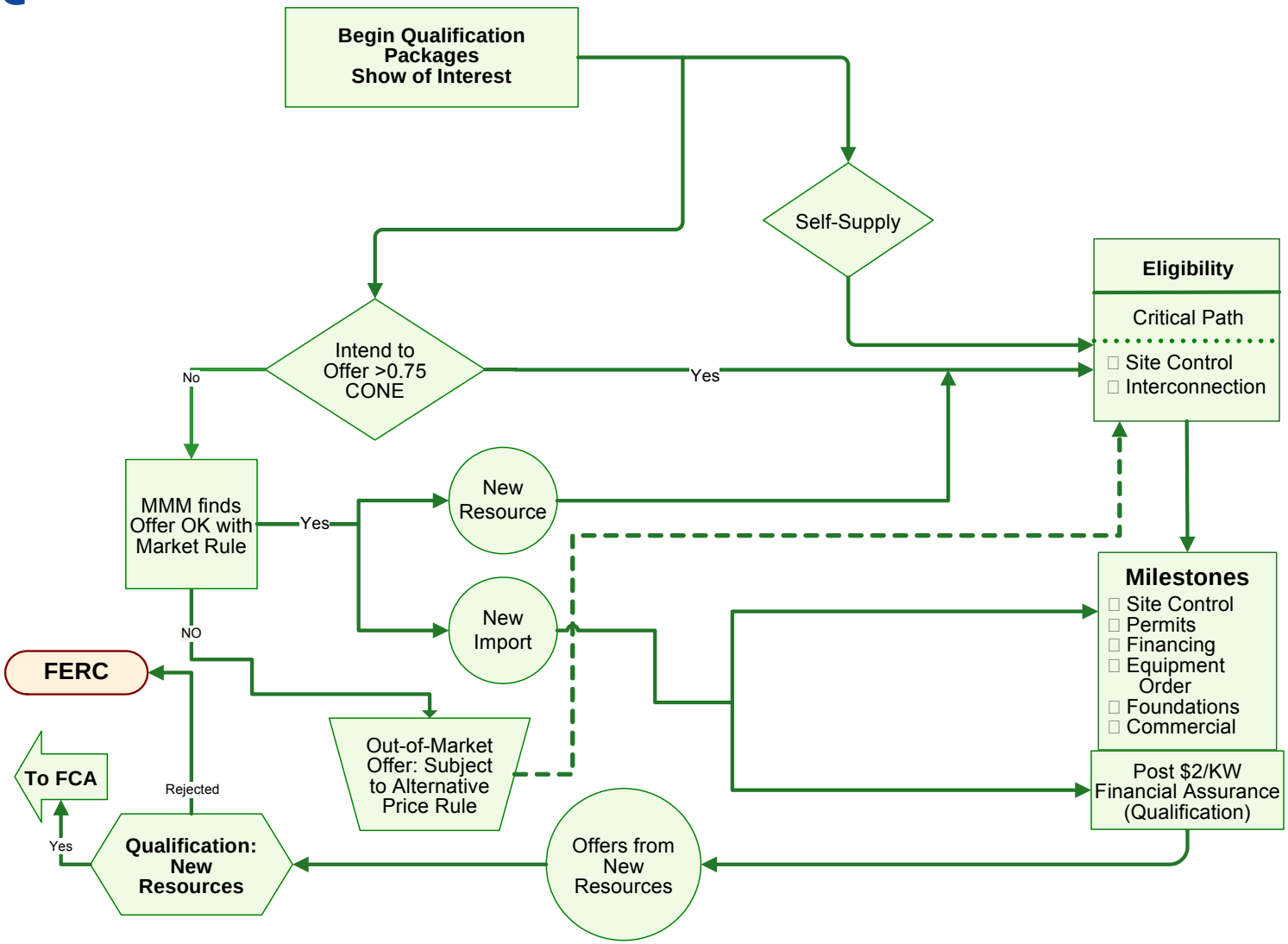
Qualification Process



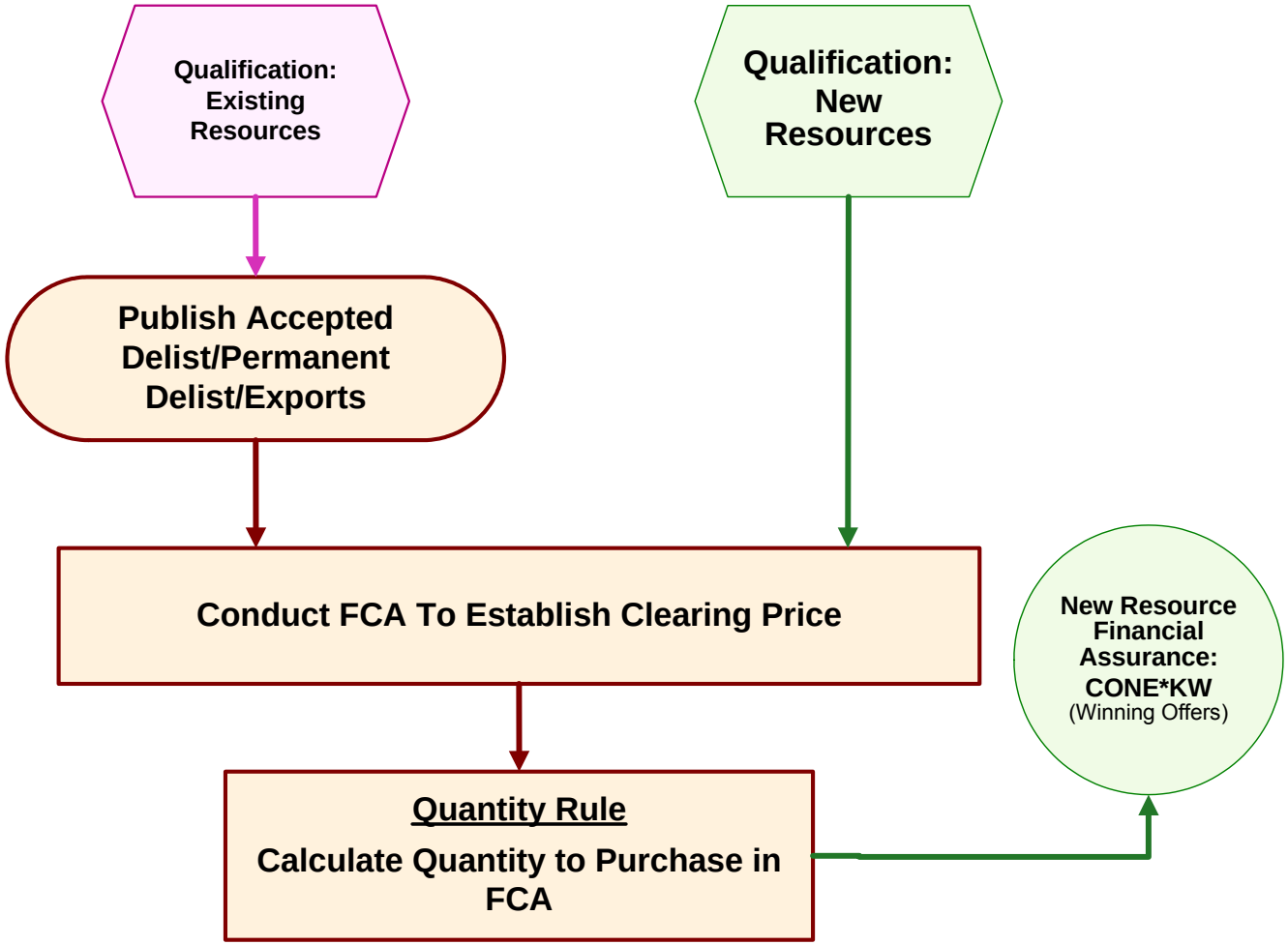
Qualification Process: Existing Resources



Qualification Process: New Resources



Qualified Resources: Eligible for the FCA



Role of Market Monitor in the FCA

1. Review Offers and Bids for potential Market Power abuse
   - Examine for attempts to lower or raise the price outside target price thresholds
2. Existing Capacity is assumed to be in the FCA unless it takes action to leave (De-list)
   - Addresses potential Market Power abuse
     - Existing Capacity dwarfs New
     - Long-run costs are small relative to cost of new entry
     - Existing Capacity treated as a Zero-Bid in the FCA
     - Receives auction clearing price for only 1 year
     - Already invested

Role of Market Monitor in the FCA - Continued

3. Evaluate Bids from Existing resources that De-List in the FCA
4. Evaluate Offers from New Capacity Resources that intend to Offer below 0.75 x CONE
4. Decide if sufficient quantity is present to conduct a competitive FCA or invoke reserve pricing (Inadequate Supply or Insufficient Competition)
5. Report on the conduct and results of the FCA to the FERC

Existing Capacity: De-List Bids

De-Listed Capacity Resources opt out of FCA for entire Commitment Period (or Periods for Permanent De-List)

De-List Bid Category	Category Definition	Market Monitor Approval	Time of Submission
Static	Bids above 0.8 CONE	Required	At Qualification
Dynamic	Bids below 0.8 CONE	Not Required	During Auction Cycle
Permanent	Bids above 1.25 CONE	Required	At Qualification
Export	Bids above 0.8 CONE	Required	At Qualification

All De-List bids submitted during Qualification are binding for that FCA

FCM Components:
Forward Capacity Auction

Prior to a FCA Descending Clock Auction

1. Capacity Zones designated before the FCA
   - Based on transfer limits expected to bind in the auction
     - Import constrained zones
       - Local Sourcing Requirements exceed Zonal Capacity
     - Export constrained zones
       - Maximum capacity transfer limit < available surplus capacity
2. FCA begins with a single system wide price
     - All capacity initially treated as a single Capacity Zone
     - Price separation only occurs if and when a transfer limit binds
3. A Capacity Zone for that Commitment Period exists only if price separation occurs
   - Capacity Zones remain the same for the Reconfiguration Auctions

FCA: Offers and Bids

1. Primary FCA: 3 years ahead of delivery
   - e.g. – Auction held in early 2008 for delivery in mid-2010
2. Existing Resources
   - Price takers
   - De-List bids
     - Price below which it wishes to remove existing capacity from the FCA
   - Annual Commitment
3. New Capacity
   - Offers
     - The quantity it wishes to offer into the market
   - Selects commitment period of 1 – 5 years
     - Whole-year commitment
     - Longer commitment reduces investment risk
     - Auction price indexed for inflation after first year

Note: These Definitions are also used in Reconfigurations

FCA: Offers and Bids (con't)

4. Imports
   - Annual Commitment
   - Existing Import Capacity
     - Capacity that has a multi year contract
   - New Import Capacity
     - Capacity offered into the FCA each year
5. Exports
   - Annual Commitment
   - Multi – Year Exports
     - Administrative Delist
   - Treated as de-list bids for purposes of 'Quantity Rule'

Note: These Definitions are also used in Reconfigurations

Market Power Safeguards in the FCA

1. Existing Capacity assumed in the FCA unless it De-lists
   - Potential market power
     - Existing capacity dwarfs new
     - Long-run costs small relative to CONE
       - Already invested
   - FCA rules minimize market power potential
     - Existing capacity treated as zero-bid in FCA
     - Commitment period limited to one year

2. MMU reviews Offers and Bids for potential market power abuse
   - Evaluates De-List bids for attempted withholding
   - Target price thresholds (1.5 x CONE, 1.25 x CONE, 1.20 X CONE, 0.8 x CONE)

Auction Mechanics: Overview

1. Held 3 – 4 years in advance of commitment period
2. Local sourcing requirements for each Capacity Zone
3. Bidders offer new capacity they are willing to supply at each price
   - Starting price = 2 x Cost of New Entry ("CONE")
     - Initial starting price = $15/kw-month
     - Bidders offer quantities they are willing to supply at that price

Descending Clock Auction Mechanics

1. Clock auction is done in discrete rounds
2. For each round, Auctioneer announces:
   - Excess supply at the end of prior round
   - Start of round price (higher price)
   - End of round price (lower price)
3. Each participant submits the MW capacity it is willing to supply at prices within range
4. Auctioneer determines excess supply at end of round price
5. If no excess supply, clearing price is determined

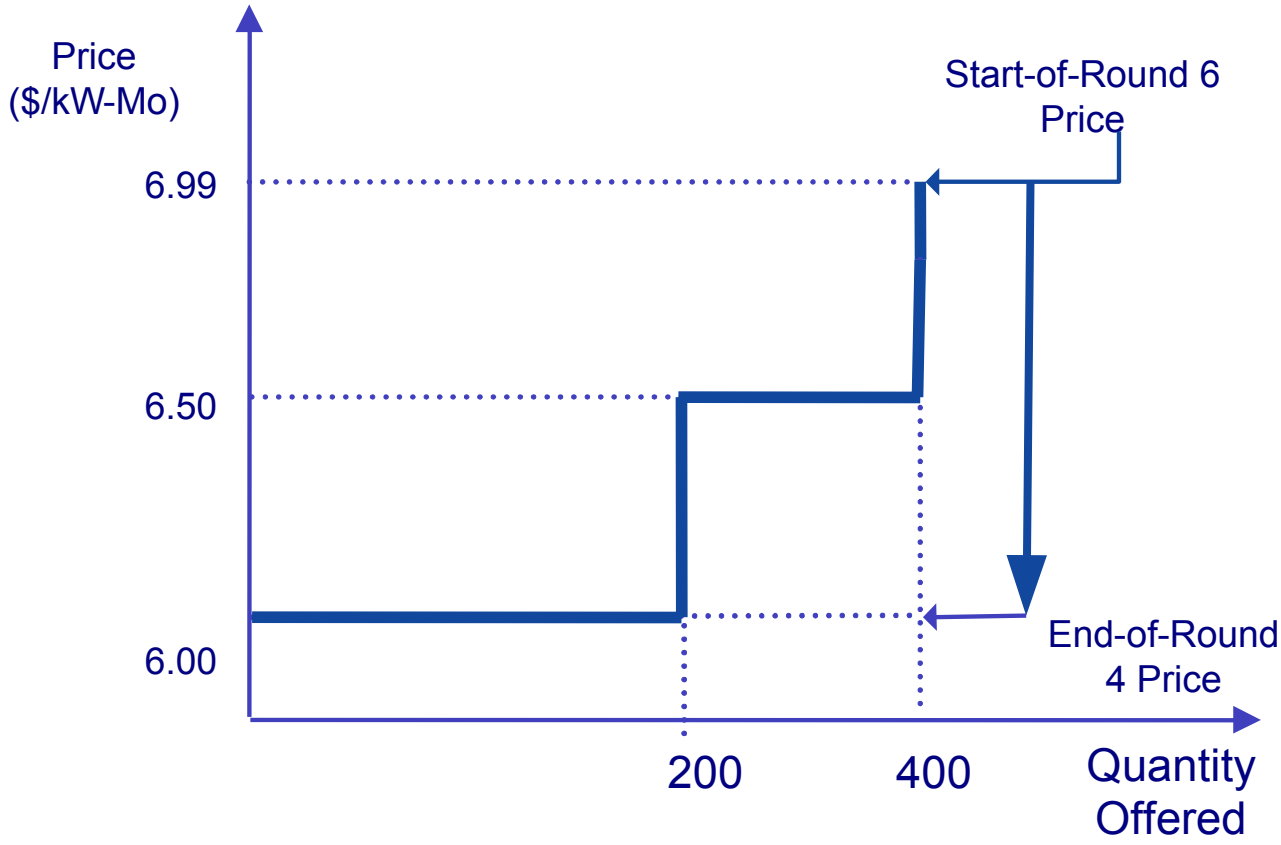
Descending Clock Auction: Example

Assumptions:	
ICR	30,000 MW
Existing Capability	23,000 MW
New Resources needed to meet ICR	7,000 MW
Participating New Capacity	10,000 MW

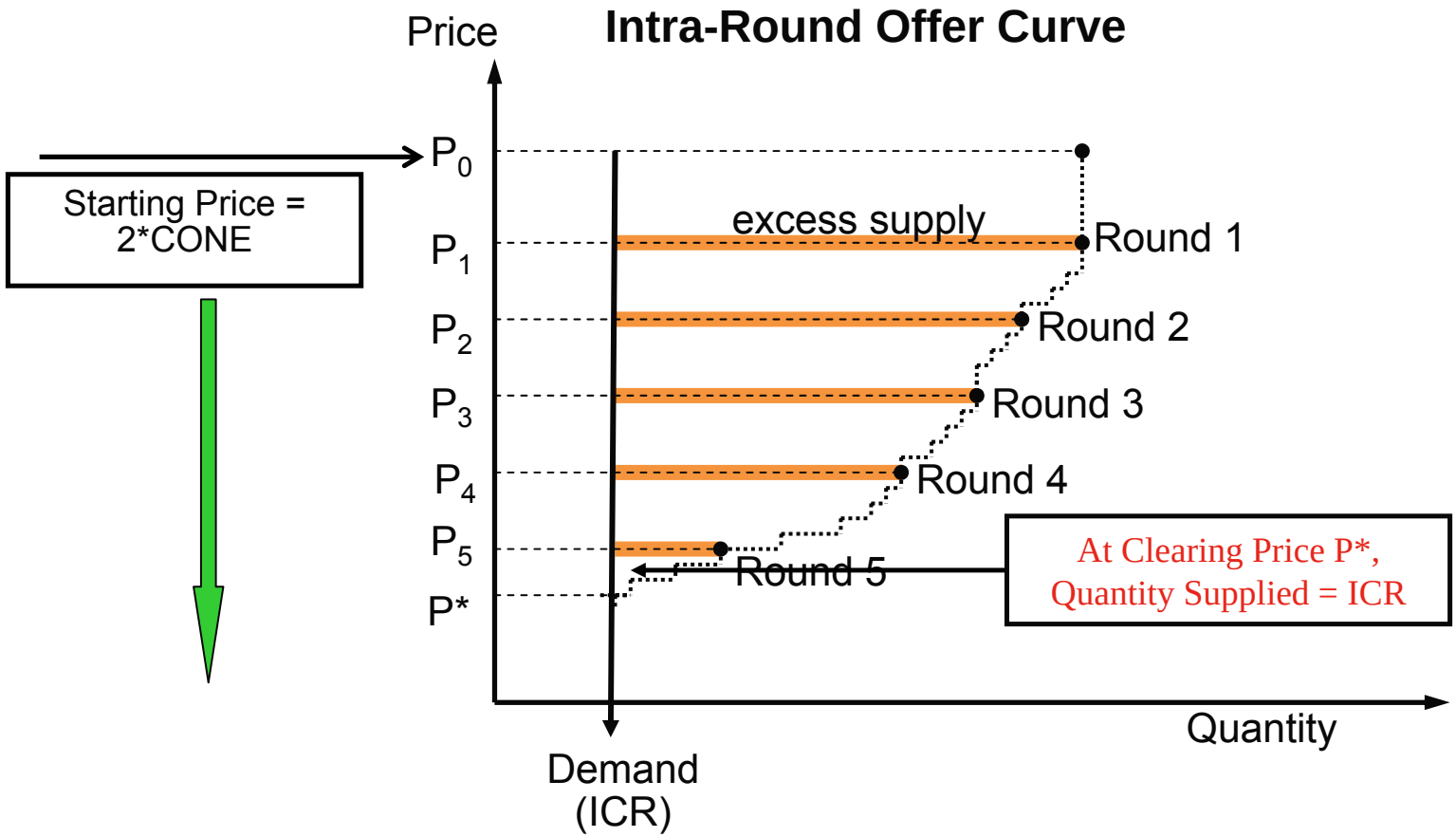
Round	Start of Round Price ($/kW-MO)	End of Round Price ($/kW-MO)	End-of-Round Resource Offers (MW)	Excess Capacity (MW)
1	$15.00	$ 9.50	33,000	3,000
2	$ 9.49	$ 9.00	32,500	2,500
3	$ 8.99	$ 8.00	32,000	2,000
4	$ 7.99	$ 7.50	31,000	1,000
5	$ 7.49	$ 7.00	30,750	750
6	$ 6.99	$ 6.00	29,800	-200
FINAL		$ 6.50	30,000	0

Descending Clock Auction Mechanics

Supply Offer, Round 6



Descending Clock Auction Mechanics (Continued)



Quantity Rule

1. Capacity needed to replace the capacity associated with an accepted Permanent De-list bid shall not be purchased in the FCA if the Capacity Clearing Price equals or exceeds 1.5 times CONE.
2. Capacity needed to replace the capacity associated with an accepted De-list Bid above 1.2 times CONE shall not be purchased in the FCA. Instead, the capacity needed to replace the capacity associated with such De-list Bids shall be advanced into subsequent reconfiguration auctions.

Quantity Rule (cont)

4. For prices between 1.25 times CONE and 1.5 times CONE, the quantity of capacity requirement associated with Permanent De-lists replaced in the FCA increases pro-rata. The amount of capacity needed to replace capacity of an accepted Permanent De-List Bid that is not purchased in the FCA shall be purchased in subsequent reconfiguration auctions.

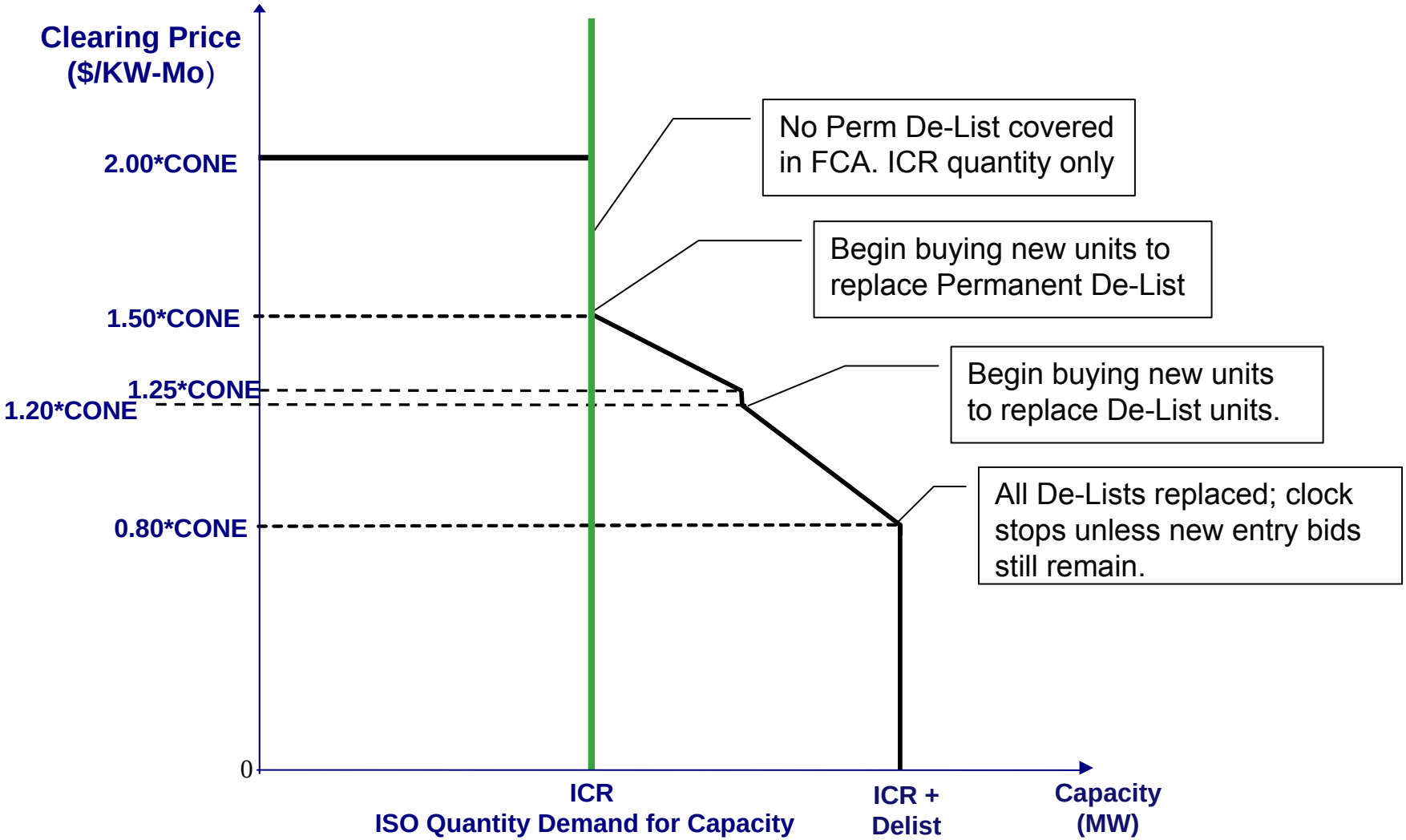
5. Permanent De-list Bids below 1.25 times CONE shall be eligible to set the price in the FCA. If accepted, the capacity requirements shall be replaced in full in the FCA.

Quantity Rule (cont)

6. For prices from 0.8 times CONE to 1.2 times CONE, the quantity of replacement capacity for accepted De-list Bids purchased in the FCA increase pro-rata. De-list bids below 0.8 times CONE may leave during the auction subject to a reliability review.

7. Any De-list Bids that were not purchased in the FCA shall be purchased in a reconfiguration auction.

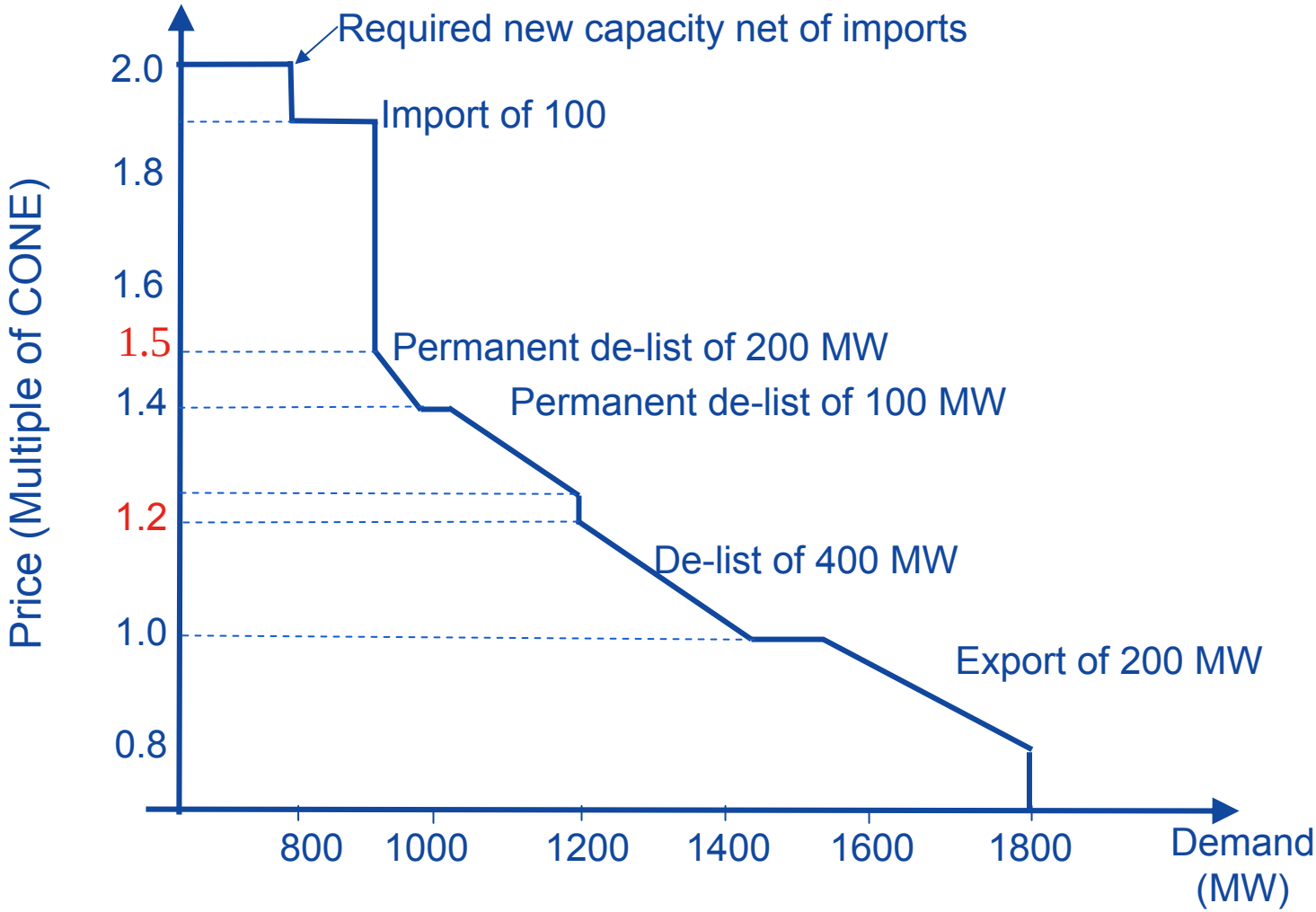
Quantity Rule – Auction Mechanics



Example – Delist Bids and Demand in FCA

Type of Bid	Price (CONE X)	Quantity (MW)	Demand Impact
Import	1.90	100	Step of 100 MW at 1.90
Permanent De-list	1.80	200	Linear increase from 0 MW at 1.50 to 200 MW at 1.25
Permanent De-list	1.40	100	Step of (.1/.25) x 100 = 40 MW at 1.40 Linear increase from 0 MW at 1.40 to 60 MW at 1.25
Static De-list	1.30	400	Linear increase from 0 MW at 1.20 to 400 MW at 0.80
Export	1.00	200	Step of (.2/.4) x 200 = 100 MW at 1.00 Linear increase from 0 MW at 1.00 to 100 MW at 0.80

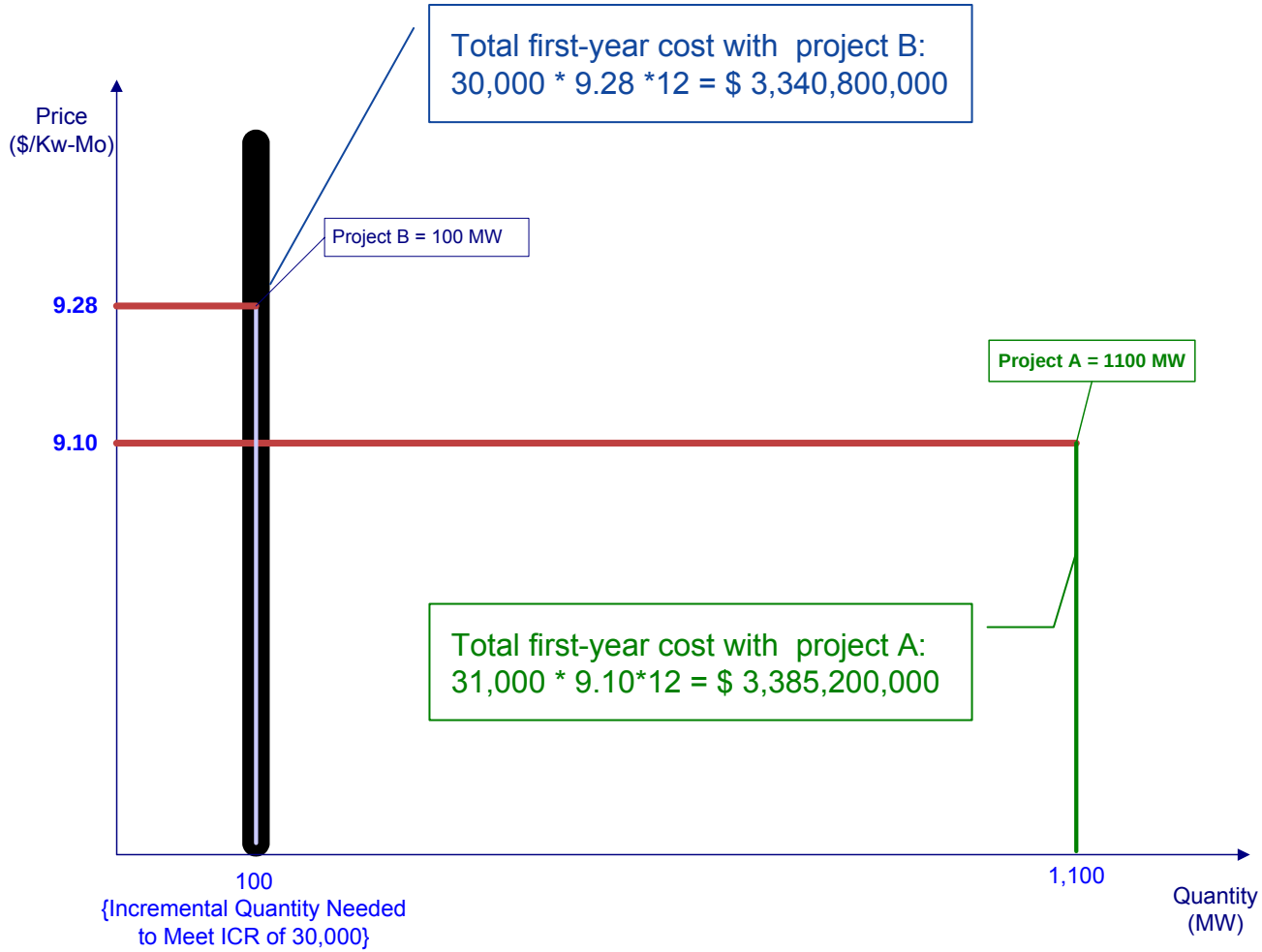
Demand Curve for New Capacity



Clearing In The FCA – Treatment Of Offers and Bids

1. Dynamic De-list bids are entered during the clock auction when prices drop below .8*CONE
2. Dynamic De-list bids are subject to Reliability Review by the ISO.
3. Dynamic De-list bids will be accepted on a pro-rata basis if more are submitted at a price than are needed
4. New Resources Accepted in Qualification must enter the full amount of the Qualified Capacity in the first round of the FCA
5. The Quantity of an Offer can be reduced (By the Supplier) in subsequent rounds as the price drops

Determining the Clearing Price w/ Excess Supply



Clearing In The FCA -- Zones

1. Import-Constrained Capacity Zone
   - FCA for that Capacity Zone concludes on the first of the following conditions:
     - Total system capacity = ICR **OR**
     - Remaining Capacity offered into zone = Local Sourcing Requirement (LSR)
   - Clearing Price for Zone is the price at which either of these conditions is met
   - The auction for that Zone is then complete

Note: Clearing Price May Be Higher in Import Zone

Clearing In The FCA – Zones (Continued)

2. Rest-of-Pool Zone
   - FCA for the ROP Capacity Zone concludes when
     - Total system capacity = ICR
       - No more than maximum capacity transfer from export-constrained zone
   - Clearing Price is set by this condition

3. Export-Constrained Capacity Zone
   - FCA for these Capacity Zones concludes on the last of the following conditions:
     - Total system capacity = ICR
       - Export Constraint is not violated **OR**
     - Capacity offered into zone ≤ Maximum Capacity Limit
   - Clearing Price for Zone is determined when last condition is met

Note: Clearing Price May Be Be Lower in Export Zone

FCA Mechanics – Auction Failure Protection: Inadequate Supply

1. Capacity Zone
   - Insufficient supply to meet local sourcing requirement
     - New capacity is paid 2xCONE
     - Existing capacity is paid 1.1xCONE
     - FCA is conducted for other zones with adequate supply
     - De-Listed bids remain as capacity resources
2. System Wide
   - Insufficient supply to meet ICR
     - Auction is conducted for export constrained zones
     - In all other zones
       - New capacity is paid 2*CONE
       - Existing capacity is paid 1.1*CONE
     - De-Listed bids remain as capacity resources

Note: Not Enough New Capacity Shows Up

FCA Mechanics – Auction Failure Protection: Insufficient Competition

1. System-Wide or individual Capacity Zone:
   - Existing Capacity < ICR or Local Sourcing Requirement; and
   - At 2xCONE insufficient capacity offered :
     - Less than 300 MW is bid or
     - New capacity required < New capacity bid < 2 x new capacity required;

   OR

   - At 2xCONE insufficient competition in the market for new capacity:
     - New capacity or New Import Capacity bid is pivotal
       - Some of the new capacity bid is required to meet the ICR
2. Auction is conducted
   - New capacity is paid the clearing price
   - Existing capacity is paid min{clearing price, 1.1xCONE}

Note: Some New Capacity Shows Up – But Not Enough

Carry-Forward Rule: Import Constrained Zone

1. Capacity purchases might exceed zonal requirements
   - ISO must accept entire offer in unless specified otherwise by the supplier
   - Market clearing is based on minimizing total FCA costs
2. Extra MW are "Carried Forward" to the next FCA
   - Treated as "Out of Market Bids" subject to the Alternative Price Rule
   - If zone requires no New Capacity, clearing price must be ≤ clearing price in FCA in which "Carried Forward" MWs were purchased
   - Carried Forward rules apply until carried forward MWs are eliminated

Note: New Resources Must Be Accepted in Whole

Alternative Price Rule: New Capacity

1. System-wide or Zonal
2. Addresses Buyer's Market Power
   - Market monitor reviews New Capacity bids below 0.75 x CONE
   - If bid is too low, capacity is considered 'Out of Market'
3. Out of Market Capacity includes Carry-Forward Capacity
4. If Out-of-Market capacity > new capacity needed:
   - Clearing price = min {CONE, or price at which the last new capacity left the auction}

Note: Intended to Curb Loads Ability To Exercise Market Power

Starting Price and Determination of CONE: First Three Successful Auctions

1. Start-of-Auction Price = 2 x CONE
2. First 3 Successful Auctions: Collar of $4.50/Kw-month to $10.50/Kw-month on clearing price
3. CONE Determination
   - Until 1st Successful Auction
     - CONE = $7.50/kW-month
   - After 1st Successful Auction & before 2nd Successful Auction
     - CONE = $3.75/kW-month + ½ of Capacity Clearing Price from the 1st Successful Auction
   - After 2nd Successful Auction and before 3rd Successful Auction
     - CONE = $1.88/kW-month + ¾ of average Capacity Clearing Price from the 1st and 2nd Successful Auctions

Note: Controls The Outcome Of First Three Auctions

Starting Price and Determination of CONE: Subsequent Successful Auctions

Start-of-Auction Price = 2 x CONE

1. If the auction is successful and new capacity sets the clearing price, then:
   - CONE FCA_t = (0.70 x CONE FCA_{t-1} + 0.30 x Capacity Clearing Price in $year_t$)
2. Otherwise:
   - CONE FCA_t = CONE FCA_{t-1}

FCM Components:
Performance and Financial Assurance

FCM Components – Performance Incentives

1. Performance: Resources unavailable in shortage events get reduced Capacity Payments
   - System Wide Reserve Constraint Penalty Factors “RCPFs” trigger a shortage event
2. PER Deduction: LMP > strike price ➔ capacity payments are reduced by PER calculation
   - PER adjustments affect all units – on line or off
   - Reduces market power in energy spot market – removes any incentive to withhold

Performance Requirements

1. Real Time Availability Performance Measures
   - Resources must be available when operating reserves are short [The Event]
2. Resources unavailable in shortage events get reduced capacity payments
   - Penalty = 5% of annual FCA payment pr event
   - Pro-rated in MW
   - Capped at 10% per day
   - Monthly penalty cannot exceed 2.5 times FCA payment in that month
   - Annual penalties cannot exceed total FCA payment less PER adjustments

Peak Energy Rent Adjustment

1. Prevents
   - double payment
   - exercise of market power in the energy market
2. Energy price is deducted from the capacity payment when Energy Prices exceed cost of a peaking unit (assumed 22,000 heat rate)
   - At current gas prices, this is approximately $155/MWH

FCM Components – Financial Assurance

1. Load Serving Entity Obligation
   - Monthly Capacity Payment = Actual Credit exposure under the existing Financial Assurance Policy ("FAP")
2. Supplier Obligation
   - Existing Capacity: Existing FAP requirements
   - Resource retiring at end of Commitment Period:
     - Additional Financial Assurance = 2.5 times the FCA Monthly Payment
   - New Capacity
     - Qualification Phase: Initial Deposit of $2/kw x Qualified MW Capacity ("Application Fee")
       - If Selected, Application Fee is applied to 1st Payment below;
       - otherwise it is returned.
     - 1st Payment (Within 5 Business Days) – Monthly CONE x MW awarded
     - 2nd Payment (At Least 15 Days Prior to next FCA) –Monthly CONE x MW awarded
     - 3rd Payment (At Least 15 Days Prior to following FCA) –Monthly CONE x MW awarded.
   - Total Financial Assurance Payments = Three monthly payments

FCM Components: Reconfiguration Auctions

FCM Components – Reconfiguration Auction Phase

1. Capacity Products:
   - Obligation trading among physical resources
   - Additional capacity to cover increased ICR
   - Released capacity to match decreased ICR
   - Deferred capacity requirements from existing capacity resources
     - Permanent De-List
     - De-List Bids
2. Distinct product for each zone defined in the FCA
3. Clearing price:
   - Reconfigured Supply = Reconfigured Demand

Reconfiguration Auction Phase (con't)

1. Annual Reconfiguration Auctions:
   - Full year commitment
   - After the primary FCA
   - Held approximately 2 years, 1 year and just before the FCA Commitment period
2. Monthly and Seasonal Reconfiguration Auctions:
   - Adjust annual commitments during the commitment period
   - Begins the first month of the first commitment period
   - Permits Participants to adjust (buy/sell) positions

FCM Timeline for 1st FCA

Horizon	Action
11/01/2006-12/31/2006	Show of Interest Application
02/15/2007	FCM rules filed with Federal Energy Regulatory Commission
01/01/2007 – 10/31/2007	Qualification Review
04/30/2007	Deadline: Existing Capacity Qualification Packages and De-list requests
05/01/2007	ISO Posts Export and De-List Bid Information
06/15/2007	Deadline: Qualification for New Capacity and Imports
10/01/2007	Notify New Resources of Qualification and Financial Assurance Requirements as well as disposition of de-list requests
10/12/2007	Deadline: Post Financial Assurance for New Resources
11/01/2007	De-List Bids, Capacity Zones, LSRs & ICR filed with FERC
02/01/2008	FCA #1 – Delivery for June 2010 through May 2011