

NERA

Economic Consulting

RAM Model

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Marsh & McLennan Companies

How Markets Work



Final Presentation Builds on Material Explained in Previous Meetings

- NERA made four interim presentations
- Each presentation was partial in concentrating on certain elements of the RAM
- Each presentation went into the details of the recommendations

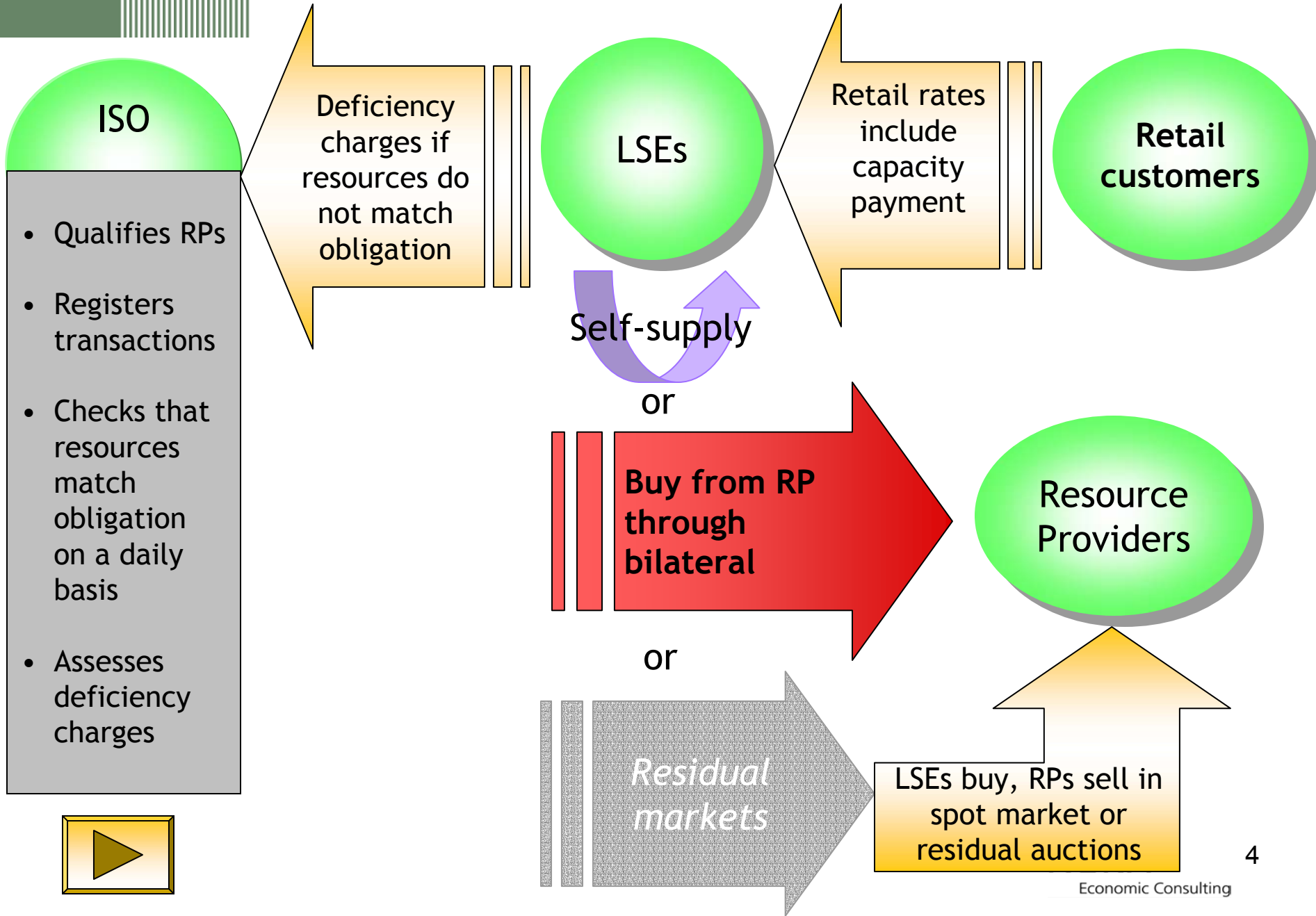
Today we integrate all the elements of the RAM, emphasizing how all elements work together to fulfill objectives, and using the present system as a point of comparison



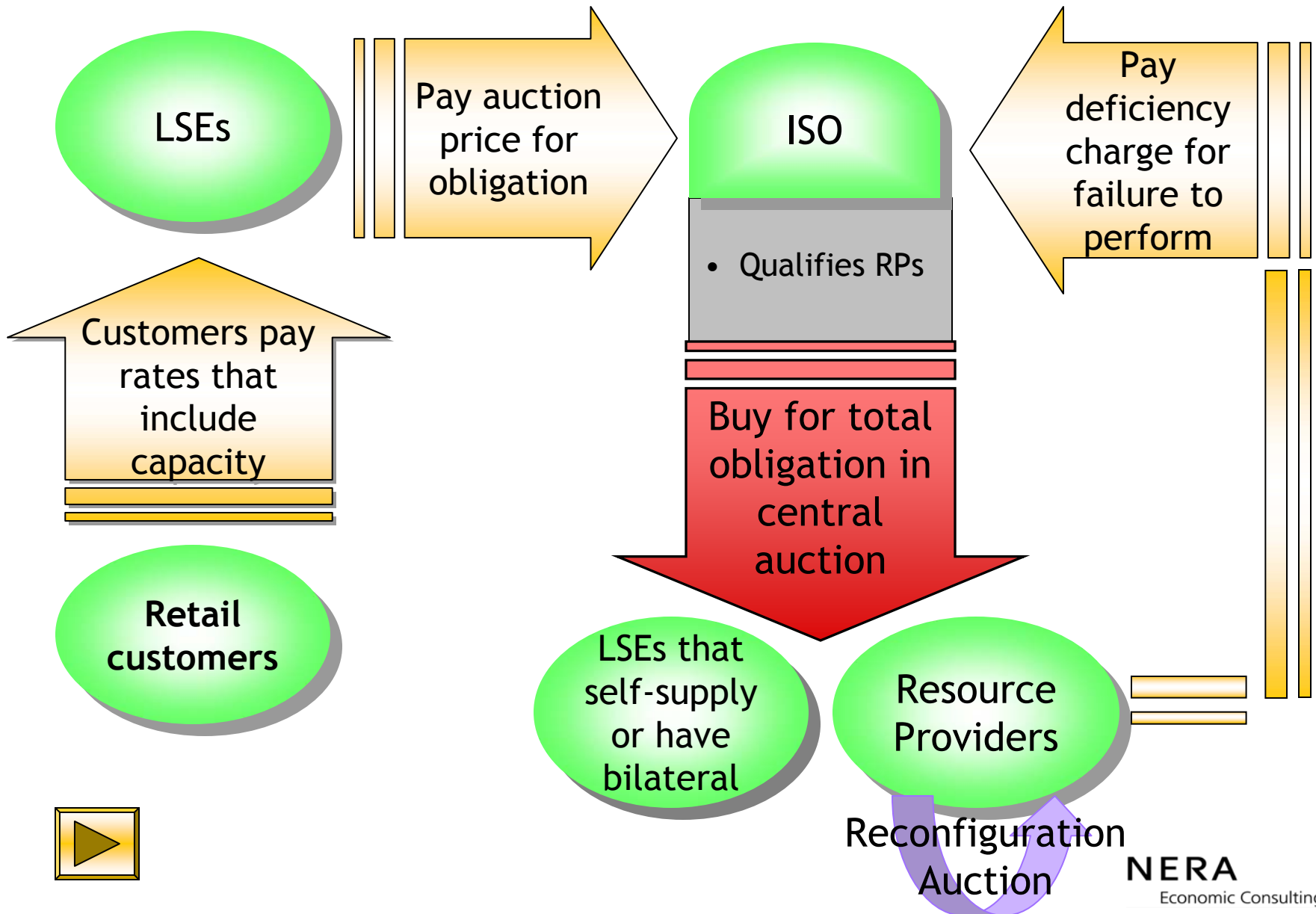
Agenda

- Schematic Representations of Current and Proposed Systems
- Overview of central auction and timeline in the Proposed System
- Summary Comparisons of Current and Proposed Systems
- How the Current System Fulfills Adequacy Objectives

Current Market



Proposed Market



Structure of Central Auction is a Descending Clock

Round 1

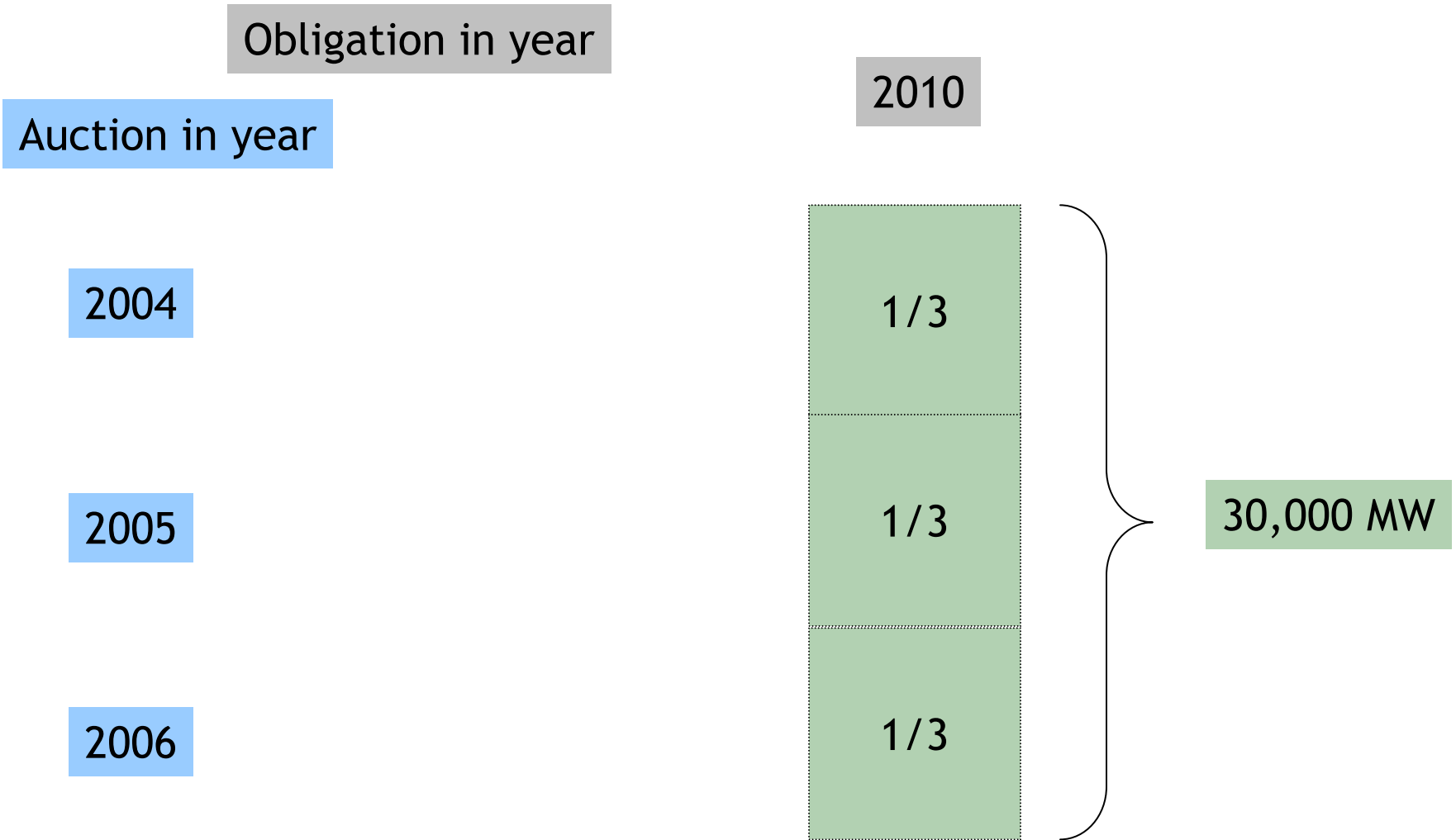
Region	Charge (\$/kW-year)	Bid ('000 MW)	needed ('000 MW)	Excess supply	Ratio
NYC	\$220.00	10	10	0	0.000
NY-ROS	\$195.00	75	25	50	1.000

Round 2

Region	Charge (\$/MW-day)	Bid ('000 MW)	Needed ('000 MW)	Excess supply	Ratio
NYC	\$220.00	25	10	15	0.300
NY-ROS	\$192.50	50	25	25	0.700

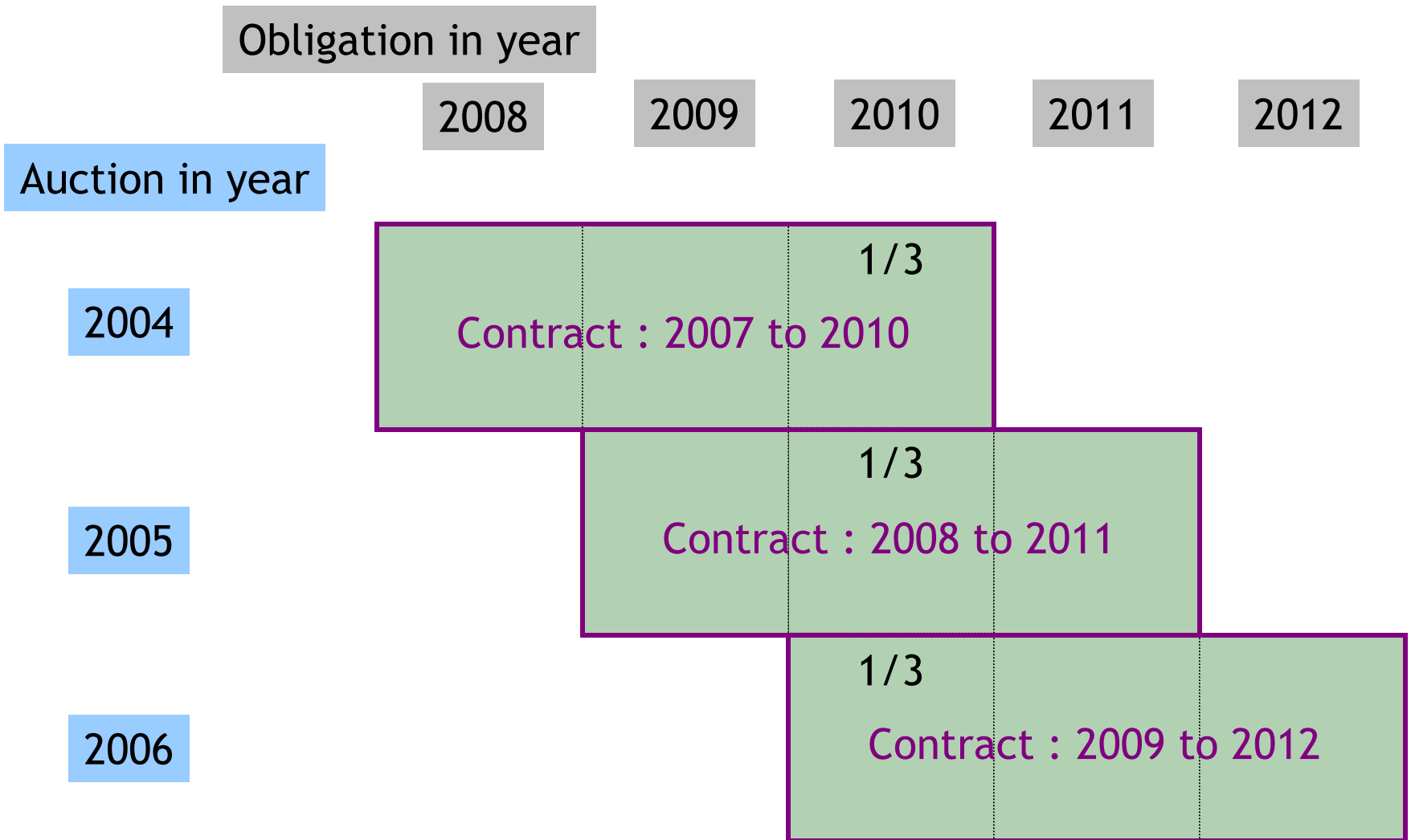
- ✓ Auction format can work with load-pockets, or with restrictions on the physical locations of resources
- ✓ Auction format can work with VRR

The Obligation For a Given Year Is Procured Through Three Auctions.



- ✓ Lead time sufficient to enable planned resources to compete

There is an Auction Every Year. Resource Providers Bid for 3-Year Contracts.



Illustrative Timeline Leading Up To Auction

Resource Providers

Assess opportunities

Sept 15

Promotion of economic opportunity

Information provided to bidders and training

Submit qualifications including indicative offers

Nov 30

Announce range of possible starting prices

Dec 15

Qualify bidders and assess strength of competition

Jan 10

Set starting price

Economic decision on basis of auction result

Feb 5

Auction

Feb 10

ISO

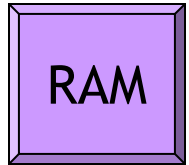
Anchor of System

NOW

RAM

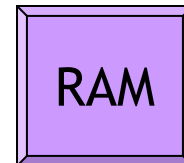
Current	Proposed
<p>Bilateral contracts</p> <ul style="list-style-type: none">▣ Market has little information on transaction prices	<p>Central auction</p> <ul style="list-style-type: none">▣ Process provides a transparent price setting mechanism
<p>Buyers: LSEs</p> <ul style="list-style-type: none">▣ LSEs have a requirement to meet their daily or monthly obligations	<p>Single buyer: ISO</p> <ul style="list-style-type: none">▣ ISO can set and meet long-term adequacy goal
<p>Sellers: existing resource providers and demand resources</p>	<p>Sellers: existing resource providers, prospective entrants, and demand resources</p>
<p>Buyers have the obligation</p>	<p>Sellers have the obligation</p>

Supporting Elements



Current	Proposed
<p>Capacity Auctions</p> <ul style="list-style-type: none">▣ Serve as residual market for LSEs that must acquire resources to honor commitments	<p>Reconfiguration auction</p> <ul style="list-style-type: none">▣ Serve as a residual market for resource providers that must acquire resources needed to honor commitments
<p>Spot market</p> <ul style="list-style-type: none">▣ LSEs can acquire capacity as needed to meet obligation on a daily basis	
<p>Deficiency Charge</p> <ul style="list-style-type: none">▣ LSEs pay if cannot meet obligation	<p>Deficiency Charge</p> <ul style="list-style-type: none">▣ Resource providers pay if cannot meet obligation

Time Horizon and Incentives for Advance Procurement



Current	Proposed
<p>Retailers</p> <ul style="list-style-type: none"> ☐ incentives for advance procurement limited by nature of retail obligation and potential for switching 	<p>ISO plans advance procurement</p>
<p>POLRs</p> <ul style="list-style-type: none"> ☐ no incentives for advance procurement aside from initial long term obligation 	
<p>Mis-match of horizon to plan procurement and horizon for developers to plan new resources</p>	<p>Match of horizon to plan procurement and horizon for developers to plan new resources</p>

Nature of the Competition

NOW

RAM

Current	Proposed
<p data-bbox="83 401 311 444">Bilaterals</p> <ul data-bbox="204 479 929 572" style="list-style-type: none"><li data-bbox="204 479 929 572">▣ Existing resources compete; no information filters to market	<p data-bbox="1016 401 1389 444">Central Auction</p> <ul data-bbox="1137 479 1785 815" style="list-style-type: none"><li data-bbox="1137 479 1785 629">▣ Participants can learn market information and refine their bids<li data-bbox="1137 665 1785 815">▣ Market to get at least some and potentially all of the auction information
<p data-bbox="83 652 484 695">Residual Markets</p> <ul data-bbox="204 731 880 886" style="list-style-type: none"><li data-bbox="204 731 880 886">▣ Low volume as some existing resources compete; market knows clearing price	<p data-bbox="1016 922 1450 965">Planned resources</p> <ul data-bbox="1137 1001 1785 1293" style="list-style-type: none"><li data-bbox="1137 1001 1785 1043">▣ compete<li data-bbox="1137 1072 1785 1165">▣ economic decisions on the basis of the market outcomes<li data-bbox="1137 1200 1785 1293">▣ “boom or bust” entry less likely to occur
<p data-bbox="83 922 900 965">Planned resources and developers</p> <ul data-bbox="204 1001 919 1222" style="list-style-type: none"><li data-bbox="204 1001 919 1043">▣ do not compete<li data-bbox="204 1072 919 1222">▣ rely on expectations of market outcomes, which may result in too little or too much entry	

Drivers of Price

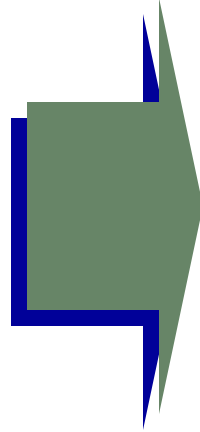
NOW

RAM

Current	Proposed
Visible capacity price comes from residual market with low volume	Visible capacity price comes from central auction for full obligation
<p>Price determinants</p> <ul style="list-style-type: none">▣ Low volumes▣ Outside opportunities to trade▣ Competition limited to existing players▣ Demand and supply are known▣ Known whether too little or too much capacity is available▣ Two-sided sealed bidding	<p>Price determinants</p> <ul style="list-style-type: none">▣ Highest volumes▣ No subsequent opportunity to trade▣ Competition open to planned resources▣ Uncertainty about availability of existing or planned supply▣ Uncertainty about extent of excess▣ Open bidding
Result is a volatile price that is not representative of long-term value	Result expected to be a price that is representative of long-term value

Adequacy Is A Long-Term Goal To Be Supported By investment Well In Advance of Operations

1. The RAM should reflect the long-term nature of adequacy.

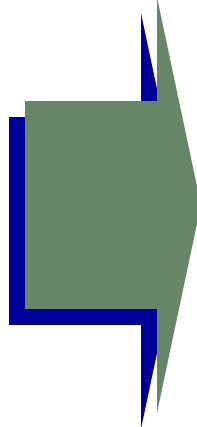


- Planned resources should be allowed to participate.
- Winning or losing at the auction should be material to the decision to continue developing a resource.
- Winners should be provided with revenue assurance for a reasonable period.

- ✓ Holding the auction three years ahead of when capacity is needed allows planned resources to participate
- ✓ A three-year contract provides revenue assurance
- ✓ Both features together means that auction results can enter materially in the development decision

Adequacy Is To Be Supported In An Environment With Retail Choice

2. The RAM should meet challenges raised by the availability of retail choice in most states.

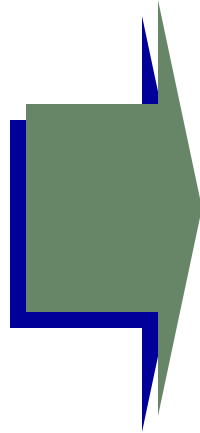


- Customers are not committed to POLR so that POLR providers have no incentive for long-term planning.
- Retailers contract with customers for terms that are far shorter than life of assets used to supply them.
- Retailers benefit from certainty regarding the capacity price and from the availability of hedging strategies.

- ✓ With an auction three years ahead and with resource providers committing for a three-year period, the focus moves toward long-term planning
- ✓ Retailers and POLRs know the capacity charge well in advance
- ✓ Retailers can enter bilateral contracts or self-supply; retailers can hedge their positions although not perfectly

Achieving Adequacy Must Harness and Support the Competitiveness of Wholesale Markets

3. The RAM should deliver the chosen level of adequacy at least cost - at a competitive price.

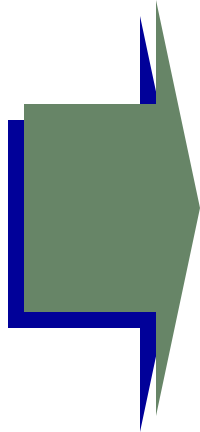


- All existing resources as well as planned resources should compete together in one process.
- The auction structure should provide market information that resource providers used to refine their bids.
- Auction process should not be overly vulnerable to the transient market circumstances.

- ✓ Holding the auction three years ahead of when capacity is needed allows planned resources to compete with existing resources; more competition means lower prices and reduced reliance on bid caps.
- ✓ A clock auction provides market information that allows bidders to refine their bids.
- ✓ The rolling auction structure mitigates vulnerability to transient events.

Achieving Adequacy Requires Resource Providers To Make Meaningful Economic Decisions Based on Auction Prices

4. The RAM should provide meaningful price signals to resource providers.

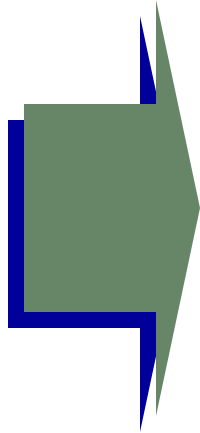


- Capacity price should be competitively determined by the market.
- The pattern of auction prices should provide a reliable signal over time for the development of new resources.
- The auction price should not be unduly influenced by transient events.

- ✓ Auction format promotes an openly competitive process.
- ✓ Offer caps and mitigation relevant only when participant pool will not yield a competitive outcome.
- ✓ The rolling auction structure means that price signal is frequent and more likely to be resilient to the influence of transient events.

Achieving Adequacy Requires Assurances Against Non-Performance

5. The RAM should include protections and mechanisms to minimize the risk of non-performance.

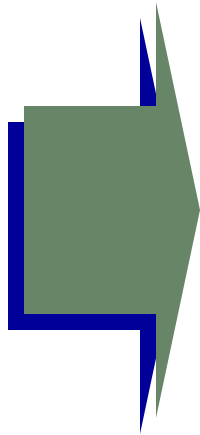


- RAM makes arrangements for resources well in advance of when they are needed.
- Resource providers should have financial incentives to perform.
- Resource providers should have an opportunity to trade to meet their obligations if resources are not available as planned.

- ✓ Qualification criteria must be developed to minimize risk of non-performance.
- ✓ Deficiency charge provide additional financial incentives for resource providers to meet their obligations.
- ✓ Reconfiguration auctions provide the opportunity for resource providers to contract to fill any gaps in their ability to meet their obligations.


Achieving Adequacy Efficiently Requires Participation of all Resources

6. The RAM should strive to include all resources that can contribute to adequacy.



- Planned resources and demand resources should be able to contribute in the process.
- Demand resources may operate on business models that makes it difficult to offer their resources in the same time frame as generation.
- Resources located outside the ISO can compete.

- ✓ A transitional set-aside for demand resources should allow demand resource to contribute while business plans adapt.
- ✓ Deficiency charge provide some additional financial incentives for resource providers to meet their obligations.
- ✓ Reconfiguration auctions provide the opportunity for resource providers to contract to fill any gaps in their ability to meet their obligations.



Taken together, the elements of the RAM achieve the objectives set by the RAM Group