The Role and Value of Demand Response Resources in a Central Resource Adequacy Model

Presented to NYISO PRL WG

NERA/Neenan Associates

November 7, 2003

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Outline

1.0. Overview of the CRAM concept

2.0 Survey of demand response resource providers and purveyors

3.0 Demand Response participation in CRAM

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The RAM Group Specified the Scope of NERA's Recommendations

1. **Planning horizon –** the length of time between the auction and the time at which the winners must start providing resources committed through the auction.
2. **Commitment period** – the length of time for which the winners at the auction commit resources
3. **Auction format** – the way bidding is organized and competition among resource providers is fostered
4. **Percent procured** – whether the full requirement is procured through one or several auction
5. **Monitoring and Mitigation –** market design features that aim to prevent the exercise of market power or gaming and analysis of market information to assess performance in relation to a competitive benchmark
6. **Variable resource requirement** – whether the demand curve should be added to the model

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Summary Recommendations

Planning Horizon	3 Years
Commitment Period	3 Years
Percent Procured	3-year rolling
Auction Format	Clock Auction
Variable RR	**Possible but not necessary**
Monitoring	**Bundle of measures to protect competition**

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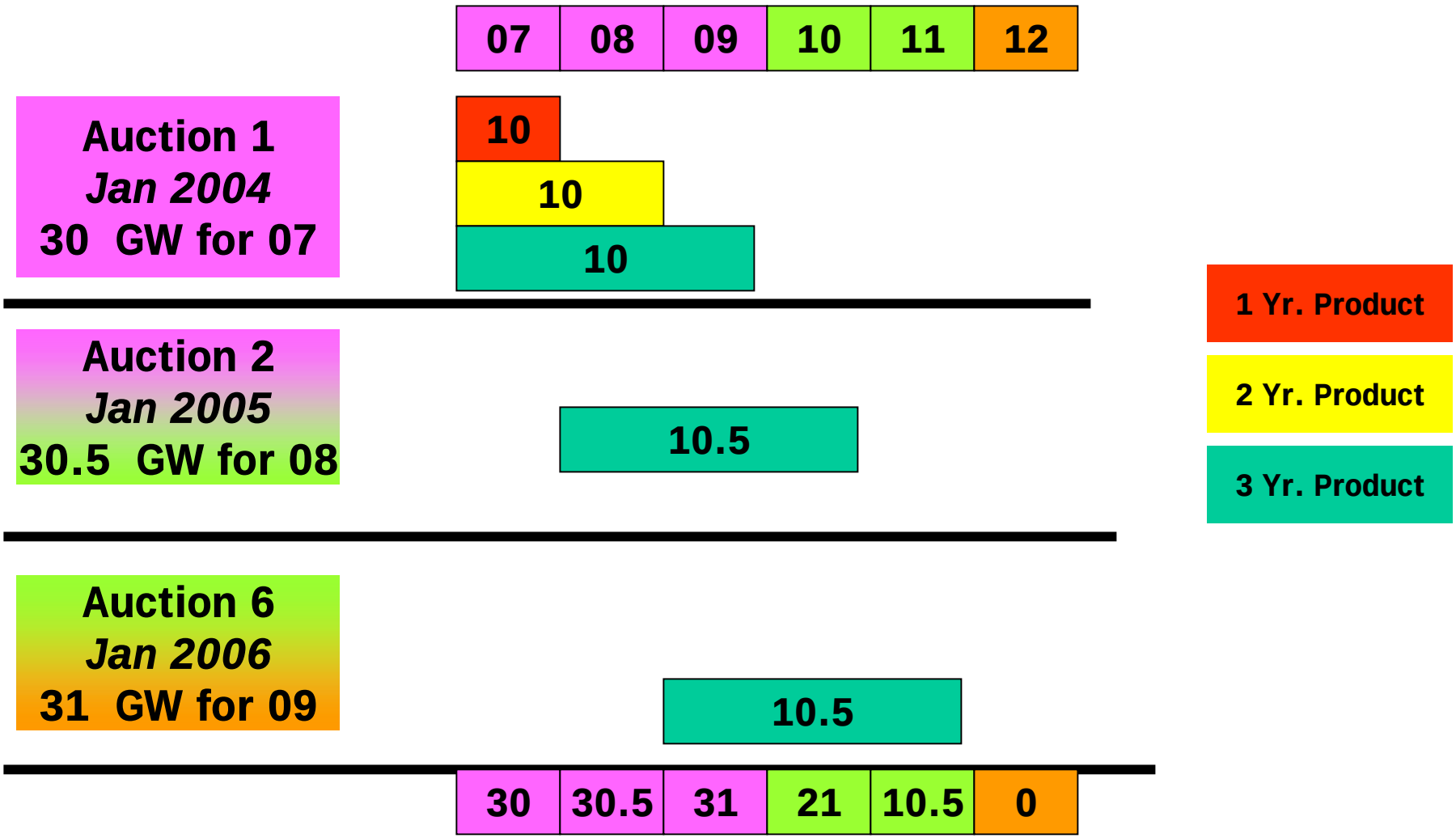
Example of Rolling Option with a Fixed 3-Year Commitment



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Descending Clock Means Minimal Risk for Providers

- Multi-product design possible
  - MWs for all products are procured at once
  - Initial auctions may be for one ISO only
- **Bidding proceeds in rounds**
  - Suppliers state how many MW they want to supply at prices suggested by the Auction Manager
  - Prices tick down if there is excess supply
  - Suppliers could switch their bids from one product to another in a given auction if it is for multiple products

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NERA Interviewed A Group of Market Players in Merchant Generation

- **Planning Horizon** – general consensus that lead time of process should correspond to the time required to develop new capacity: **2 to 4 years**
- **Commitment period**
  - **lenders generally said 10 years or more;**
  - **developers tended to accept less than 10 years could be less than 10 years**

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Survey of Demand Response Providers and Customers

- Survey conducted in September-November of 2003
- Survey gauges retail customers' & DR providers' preferences for alternative:
  - Commitment periods (CP) -- six mo. to 3 yrs.
  - Planning horizons (PH) -- one to 3 yrs

  under a Centralized resource Adequacy Market design
- Results are sorted by Q*uestion 20*, type of business

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Sampling Frame and Responses

- **Survey distributed by DR program managers at**
  - **ISO-NE**
  - **NYISO**
  - **PJM Interconnection**

Also sent to vendors and other stakeholders

Respondents by ISO	
PJM	8
NYISO	9
ISO-NE	7
Multiple ISO	6
None	3
TOTAL	33

Respondent Identity	
Regulated LSE	9
Competitive LSE	7
Demand Service Provider	9
Retail Customers	8
TOTAL	33

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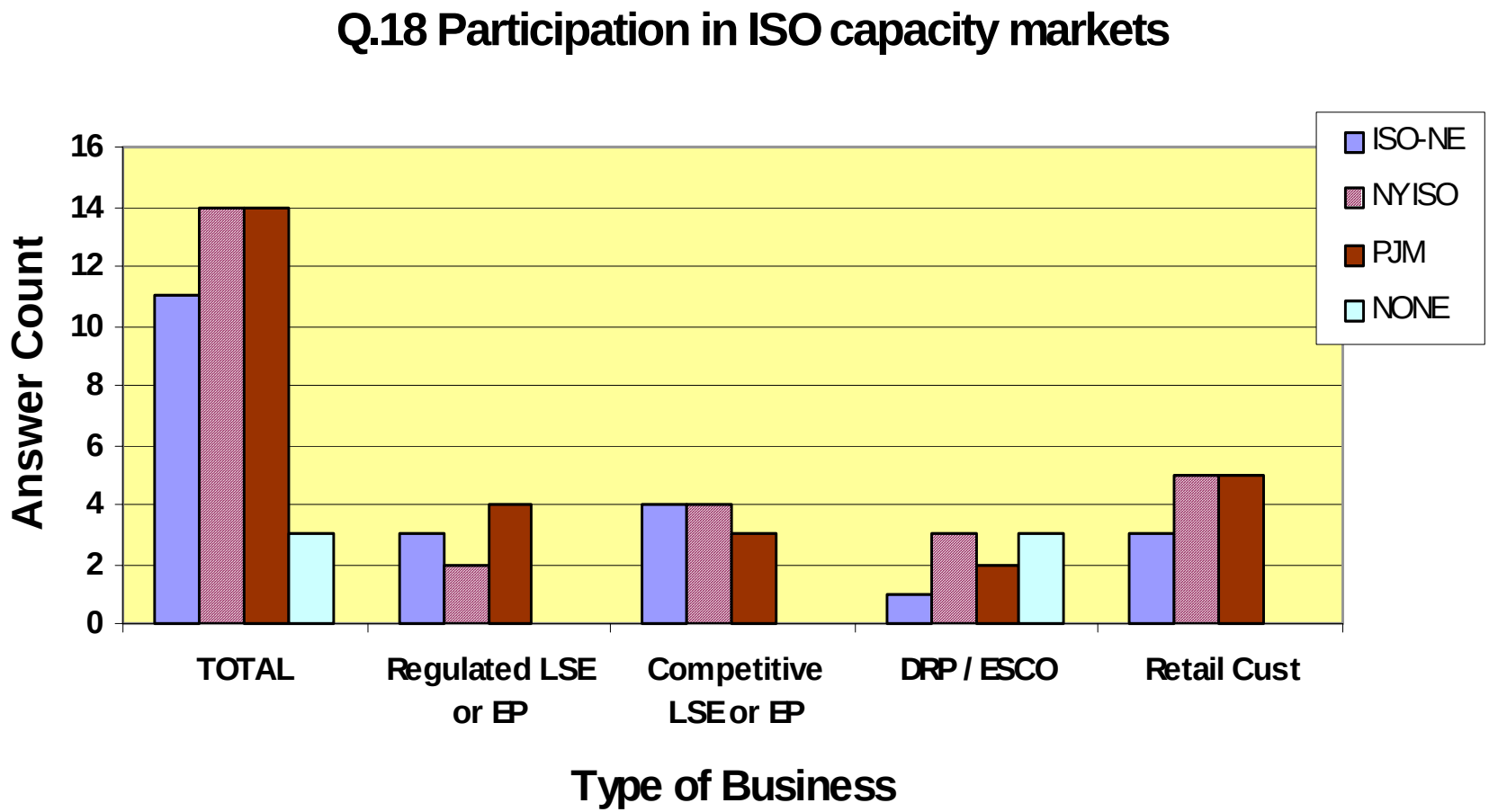
Q. 18

Respondents by Capacity Market Participation



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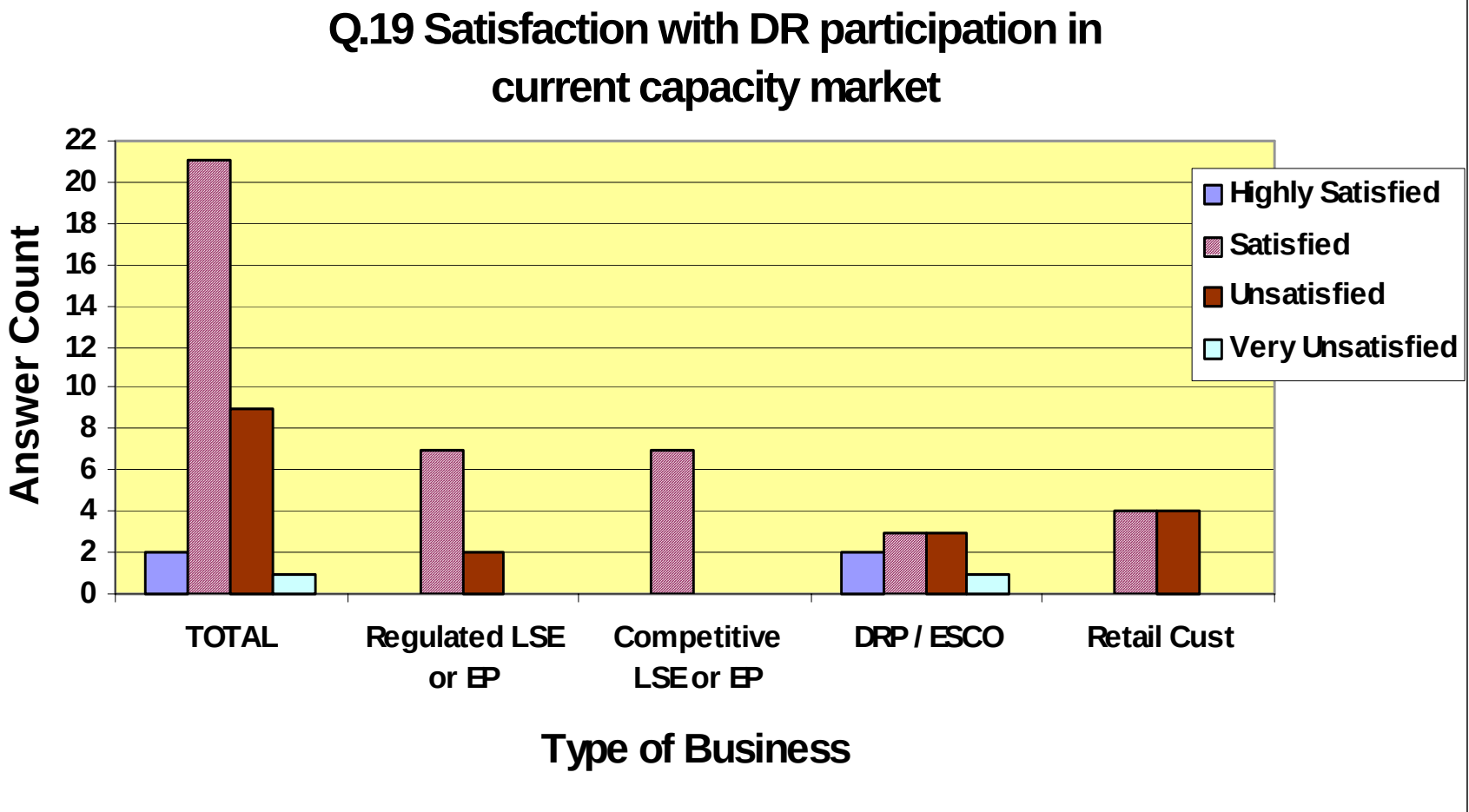
Q. 19

Generally satisfied with things as they are now



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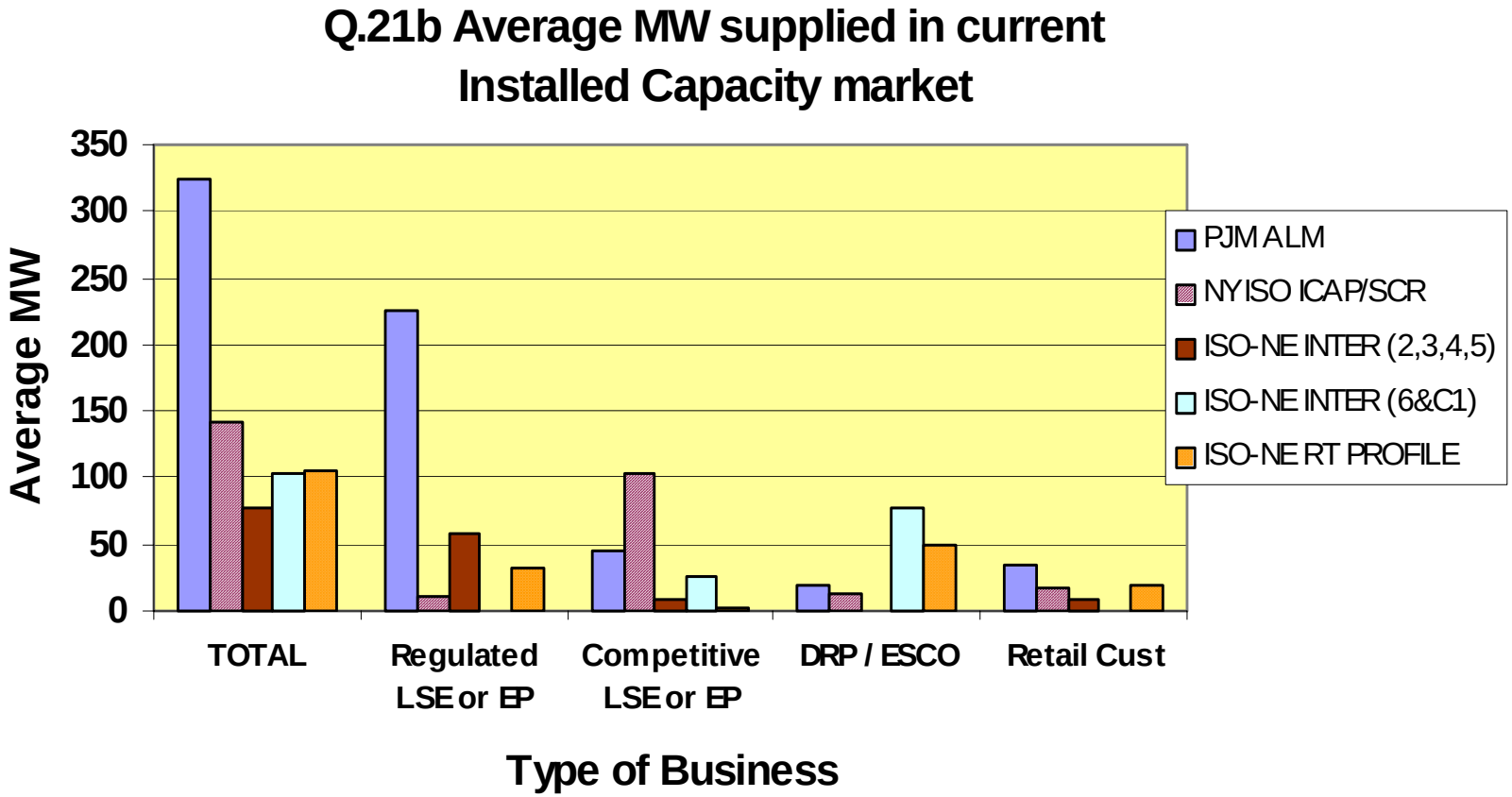
Q. 21b

Respondents currently provide 1200 MW of participation



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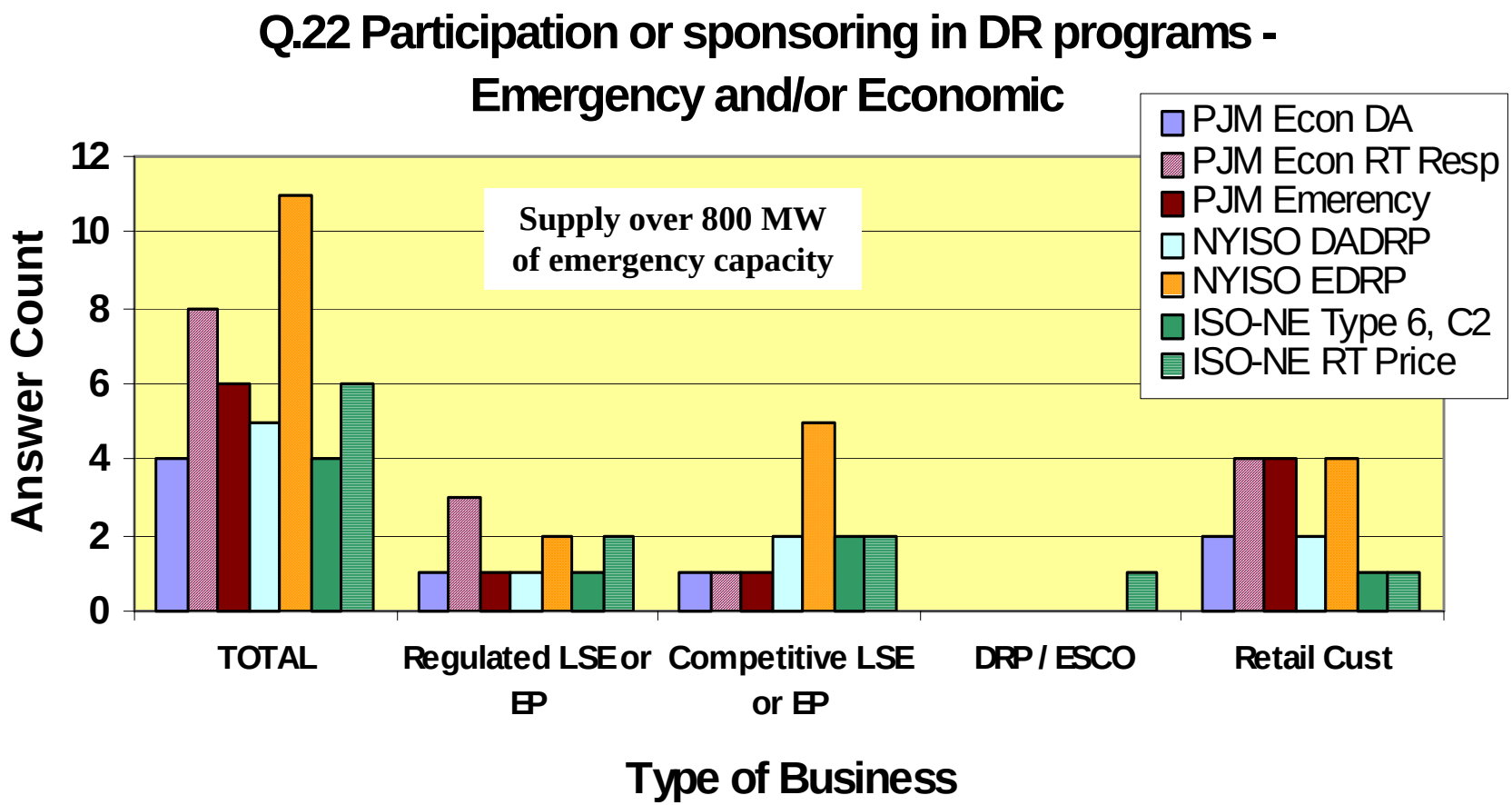
Q. 22

Also provide over 800 MW of emergency program participation



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Q. 5-14

Overall CP and PH Ranking

- Overall strong preference for shorter (6 month to 1 year) CP and PH
- Strong aversion to long (3 year) CP and PN
- The CP/PH of 1 year is slightly more attractive to DRPs than to others
- DRPs show the greatest diversity of response, with some favoring a shorter and others a longer CP and PH

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Question 15

Respondents were asked to rank 16 parings, involving four different levels of commitment period and four levels of the planning horizon, from 1 to 16, where 1 was the highest score and 16the lowest.

Results are reported separately for:

- **Regulated LSE**
- **Competitive LSE**
- **Demand Service Provider**
- **Retail Customer**

By individual CP/PH pair average score and score by feature quadrants

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Q. 15 Ranking of Alternative CP and PH:

Average Pair Scores

Regulated LSE or EP

Commitment Period \ Planning Horizon	6 mo.	1 yr.	2 yr.	3 yr.
6 mo.	3	3	5	8
1 yr.	4	4	6	9
2 yr.	8	9	10	13
3 yr.	12	12	14	16

Indicate preference for all sixteen combinations:
1= Highest preference, 16= Lowest preference

Competitive LSE or EP

Commitment Period \ Planning Horizon	6 mo.	1 yr.	2 yr.	3 yr.
6 mo.	3	3	6	10
1 yr.	3	4	7	11
2 yr.	7	8	11	14
3 yr.	11	11	13	16

Indicate preference for all sixteen combinations:
1= Highest preference, 16= Lowest preference

DRP / ESCO

Commitment Period \ Planning Horizon	6 mo.	1 yr.	2 yr.	3 yr.
6 mo.	5	6	9	11
1 yr.	5	6	10	11
2 yr.	6	7	9	11
3 yr.	8	9	11	13

Indicate preference for all sixteen combinations:
1= Highest preference, 16= Lowest preference

Retail Cust

Commitment Period \ Planning Horizon	6 mo.	1 yr.	2 yr.	3 yr.
6 mo.	2	3	6	10
1 yr.	3	3	7	10
2 yr.	7	8	11	14
3 yr.	10	12	14	16

Indicate preference for all sixteen combinations:
1= Highest preference, 16= Lowest preference

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Q. 15 Ranking of Alternative CP and PH:

Average Quadrant Scores

Regulated LSE or EP

Commitment Period \ Planning Horizon	6 mo.	1 yr.	2 yr.	3 yr.
6 mo.	3.4		7.3	
1 yr.				
2 yr.	10.2		13.2	
3 yr.				

Indicate preference for all sixteen combinations:
1= Highest preference, 16= Lowest preference

Competitive LSE or EP

Commitment Period \ Planning Horizon	6 mo.	1 yr.	2 yr.	3 yr.
6 mo.	3.1		8.4	
1 yr.				
2 yr.	9.2		13.3	
3 yr.				

Indicate preference for all sixteen combinations:
1= Highest preference, 16= Lowest preference

DRP / ESCO

Commitment Period \ Planning Horizon	6 mo.	1 yr.	2 yr.	3 yr.
6 mo.	5.5		10.2	
1 yr.				
2 yr.	7.5		10.8	
3 yr.				

Indicate preference for all sixteen combinations:
1= Highest preference, 16= Lowest preference

Retail Cust

Commitment Period \ Planning Horizon	6 mo.	1 yr.	2 yr.	3 yr.
6 mo.	2.7		8.4	
1 yr.				
2 yr.	9.2		13.8	
3 yr.				

Indicate preference for all sixteen combinations:
1= Highest preference, 16= Lowest preference

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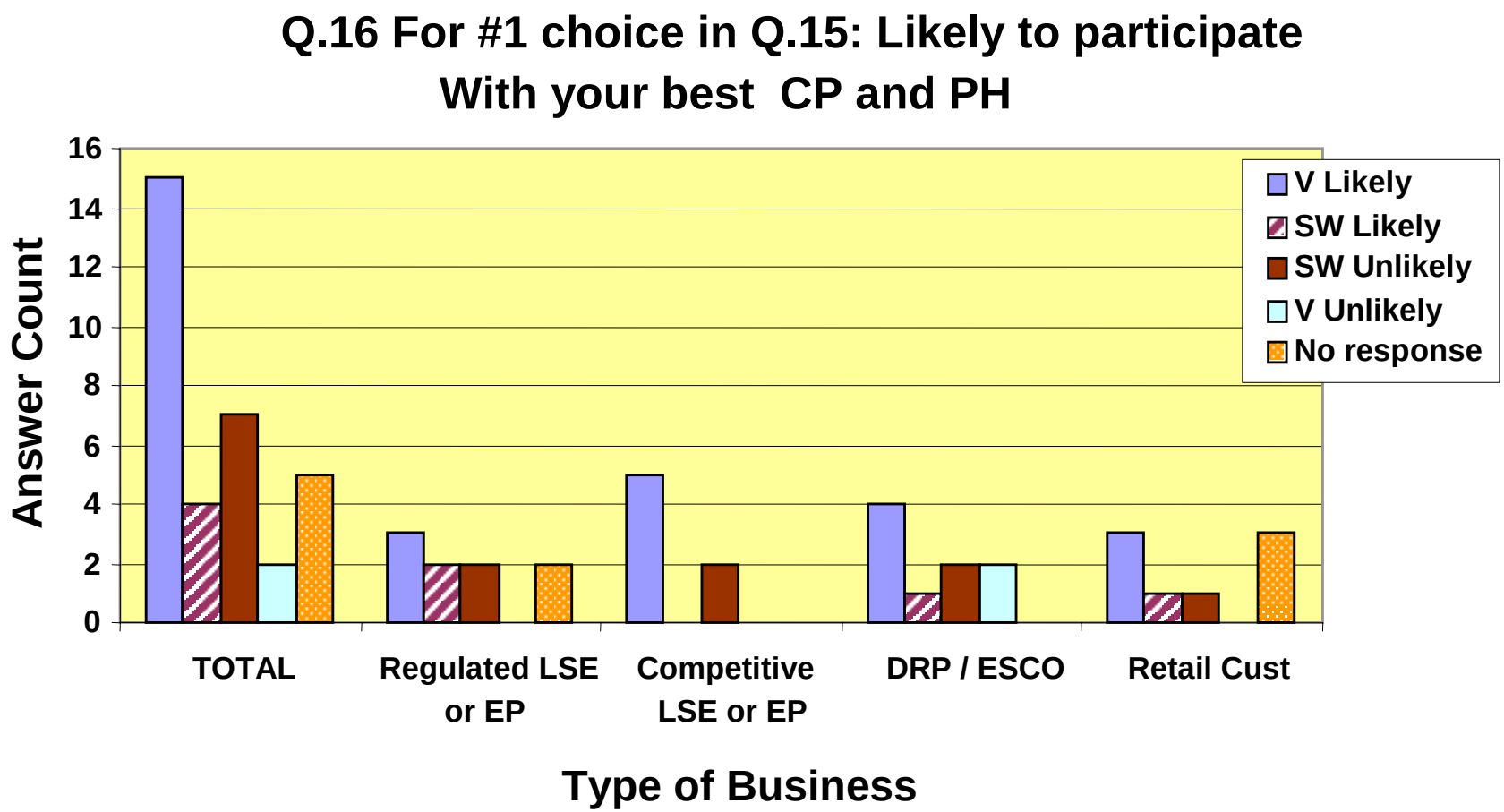
Q. 16

Respondents report that they are much more likely to participate if they get their CP and PH choice



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Q. 16

Can 3 Yr. CP be made palatable?

- **Provisions that would make a 3-year CP more acceptable**
  - **#1 Limit noncompliance penalty to amount paid (most important to DSP)**
  - **#2 Periodic reconfiguration auctions (most important to competitive LSEs)**
- **Conversely: Limiting curtailments to only the summer or winter months was mentioned by only three respondents**

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Summary

- DR providers and customers generally prefer a CRAM design with a one-year CP and PH
  - the opposite of that expressed by generation financing interests that prefer 5 years or longer
  - Shorter than appears to be sufficient to support robust competition, 2-3 years
  - Diversity of DR preferences suggests some see longer as better

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Summary

- **The impact of a longer CRAM would be lower DR participation in an equivalently structured ICAP market programs**
  - **Respondents indicate that they'd supply 1,200 MW under a CRAM of their choice (short CP and PH)**
  - **Increasing the CP or PH to one year would reduce that amount somewhat, but not substantially**
  - **Increasing the CP or PH to three years reduced participation by 80-85%, from ~1,200 MW to ~240**

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Ways to incorporate DR into the CRAM

1	**DR competes against generation and other qualified UCAP suppliers in CRAM auctions**
2	**Conduct separate CRAM auction for DR to provide a specified set-aside ICAP**
2a	**Offer DR in the CRAM but as a separate product with different CP and PH features**
3	**Provide incentives for Generators to include DR in their portfolio**
5	**Administer DR program separately from CRAM auction but pay market clearing price**
6	**Give preference to DR in reconfiguration auctions**

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