PJM Demand Response Symposium

Mid-Atlantic Distributed Resources Initiative (MADRI) Overview

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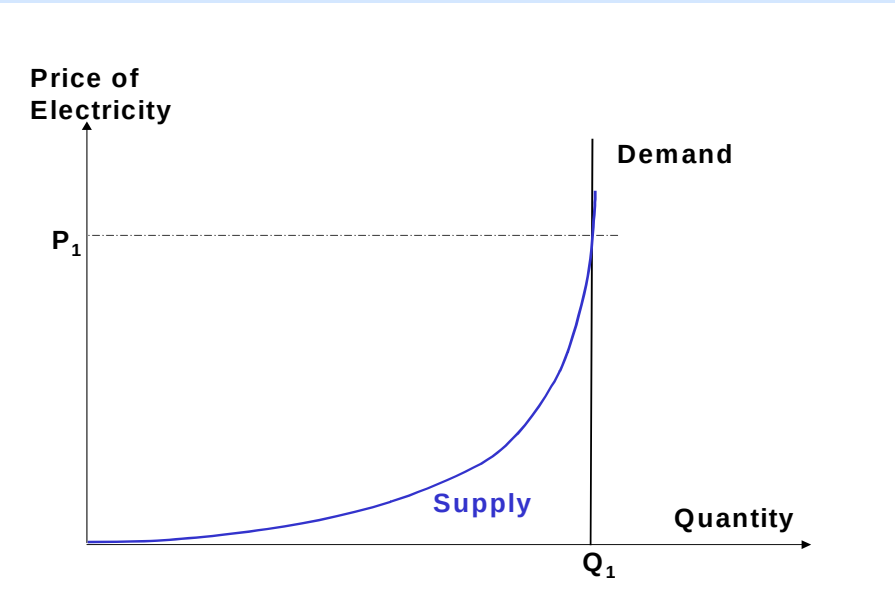
What is the Mid-Atlantic Distributed Resources Initiative (MADRI)?

- Five “classic” PJM states
- Regional approach to DR, DG, & Efficiency
- Facilitated stakeholder process with open mtgs
- Support from US DOE
  - also EPA, FERC, PJM
- MADRI ‘working group’ meets every 6-8 weeks since June of 2004

MADRI FOCUS – HOW DO WE GET MORE DR?

Primary Driver in 2004 – Foster Competition (Can you have a competitive market with a vertical demand curve?)



Primary Driver in 2007 - Mitigate Price Increases

Company	Projected Residential Rate Increases as of June/July, 2006		
	Maryland	Delaware	Virginia
BGE	72%		
Delmarva	35%	59%	42%
Pepco	39%		

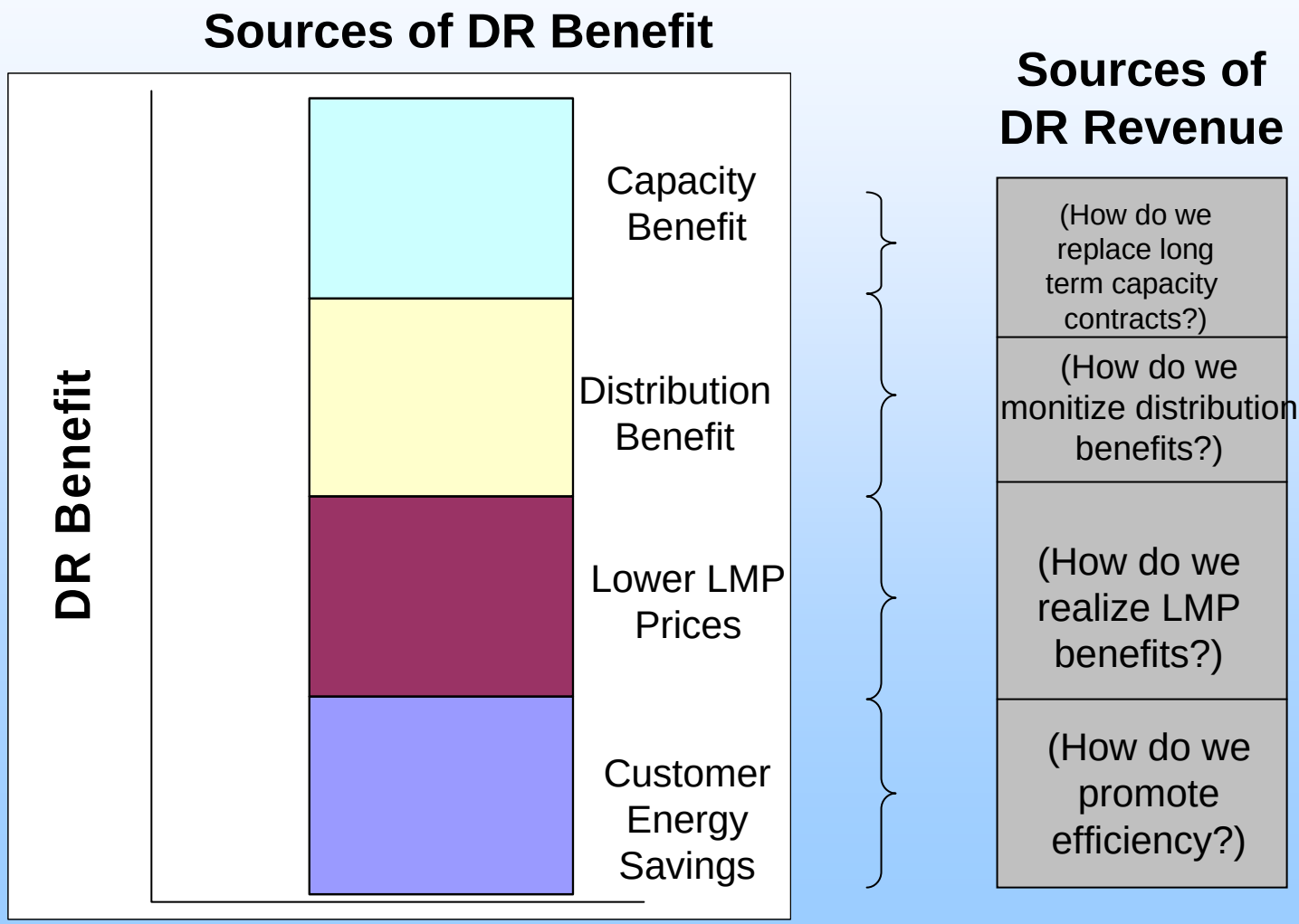
Source: Newspaper reports

MADRI Initiatives Include:

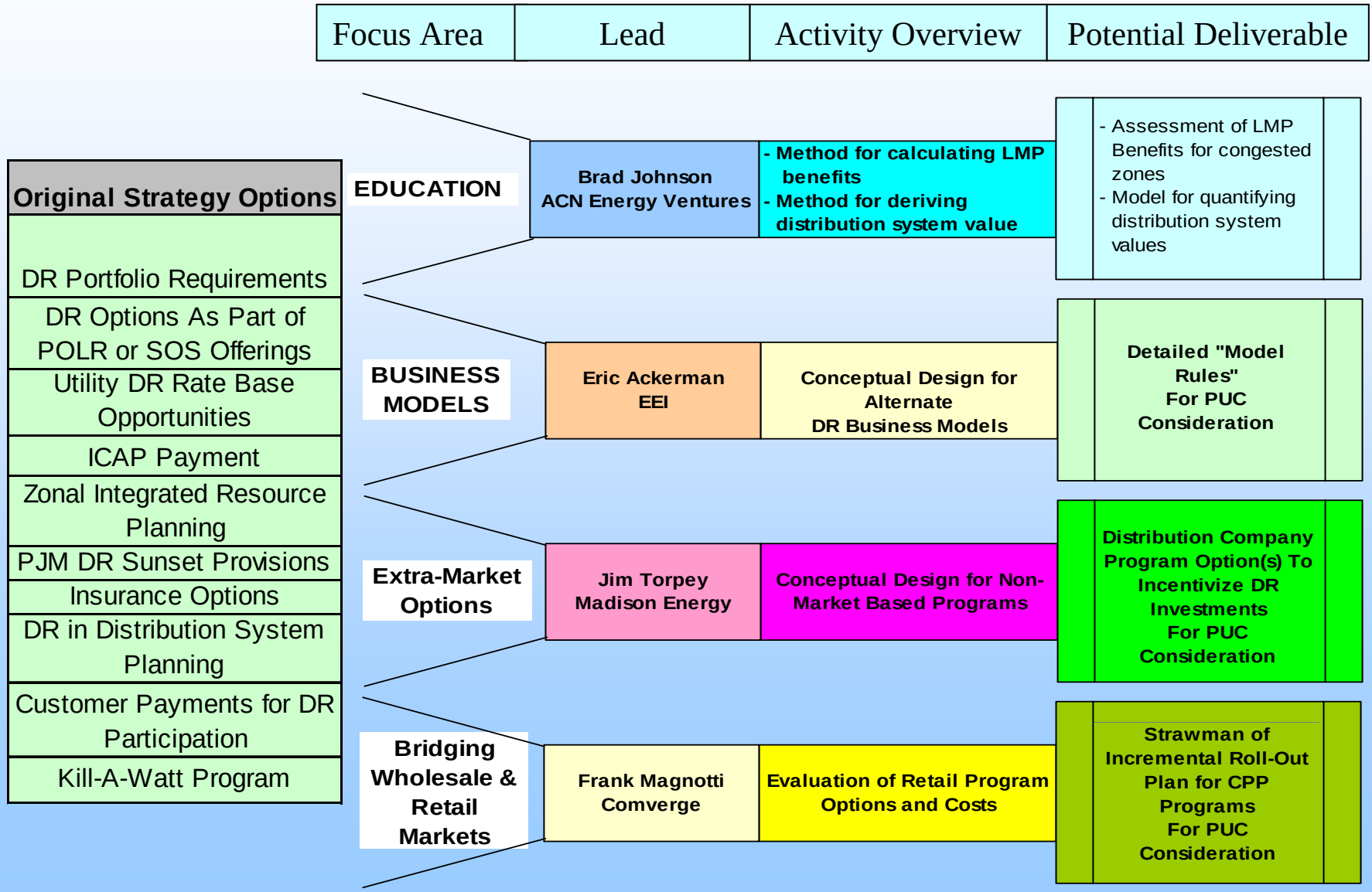
- DR Business Case Enhancement
- Metering/AMI
- State Regulatory Policy
- DG Interconnection

For more info: www.energetics.com/madri/

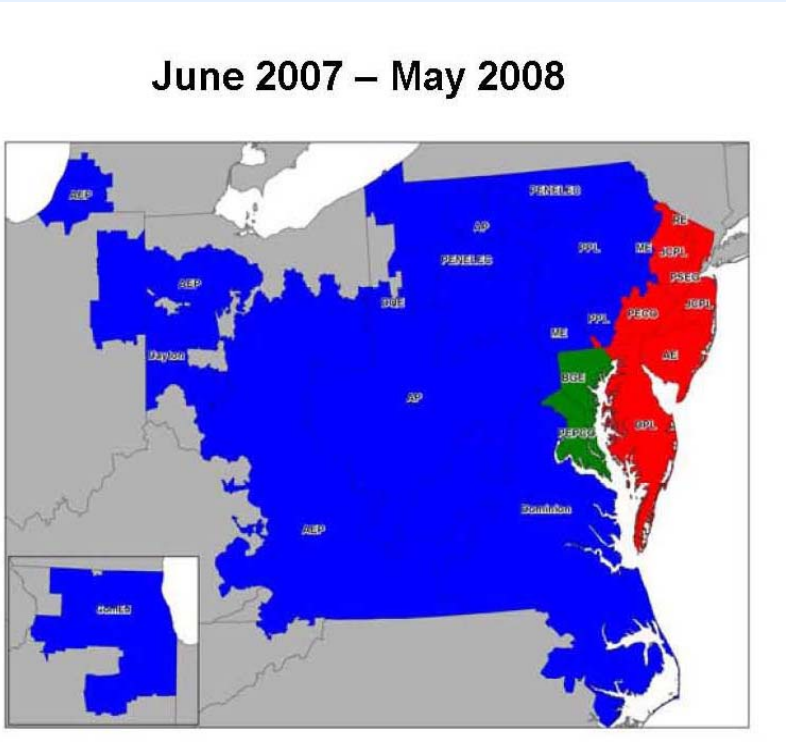
Putting the DR Value Chain Back Together is Challenging



MADRI Business Case Sub-Group Overview



Capacity Has A Much Higher Value in MADRI States

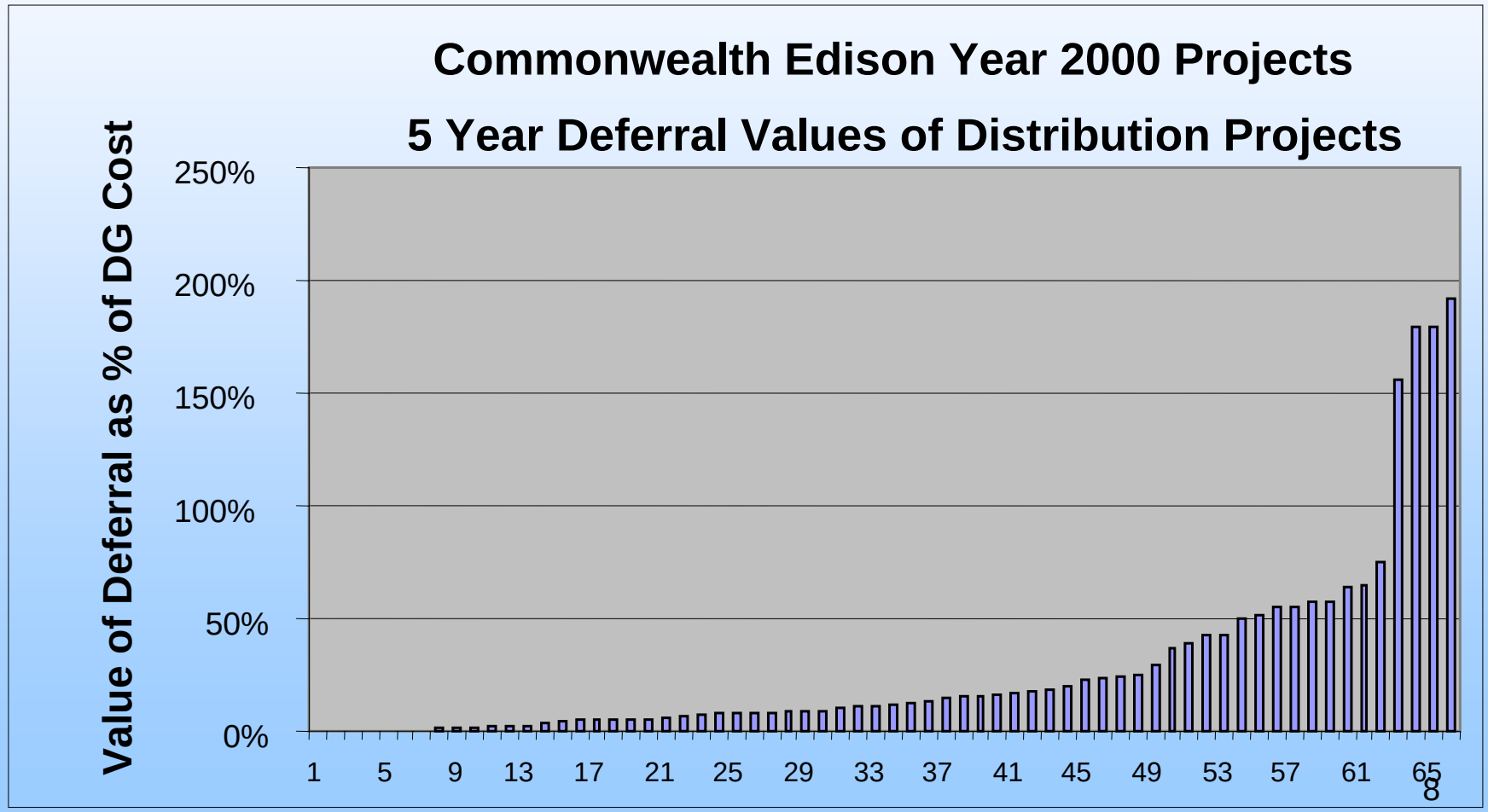


RPM Auction for 2007/2008*

- Blue (Non-MADRI States) ~ $15/kW/yr
- MADRI States ~ $65/kW/yr

*Based on 4/13/07 Market Clearing Prices

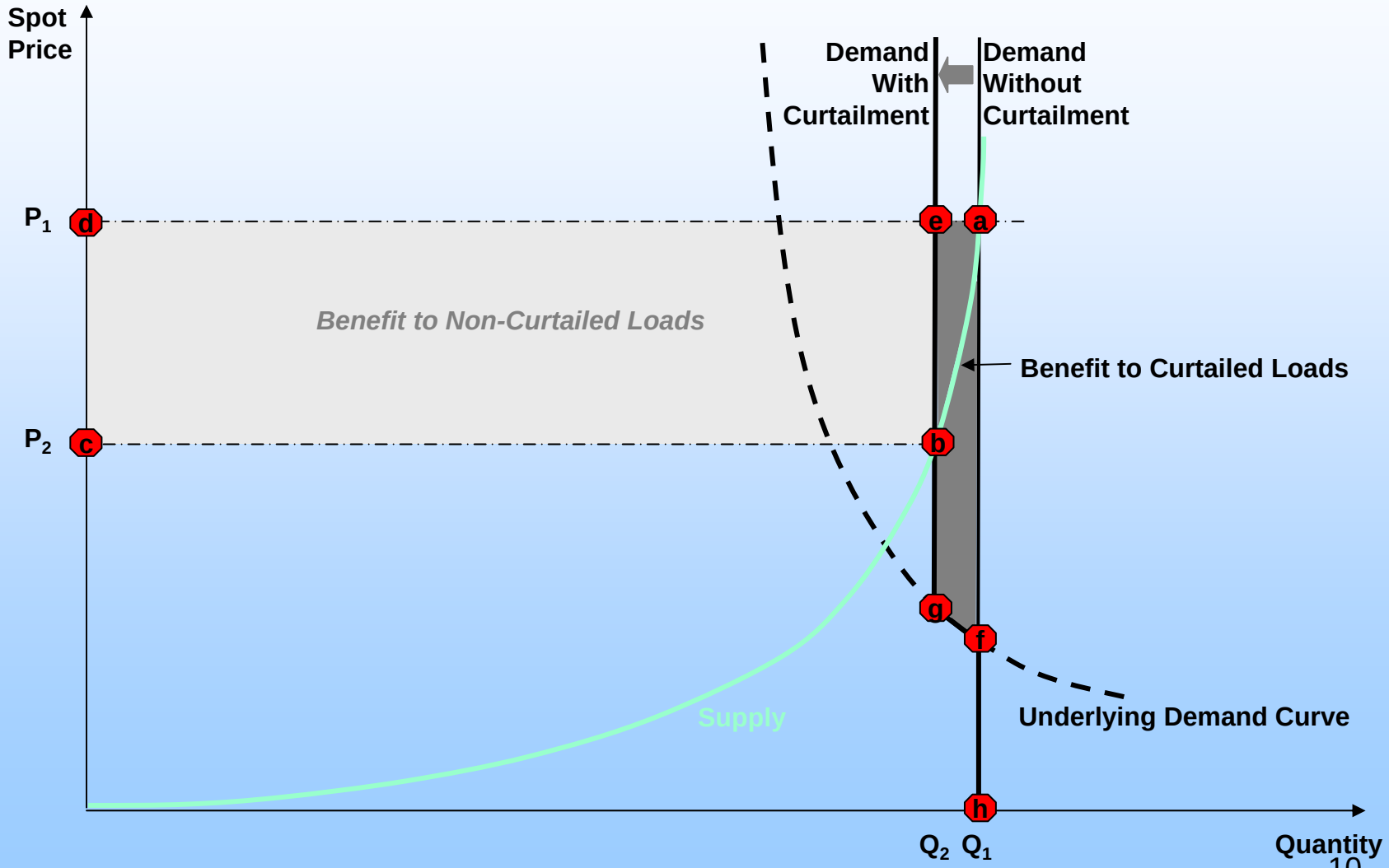
Potential Distribution Value of DR is Substantial But Difficult to Monetize



Small Load Decreases Can Have a Large Price Impact

REGION	% Change In	
	Load	LMP
California	-2.5%	-24.0%
New England	-3.5%	-37.0%
New York (By Zone)		
Capital	-3.2%	-20.1%
NYC	-0.1%	-7.4%
Long Island	-1.5%	-8.9%
Western Region	-4.4%	-25.1%
Hudson Region	-0.8%	-4.4%

Brattle Study: Conceptual Framework for DR Energy Benefits



Brattle Study: Summary of Findings

	Benefits to Non-Curtailed Load	Energy Benefits to Curtailed Load	Capacity Benefits to Curtailed Load
Benefits to MADRI States *from 3% curtailment in five zones (0.9% reduction in PJM peak load)*	**$83-184 Million** (**5-8%** price reduction in curtailed hours)	**$10-28 Million** (**$100-250/MWh** benefit in curtailed hours)	**$73 Million** (assuming **$58/kW-Yr)**

Note: Individual state benefits are greater if states act as a region instead individually

Energy Efficiency Technology Options May Have Big Impact

Blue Line Innovations Home Energy Monitor

- 400 participant pilot over 2.5 years
- Average 6.5% savings
- Savings of up to16.7% (electric hot water but no electric heat)
- Hydro One recently completed deployment of 30,000 units
- At ~$150/unit, potential for 2 year payback

MADRI AMI Activities

Installed Meter Survey http://www.energetics.com/madri/toolbox/pdfs/survey/survey.pdf

The Mid-Atlantic Distributed Resources Initiative (MADRI), with financial support from DOE, commissioned the "Installed Meter Survey" to develop a better understanding of what types of meters were currently installed in the Mid-Atlantic region and how these meters were currently being used. The report that was produced as a result of the survey presents a summary of the survey results.

AMI Workshop http://www.energetics.com/MADRI/pdfs/agenda_050405.pdf

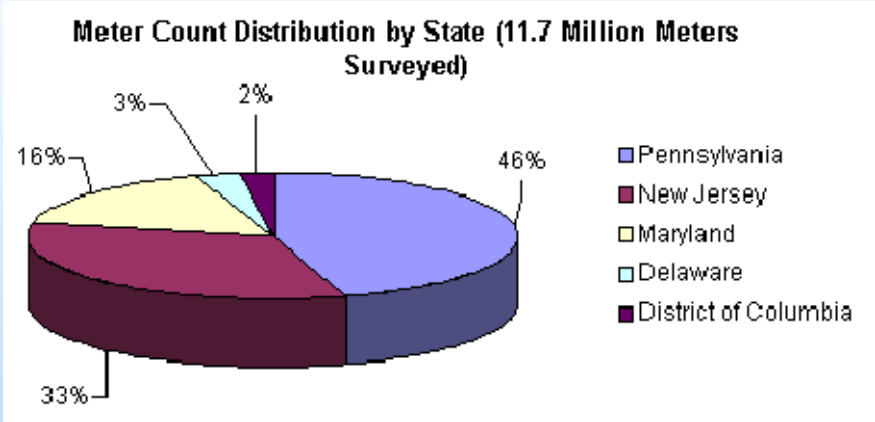
On May 4, 2005, MADRI hosted a day-long workshop on AMI. The goal was to provide state public commissioners and their staffs with a broad overview of current AMI activities including technology and business case issues. AMI experts from across North America participated. Workshop presentations can be found on the MADRI home page http://www.energetics.com/MADRI/ under the May 2005 heading.

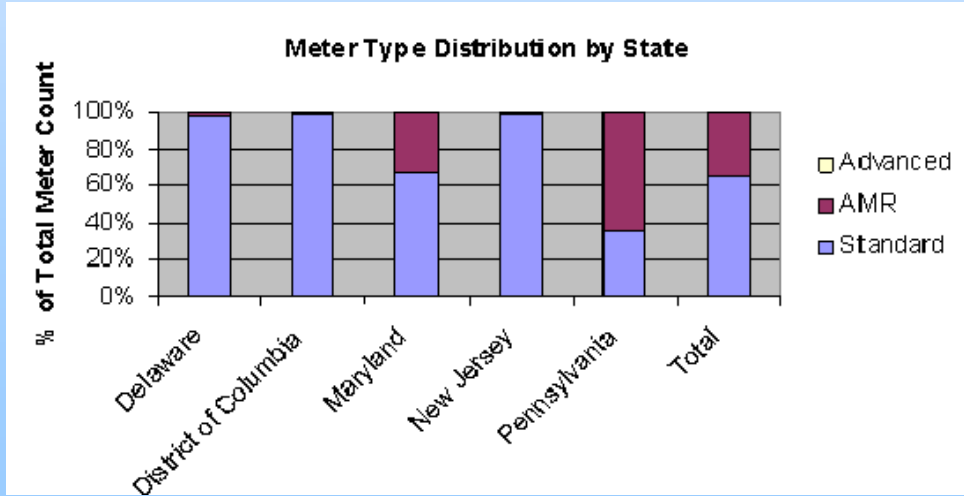
MADRI AMI Toolbox http://www.energetics.com/madri/toolbox/

The MARI Toolbox was developed to provide Mid-Atlantic PUCs with additional resources for learning more about advanced metering infrastructure (AMI). The "toolbox" was identified as a key action item following the MADRI AMI Workshop held on May 4, 2005.

MADRI Survey Results - Installed Meter Data by State

- Advanced meters are less than 1% of the meter count in all states.
- AMR meter population concentrated in Pennsylvania and Maryland utilities.
- In New Jersey, Delaware, and the District of Columbia, less than 2% of all meters are AMR and Advanced Meters.





MADRI Advanced Metering Infrastructure (AMI) "Toolbox"

A compilation of reports, studies, and other web resources related to advanced metering infrastructure options

- Return to Main
- AMI Background Information
- AMI / Vision Strategy Papers
- AMI Business Cases
- Ontario Energy AMI Plan
- Pricing Policy & Pilots
- Competitive Metering Studies
- AMI Standards
- MADRI Metering Survey
- AMI Organizations & Companies
- Individual Contact Information

The Mid-Atlantic Distributed Resources Initiative (MADRI) Toolbox was developed to provide Mid-Atlantic PUCs with additional resources for learning more about advanced metering infrastructure (AMI). The "toolbox" was identified as a key action item following the MADRI AMI Workshop held on May 4, 2005.

The AMI Toolbox represents a compilation of reports and studies as well as other web based resources that have been accumulated by MADRI support staff as they have evaluated AMI strategy options. The "toolbox" is not intended to provide a definitive library and should be viewed as a work-in-progress with the expectation that additional resources will be added as the MADRI states begin their evaluations of AMI opportunities. All of the documents contained in the "toolbox" are public documents and users should feel free to distribute them or quote from them.

URL LINK http://www.energetics.com/madri/toolbox/

2007 AMI Focus

- AMI Business Case
- AMI Technical Standards
- AMI Functional Capabilities
- Interoperability Considerations

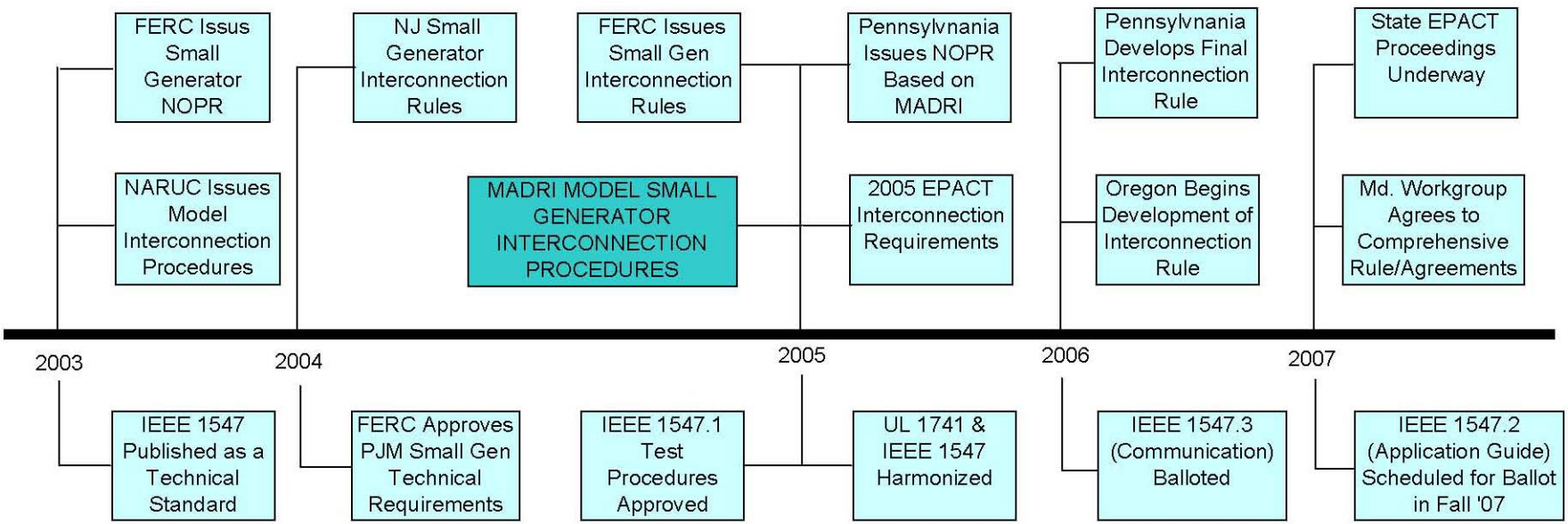
State Regulatory Policy – Revenue Decoupling

Decoupling: How it Works

- Instead of rewarding the utility for increased sales, create a system that holds the company harmless (i.e., no effect on profits) for reductions in sales due to efficiency
- Replaces traditional ratemaking with a formula that determines how ***revenues*** will change over time
- The company, knowing what revenue levels to expect, is then free to take whatever actions it wants (within other legal and accounting constraints) to improve its profitability

MADRI Has Played a Key Role in Development of of State Interconnection Procedures

Interconnection Procedures



Interconnection Technical Requirements

MADRI Policy Statement
in Support of Mid-Atlantic DER Initiatives

MADRI Steering Committee
June 13, 2006

Distributed Energy Resources (DER) can provide benefits to electric customers through increased system reliability, mitigation of wholesale energy prices and other wholesale market risks, improved power quality, improved air quality, reduced line losses and avoided wires investments. Many DER options can also provide direct benefits to customers in that they are provided with new tools and means to better manage their electricity usage and bills. Achieving these long term benefits is a valid goal of regulatory policy. DER projects may also stimulate local economic development. DER includes targeted energy efficiency, demand response, and distributed generation technologies.

With a goal of full implementation of commercial DER programs, and within the broad context of laws and regulations that affect DER (including but not limited to economic, environmental, land-use, building codes, safety and security), state utility policy makers and regulators should consider changes to encourage cost effective DER programs including:

- removing market barriers;
- developing appropriate regulatory treatment;
- reducing utility disincentives to accommodating DER
- establishing DER program goals;
- providing DER program incentives; and
- testing solutions at a pilot scale as a step toward full implementation.

State utility policymakers and regulators may consider special studies and pilot programs to evaluate the costs and benefits of DER technologies such as metering and communications infrastructure that enable dynamic retail pricing regimes. These enhancements would allow more customers to see and respond to market prices. Those DER investments that provide a net long-term benefit to distribution system ratepayers should be implemented or encouraged. A portion of such long-term benefits may be used to enhance the economics of installing DER through special tariffs.

In keeping with normal regulatory practice, authorized utility expenses and investments that facilitate DER products and services by any vendor should be treated as other utility costs and afforded cost recovery and an opportunity to earn a reasonable rate of return on investment.

MADRI Action Plan for PUC Consideration

- ✓ A New DER Policy Statement That Reflects Recent Changes in Today's Market Environment

1) Adoption of a 3% DER Goal
2) Development of Specific Benefit/Cost Criteria for Determining Which DER Investments Are Appropriate and Which Are Not
3) Consideration of and Action on Seven Specific Initiatives For Increasing DER in The Mid-Atlantic Region

Actionable DER Options for PUC Consideration

Open a proceeding, possibly as part of an EPACT investigation, to identify at least one DER pilot program or DER initiative to be undertaken by a distribution company in 2006 and to review an overall plan for achieving the 3% DER objective

Actionable DER Options For PUC Consideration
Smart Thermostat Program
CHP Initiative
Pricing Pilots & Models
Internet Platform for Accessing ISO Demand Response Program
Model Decoupling Tariff
Targeted Distribution System Deferral Pilot
Near-Term & Long-Term AMI Initiatives

PHI's – "Blueprint for the Future" (March '07)

Pepco's Proposed Maryland DSM Programs
(Three Year Implementation Period)

Program	Customers	Measures[9]	Peak Demand Reduction (kW)	Annual Energy Reduction (MWh)
Non-residential Programs				
Building Commissioning and O&M	400	122,000	7,200	63,000
HVAC Efficiency	1,800	27,000	3,000	7,200
Prescriptive	2,400	231,000	5,100	38,000
Custom	1,000	614,000	5,400	15,200
Smart Stat	3,500	85,944	27,100	800
Internet DR Platform	100	N/A	10,000	100
Commercial Total	**9,200**	**1,079,944**	**57,800**	**124,300**
Residential Programs				
Home Performance	8,300	8,300	8,000	19,000
HVAC	8,000	8,000	3,300	5,800
Lighting	76,700	460,000	4,800	22,800
Smart Stat	17,500	17,500	17,500	8,300
Residential Total	**110,500**	**493,800**	**33,600**	**55,900**
Total Portfolio	**119,700**	**1,573,744**	**91,400**	**180,200**