



**SEDCC**  
Smart Energy Demand Coalition

# Smart Energy Demand Coalition

**Comments on**

Operational Security Code

**09.04.13**

Jessica Stromback





# SEDC

Smart Energy Demand Coalition

## Executive Members



## Associate Members



# Our Membership



## Smart Energy Demand Coalition

The **SEDC** is an not-for-profit industry group, representing the requirements of programs involving **Smart Energy Demand** in order to support the 2020 objectives, further the development of the Smart Grid and ensure improved end-consumer benefits



**SEDC**  
Smart Energy Demand Coalition

## Operational Security Code

SEDC believes the ENTSO-E Network Codes can create a positive framework within which demand and supply side resources can compete on an equal footing

This will provide balancing resources at the lowest possible cost and increase security of supply

**Due to a lack of clarity within the Code's definitions until late in the drafting process,**

**There has been little direct involvement of the SEDC in this code.**

**Therefore the following presentation includes some clarifying questions as well as concerns.**

## General Comments

- **Overall the code seems to make an effort to be fair to demand side resources**
- **Have three remaining areas of concern/questions:**
  - The definition of aggregation and significant user
  - Assurance that paid Demand Response participation will be protected
  - Assurance that consumers will not be required to participate in Demand Response
  - Assurance that aggregators and consumers are not required to carry unnecessary costs



## Requirements on Significant Grid Users

**Overall the code seems positive and aims to enable Demand Response, We have concerns over the lack of definition around aggregation and treatment of Significant Users.**

We assume Significant Grid Users can also include aggregated pools of many small users

1.Does it mean that Demand Facilities that are connected to the Distribution Network but pooled by an aggregator shall comply with the provisions of this NC (as if they were “Significant Grid Users”)? **Impossible for consumers**

2.Or will aggregated pooled load be treated as a single Significant User and the aggregator be required to fulfill the requirements of the code? **Possible for consumers**

*(this seems to be indicated in Art 1.3 and 29.2 but remains unclear, nor is it clarified in the definition of Significant User)*

## Consumer Protection

### Clarification of Art 10.9

*“A Significant Grid User which is a Demand Facility shall **automatically or manually, disconnect at specified voltages in the specified timeframe**, defined by the TSO or by the DSO if this Demand Facility has Connection Point to the Distribution Network. Each TSO making use of the provision in Article 10(9) shall respect agreements with other TSOs pursuant to [NC OPS] and shall ensure the coordination with involved DSOs.”*



## Consumer Protection

### Clarification of Art 10.9

1. It should be specifically clarified that this NC does prevail over the provisions of the Balancing NC, DCC or LFC&R.
1. All obligations and actions to be performed by Significant Grid Users shall only be as a last resort for TSO (after having used all their possible reserves to restore the system),
1. The SEDC sees a risk that TSOs gain a possibility to ask consumers/aggregators to disconnect from the grid without being paid, instead of having a contract regarding the provisions of reserves.



## Consumer Protection

### Clarification of Art 28.5

- *“Each Demand Facility directly connected to the Transmission System shall communicate to the*
- *TSO in real-time the following information:*
  - a) active and Reactive Power at the Connection Point; and*
  - b) minimum and maximum power to be curtailed.”***

Does this indicate mandatory Demand Response for those Demand Facilities who do not participate in any other DR program

Question, why are ALL demand facilities required to tell what they can curtail - can the answer be 0?

## Consumer Cost Control

### Clarification of Art 29.2

*“The following requirements shall be defined by the TSO in coordination with DSO.*

*Each Significant Grid User which is an Aggregator which participates in Demand Side Response as defined in the [NC DCC], shall communicate to its TSO or via its DSO to the TSO at the **day ahead and within a day at near real-time** on behalf of all of its distribution connected demand sites:*

**What is the definition real time – each second, minute, 15 min.?**

**Does this mean anyone participating in any of the DCC DR programs must have real-time communication? Highly expensive for consumers and for some programs, unnecessary**

*a)Structural minimum and maximum Active Power available for Demand Side Response and the **maximum and minimum duration of any potential activation of Demand Side Response in a specific geographical area** defined by the TSO and DSO;*

**Usually the max and min duration times are defined by the TSO as a condition for participating in the program – unclear the aggregator must communicate this in real-time?**

## Consumer Cost Control

### Clarification of Art 29.2

b)

*forecast of unrestricted Active Power available for and any planned level of Demand Side Response in a specific geographical area defined by the TSO and DSO;*

**How exact is this forecast expected to be? No baseline defined within the codes...**

c) real-time Active and **Reactive** Power; and

**For Active power there is a market and the business case and Aggregators have this data. But not for Reactive power. So, who will pay for Reactive power data? What will happen if Reactive Power is not metered?**

d) confirmation of the estimated **actual values** of Demand Side Response applied.

**What are the “estimated actual values”?**



THANK YOU

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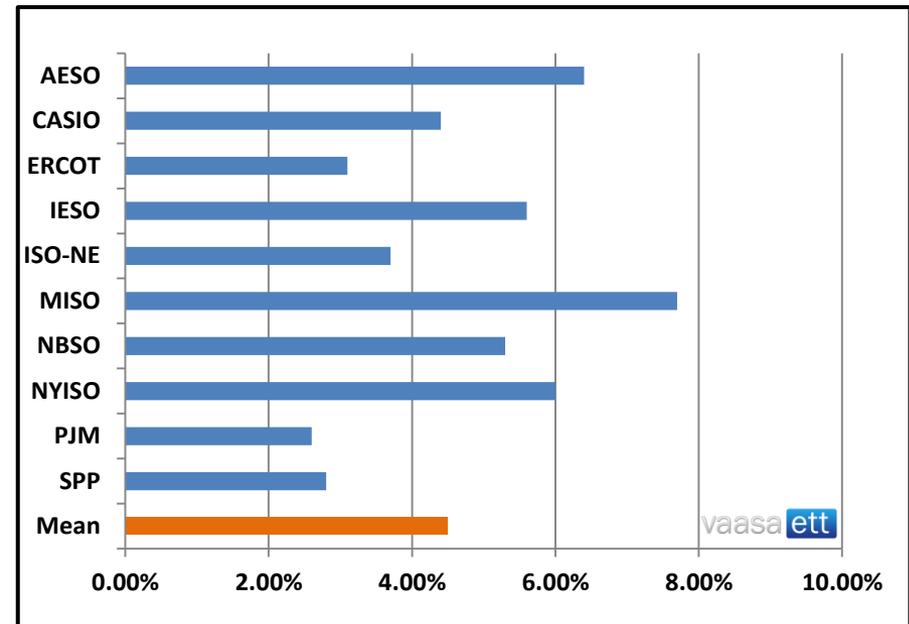
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<http://sedc-coalition.eu/>

## Demand Response = Growing Potential Globally

Why Care? **As of 2012, 29.5 GW of Demand Response**

- **USA Multi Billion \$ Business Direct Revenue + avoided investments Generation, T&D**
- Demand Response “took off” in 2005 with Demand Side access to capacity markets
- Average estimate peak clipping 8-11% US
- Average estimate possible peak clipping 6-13% Europe
- Developing nations looking at DR for peak clipping purposes. India, Brazil, China etc.

**A total of 66 GW were under some form of control, making up 9% of total US national capacity**



**Actual Peak Clipping USA 2010  
C&I + Residential Demand Response.**  
Source: FERC

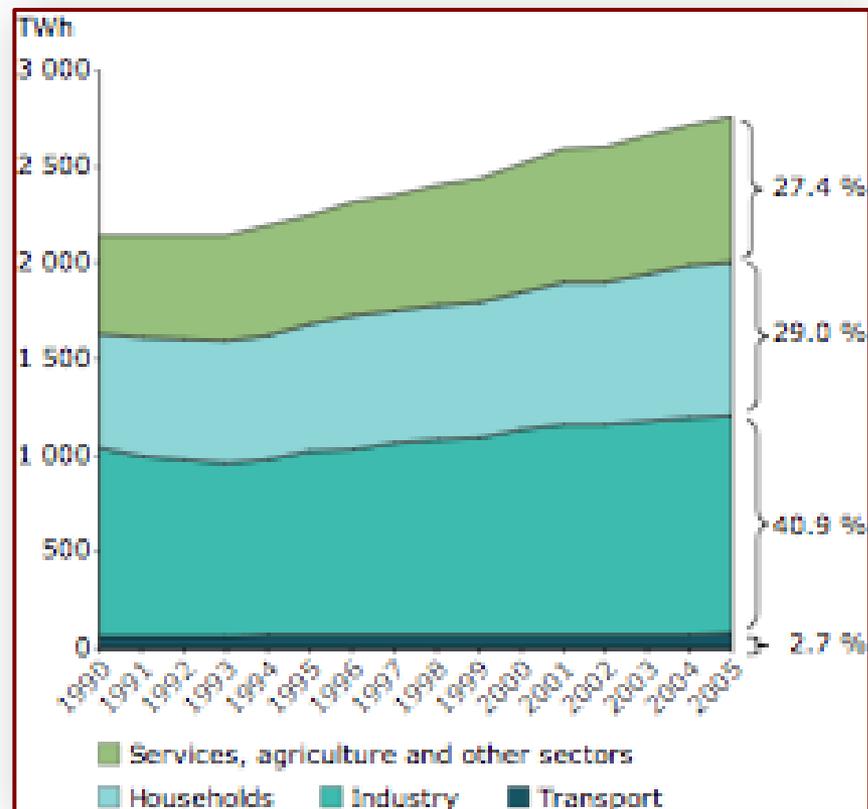
# Commercial Industrial Demand Response

## “the low hanging fruit”

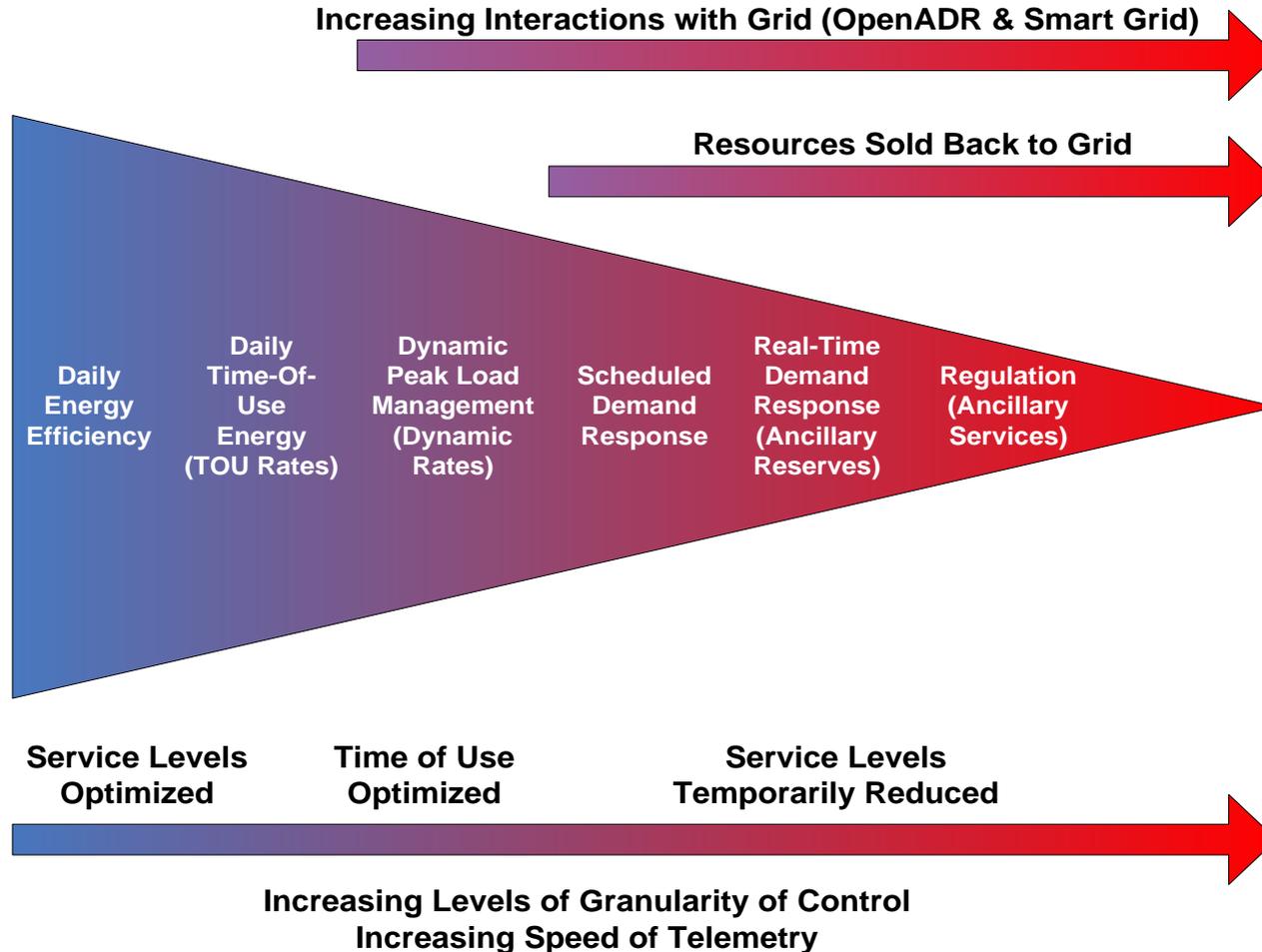
- 2700 TWh Consumption EU
  - 41% Industrial
  - 27% Commercial
  - 30% Residential
- 
- Aggregator experiences such as Entelios

Germany are showing that EU Industries can and are willing to shift

Between: **20-50% of their load**



**State of the Art Integrated, Automated Demand Response for Control Centers**



**Demand can participate:**

- 2 second, 30 second, 2 min 1 hour, intra-day...



# Demand Response Back Office

## Identify



Operators see need for event

## Notify



Event calls are made to customers

## Curtail



Customers change their consumption

## Monitor

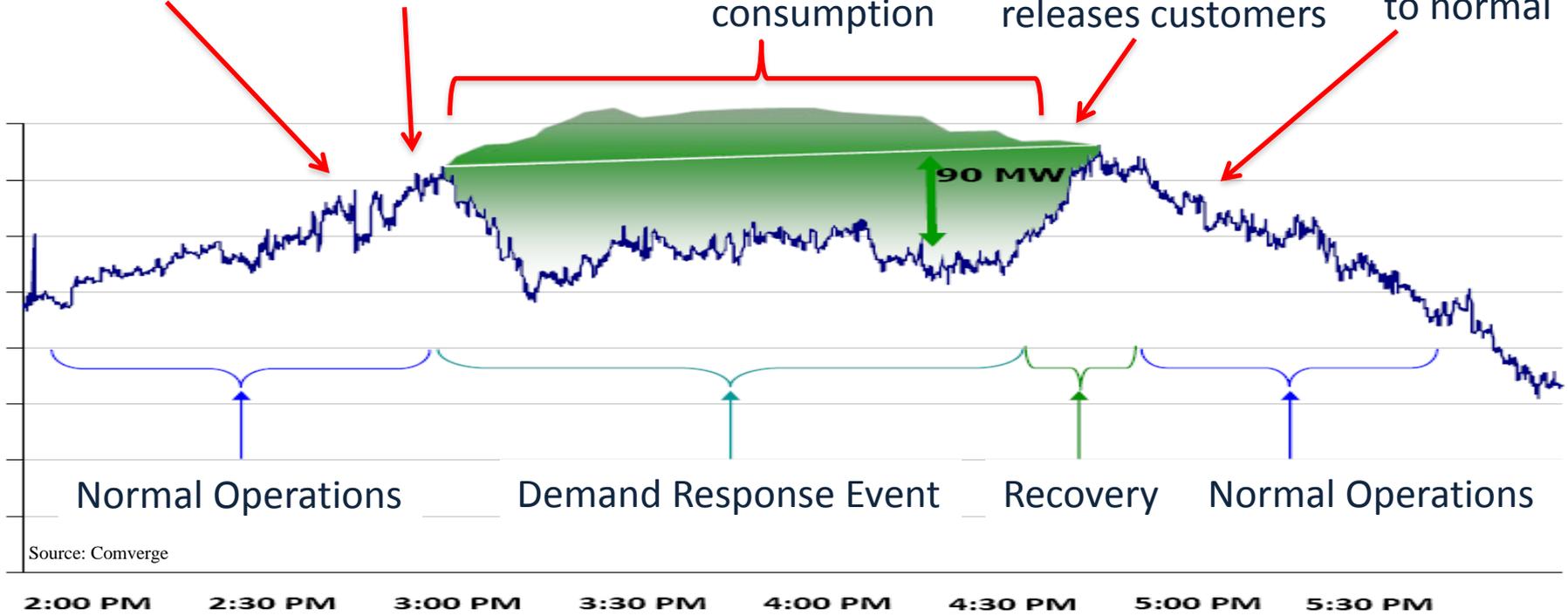


Operators monitor response, then releases customers

## Restore



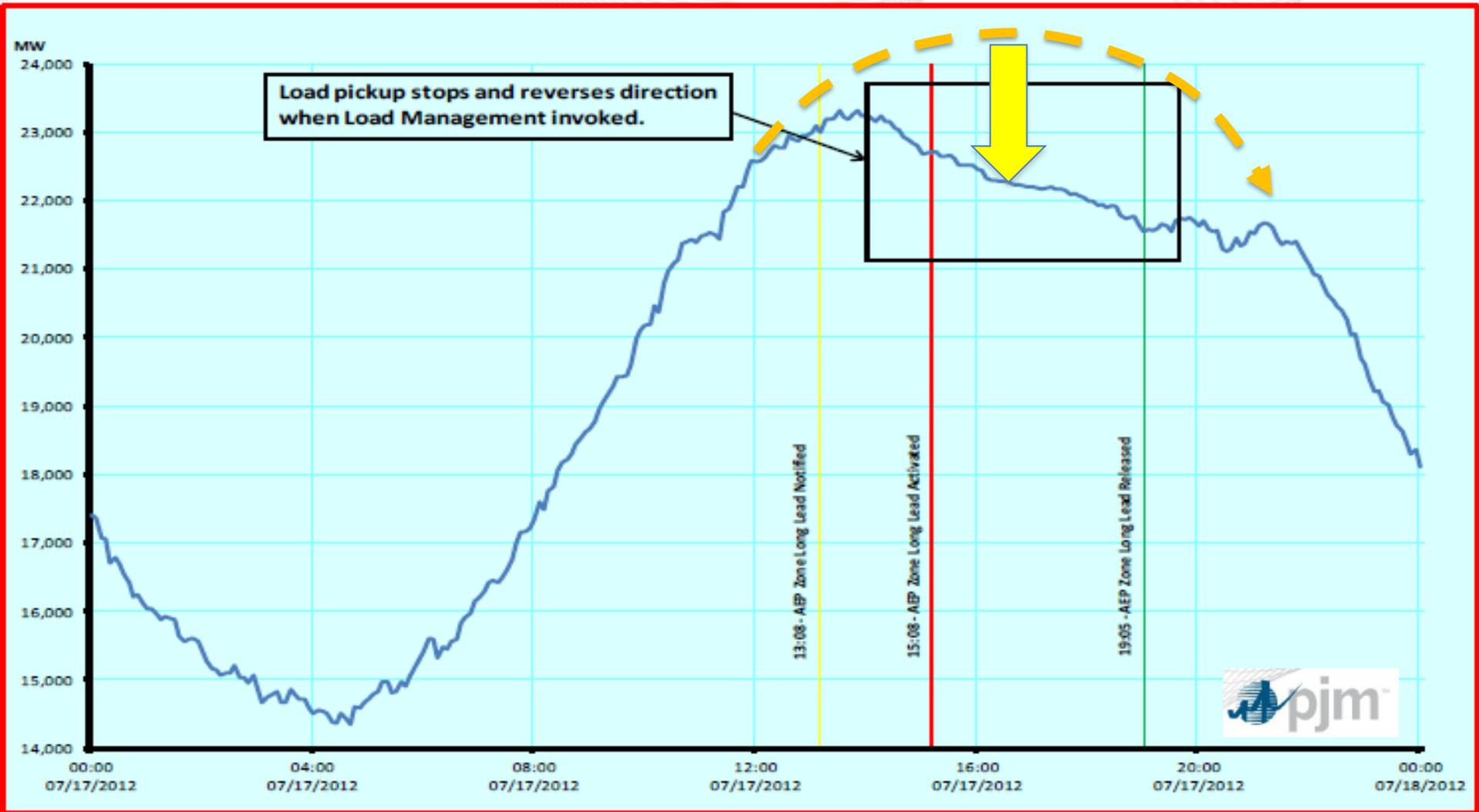
Customer load returns to normal



Source: Comverge

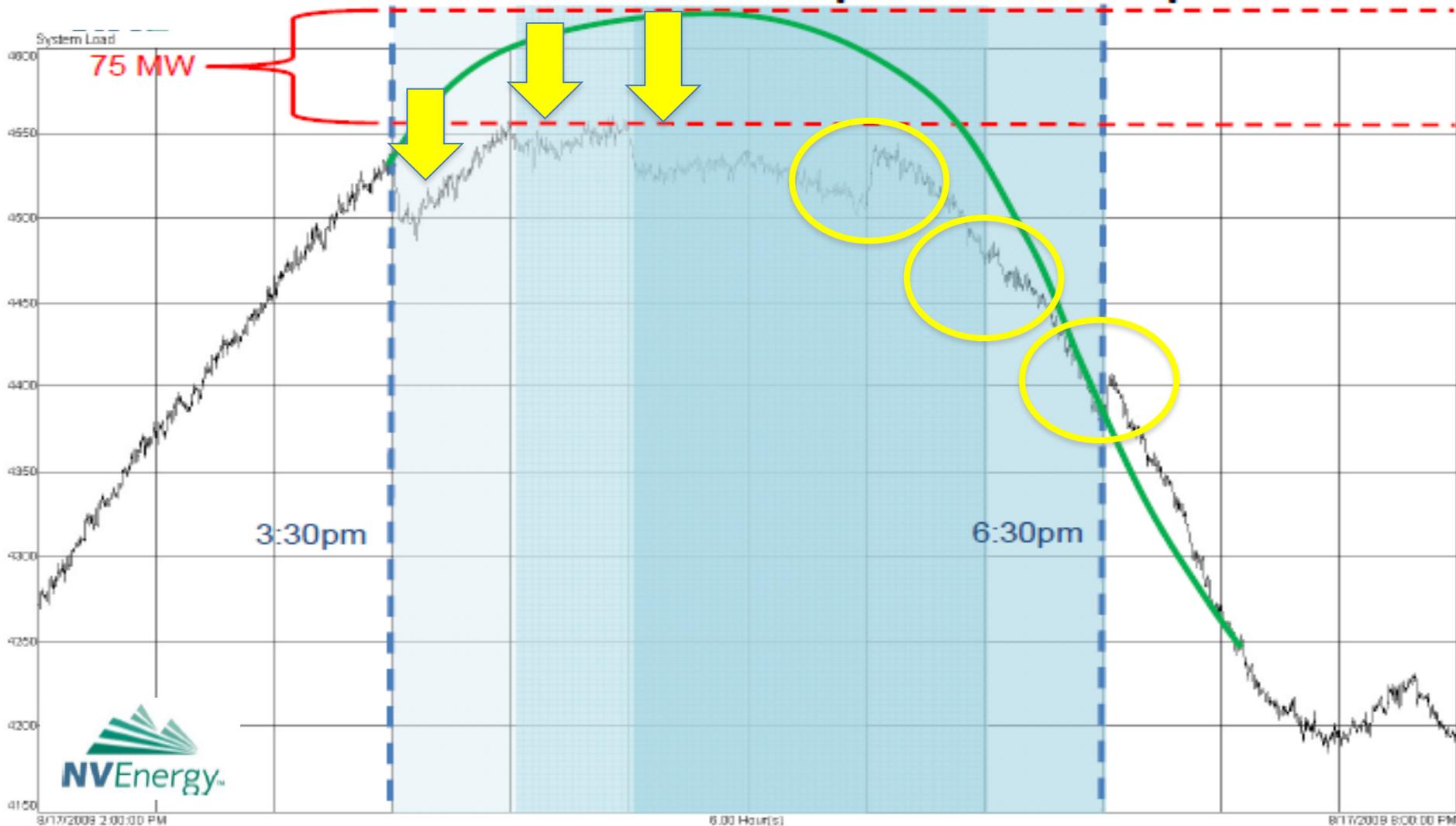
# Emergency Capacity called by operators

7/17/2012: Another 1500MW helps avoid more serious problems



# Energy Economic Energy Dispatch

8/17/2009: Via phasing, 75MW of expensive generation avoided



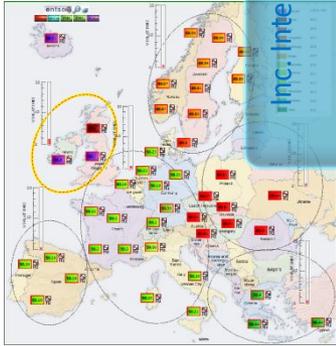
# Next Generation Market Place

**Internal Congestions**  
More and more complex operational issues to solve on the Grid (AC/DC)

Need to Explicitly take into account models / physics in electricity markets



**Inc. Interconnections**  
More and more need for collaboration



Need Regional coordination for both System and Market operation

**Stochastic Power**  
More and more uncertainties

Need to get Closer to real-time market operation  
Importance of look-ahead



**Lack in Capacity**  
Need to provide incentives to cover investments

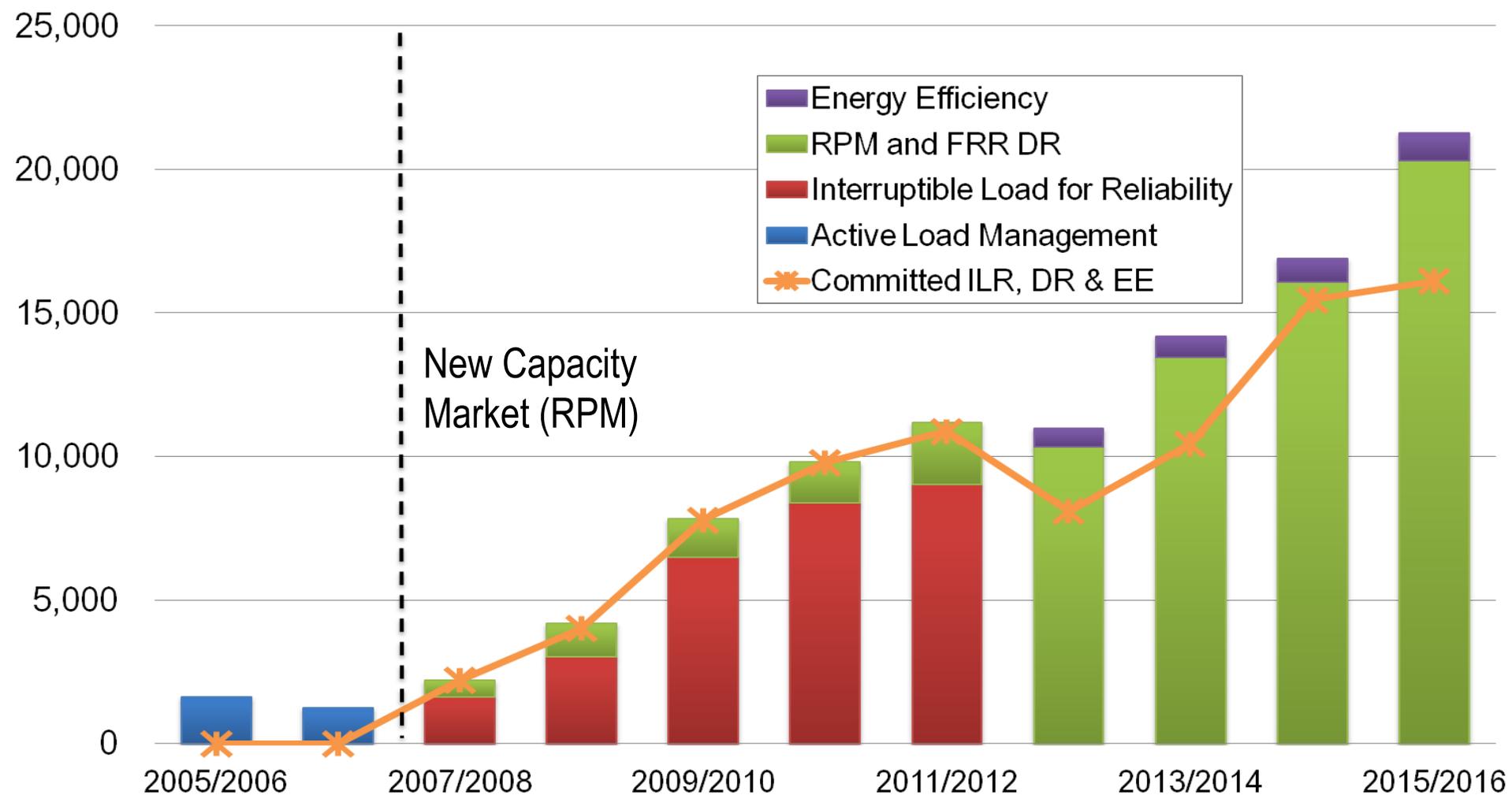


Importance of regulation  
New products (DR, flexibility)  
Capacity markets



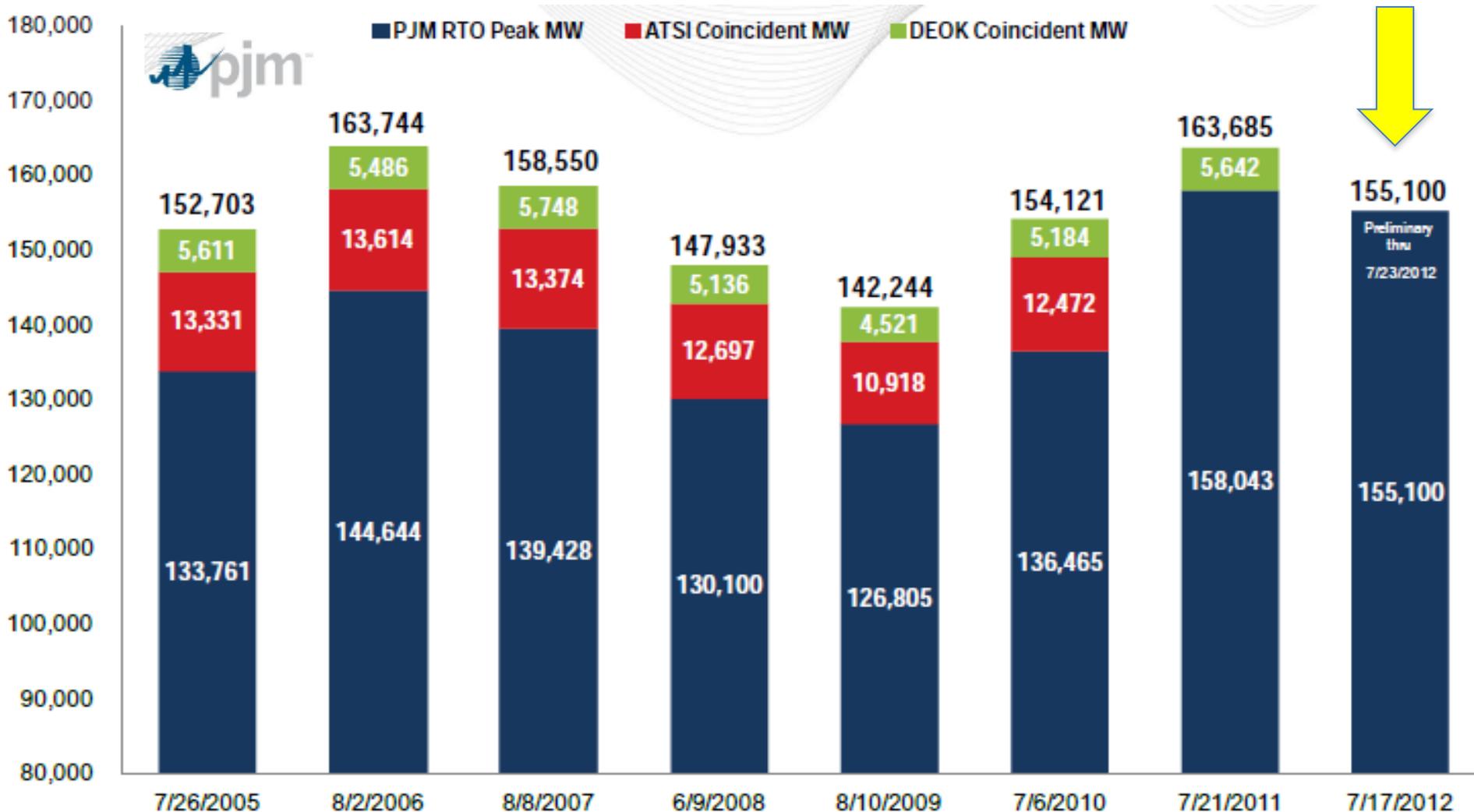
# PJM has over 15GW of Demand Response

## 35% CAGR since new DR capacity market opened in 2007



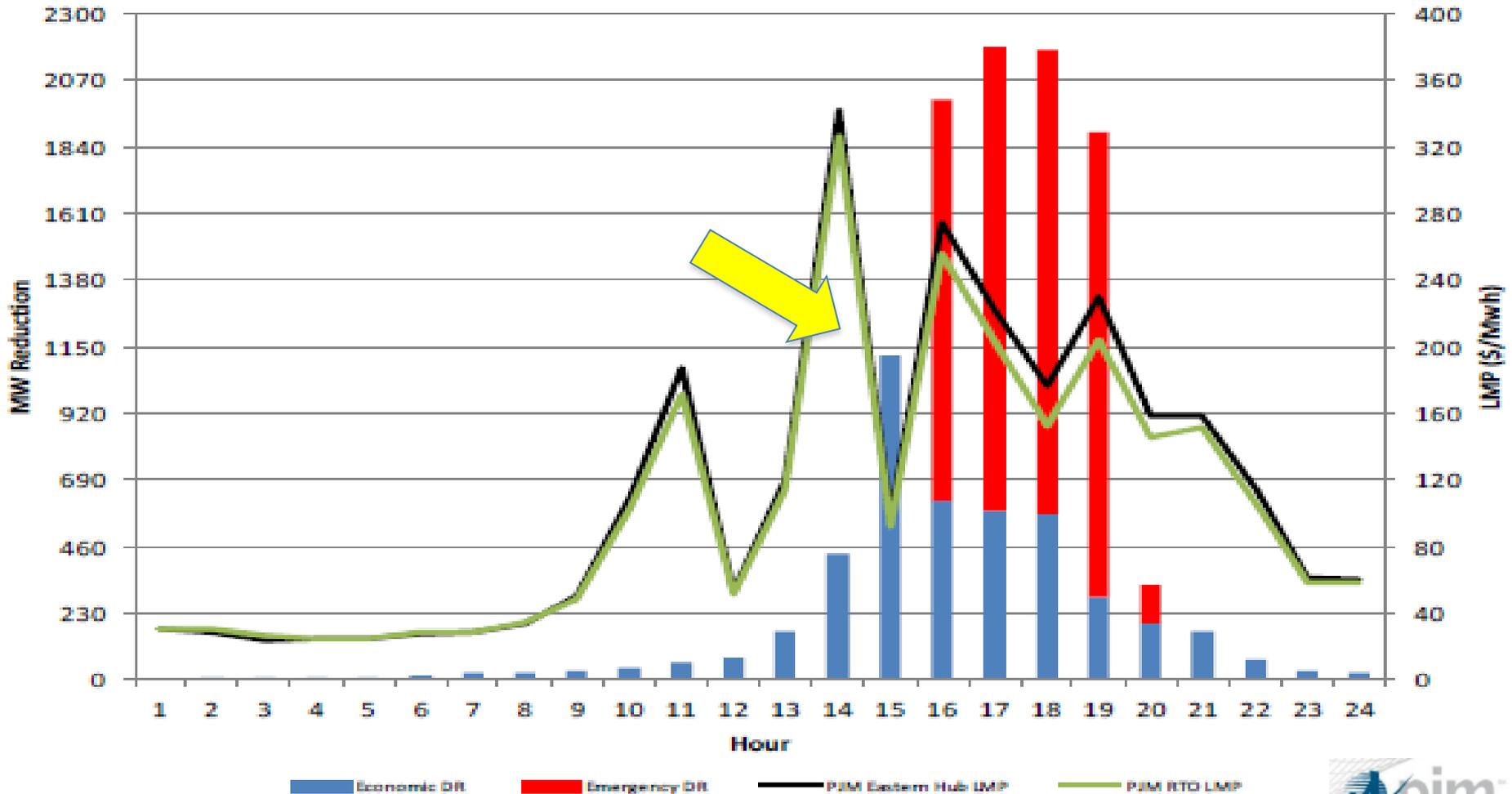
# PJM used DR in a recent heat wave

7/17/2012: Historic peak load of 155GW, with 6GW of gen offline



# PJM Economic Energy was dispatched first

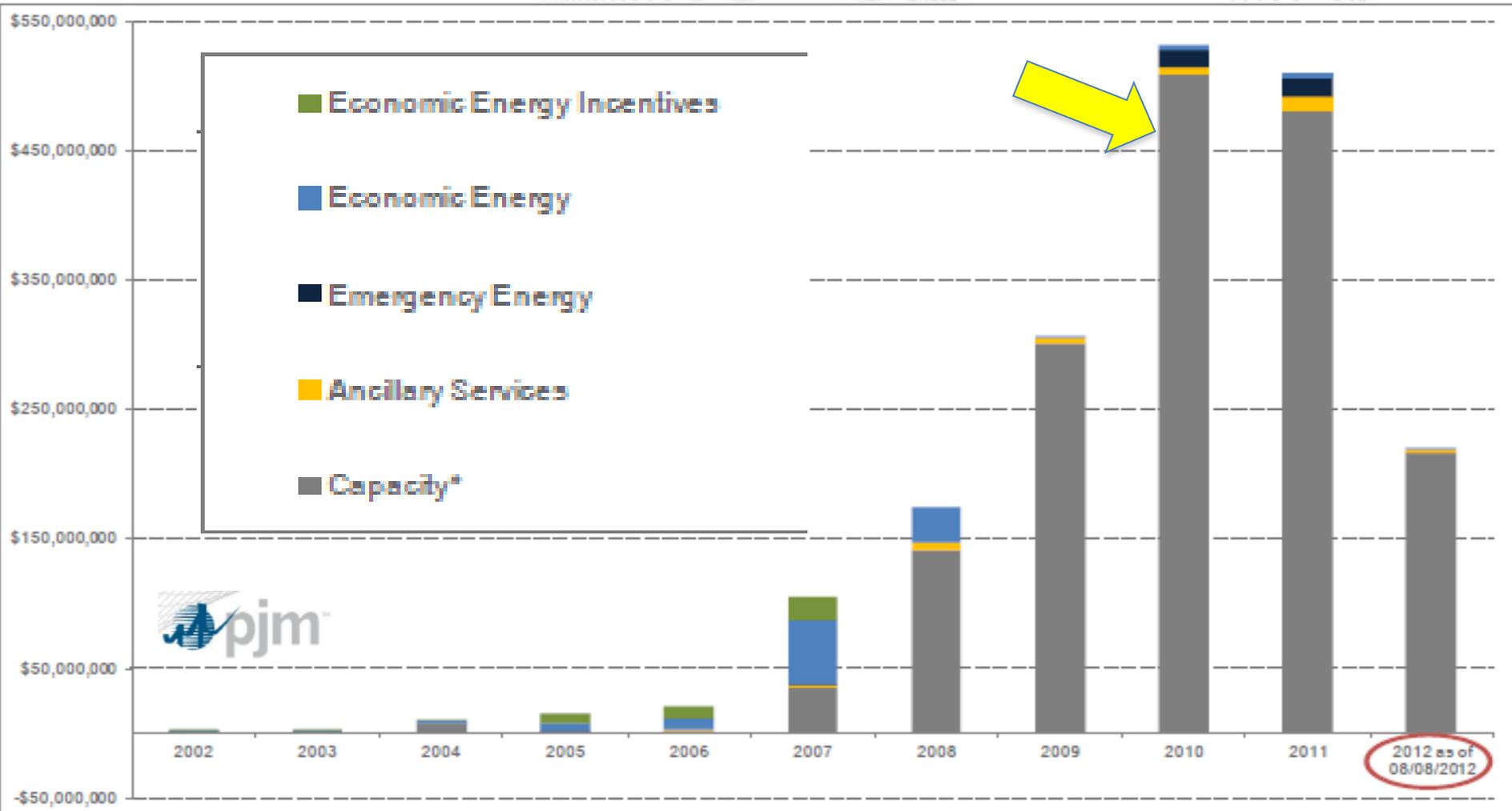
7/17/2012: 1000MW of economic DR helps suppress LMPs



Registered Emergency DR Amounts adjusted for RPM Commitments.  
Note: Actual load reductions are not finalized until up to 3 months after event.

# PJM Demand Response is a \$500M market

Capacity payments represent the vast majority of DR revenues



\*Capacity Net Revenue inclusive of Capacity Credits and Charges.

**NVEnergy has +185MW of DR  
with 250MW more in deployment**

Distributed Energy Resources Portfolio

**Cool Share 2.0**

Residential/Small Commercial

- Deploy Advanced Home Area Network (HAN) on top of Advanced Meter Infrastructure
- 148 MW & 60k Customer Target

**NDPT**

Residential/Small Commercial

- Pilot advanced rates across various treatments
- Meet ARRA Compliance (1-3 MW & 9k Customers)

**Cool Share 1.0**

Residential/Small Commercial

- Programmable Communicating Thermostats (Paging)
- 152 MW & 60k Customers Achieved

**IS-2**

- Emergency DR / Irrigation Pump Control
- 35 MW under control

**Distributed Energy  
Storage**

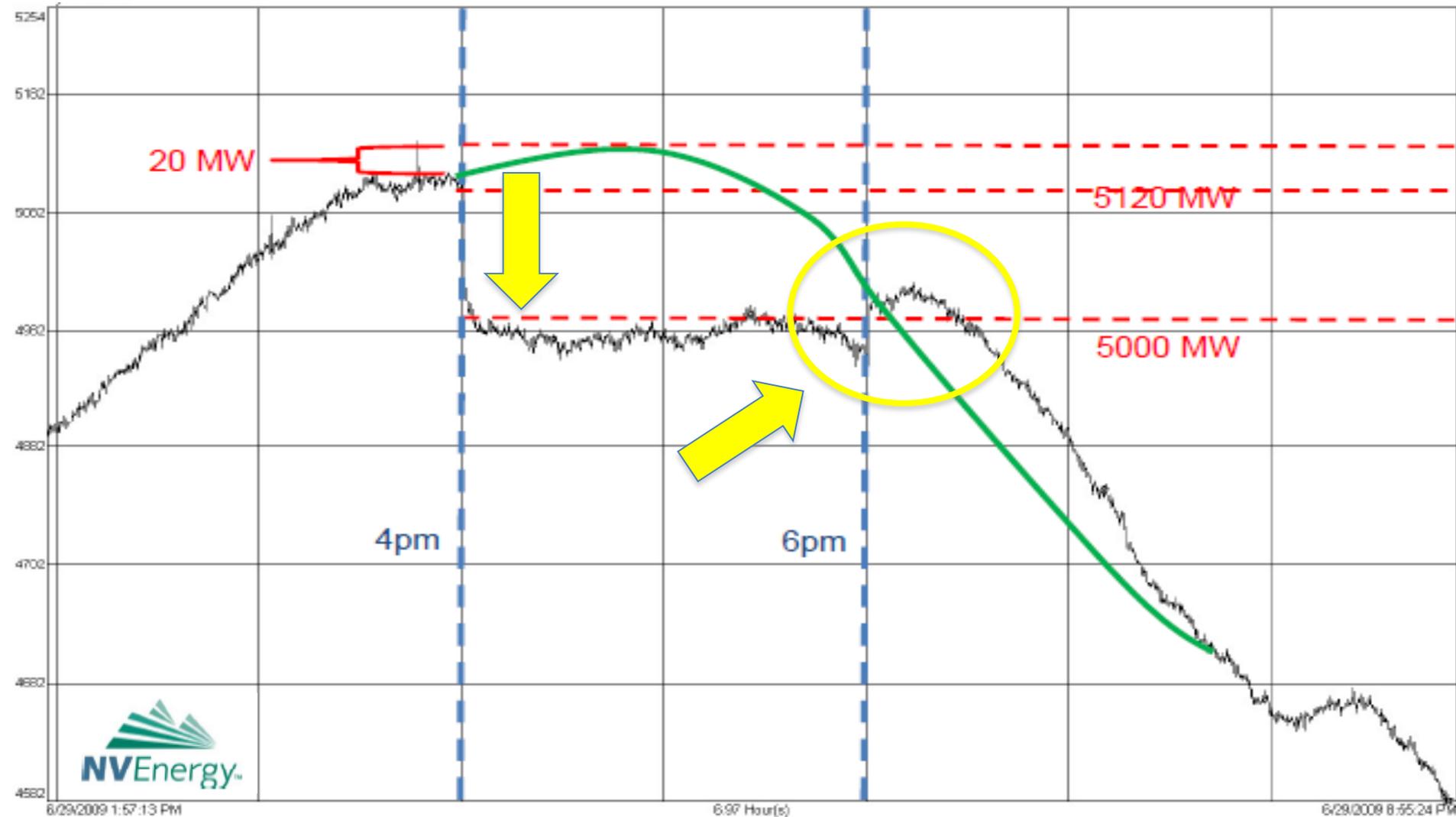
- Community Energy Storage – Batteries embedded in Distribution Network (Villa Trieste Pilot)
- Develop Optimization Algorithms / Business Case

**Commercial &  
Industrial DR**

- Integrated Energy Efficiency & Demand Response
- 100 MW Target???

# NVEnergy Emergency Energy Dispatch

6/29/2009: 5 minute drop of +120MW, sustained for 2 hours



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