



Demand Side Participation in the ISEM

22nd October, 2014

EnerNOC



24–27GW of Peak Load under management

~9GW of Dispatchable Demand Response (DR)

11 Countries with DR operations

100+ Utilities / System Operator relationships

14,000+ C&I Facilities in our network

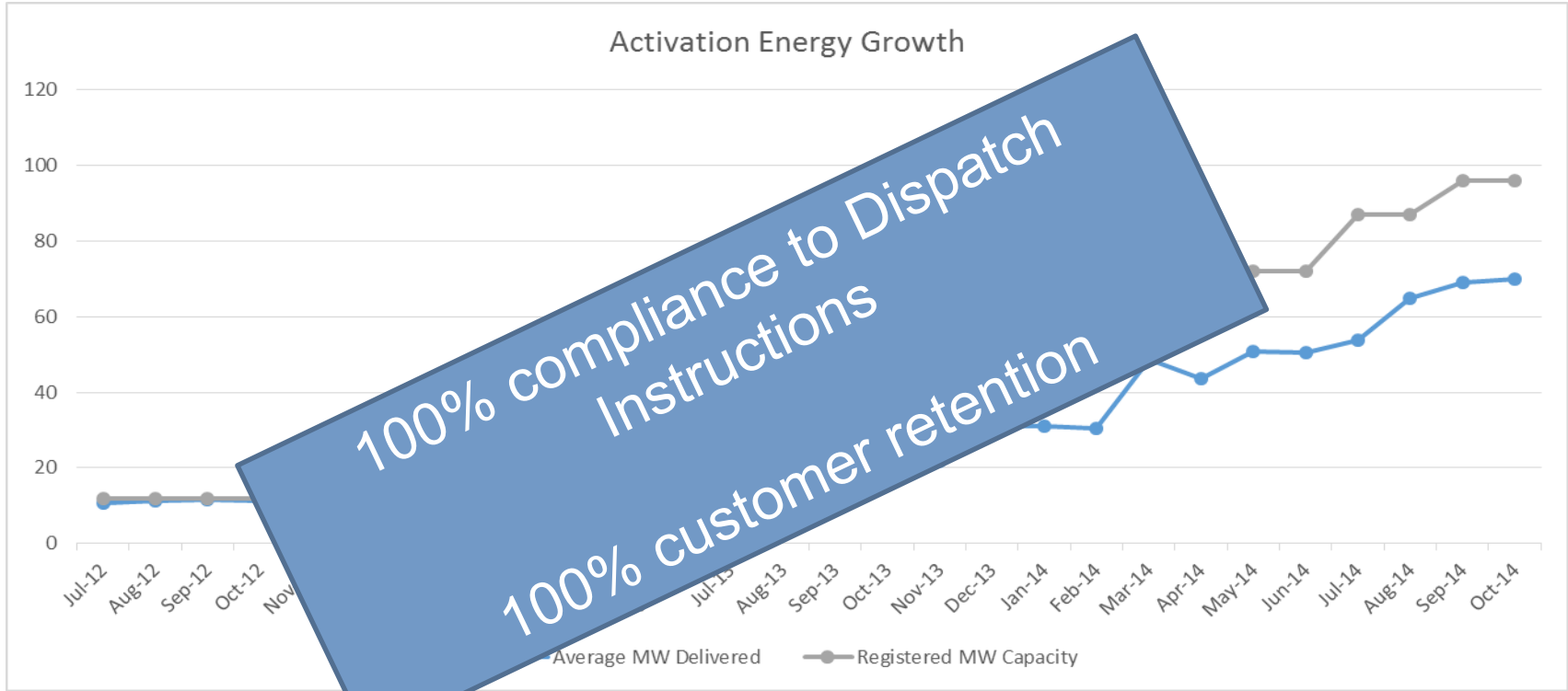
~1.5 Billion Data Points / Month into our NOC

~1,000 Employees worldwide

DR in Ireland

- Paid Capacity Payments from the SEM
- DR treated in the same way as generators
- 30 minutes response
- 2 hours demand reduction
- Live signal sent to TSO similar to generators
- Demand response from load reduction or switch over to back up generation

Activation Energy



Our Vision

- Ireland as a leader in the Demand Response Space

Lots of Wind to be integrated

Island with little interconnection

Small number of energy stakeholders

Knowledgeable community

Large ICT sector

Need to

Avoids building more infrastructure

Demand Side Units are NOT Traditional Generators

DR in Global Capacity Markets

Given market access, DR has proven to be an important resource in capacity markets

Market	DR capacity	% of total
PJM	14,118 MW	8.6%
NYISO	2,248 MW	6.7%
ISO-NE	2,164 MW	7.4%
WEM	499 MW	8.2%



\$11.8 Billion Saved
2013/14 BRA: Impact of DSM

PJM Market Monitor. Analysis of the 2013/2014 RPM Base Residual Auction Revised and Updated, September 2010

PJM 2014/15 Base Residual Auction Results, Doc #645284, page 9. 14,118.4 MW of DR Cleared in the RPM.

PJM 2014/15 RPM Base Residual Auction Parameters, Doc #631095, pg 2. Forecasted peak of 164,758 MW

NYISO's Demand Response Programs. Donna Pratt, Manager Demand Response Products. May 2011.

NYISO Press Release, 22 July 2011. Peak demand reached 33,454 MW on 21 July 2011.

Forward Capacity Auction 5 (FCA5, 2014-15) Results Summary, ISO New England, 2011.

ISO Installed Capacity Requirements, PAC Meeting. ISO New England, July 2011. Compares cleared FCA5 MW to the CELT 2011 Forecast 50/50 Peak of 29,380 MW for 2015 Year.

WA: Summary of Capacity Credits for the 2011 Reserve Capacity Cycle (October 2012-2013), IMO, Sep 2011

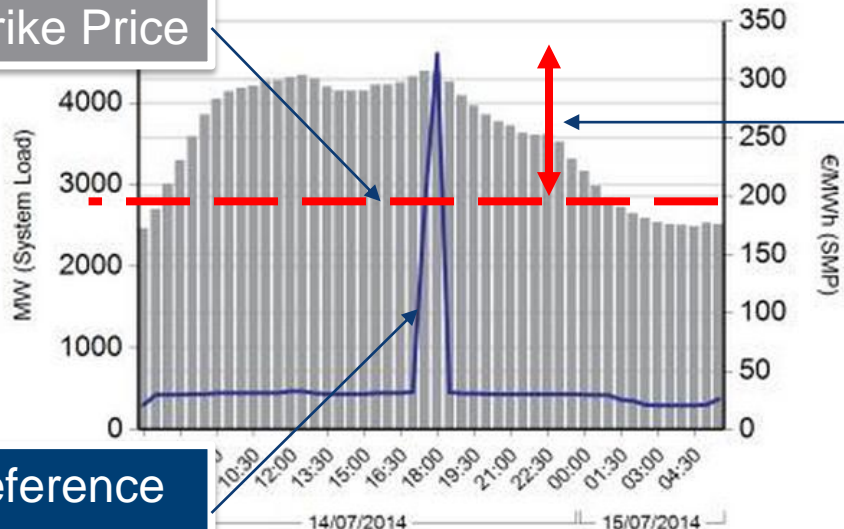
WA: Ibid. Compares cleared DSM capacity to the Reserve Capacity Requirement of 5,312 MW.

The Single Electricity Market Overview 14th July 2014

Ex-Ante 2 14th Jul ▼

■ SYSTEM LOAD — SMP

Strike Price



Reference Price

th July 2014

[View Chart Data](#)

Currency:

Option to be paid

Trading Day Statistics

Min Daily Price:

€20.56 MWh

Max Daily Price:

€321.83 MWh

[More Market Data](#)

Today's Operational Indicators



Pricing



Settlement



Invoicing



Funds Transfer

Open Market Messages

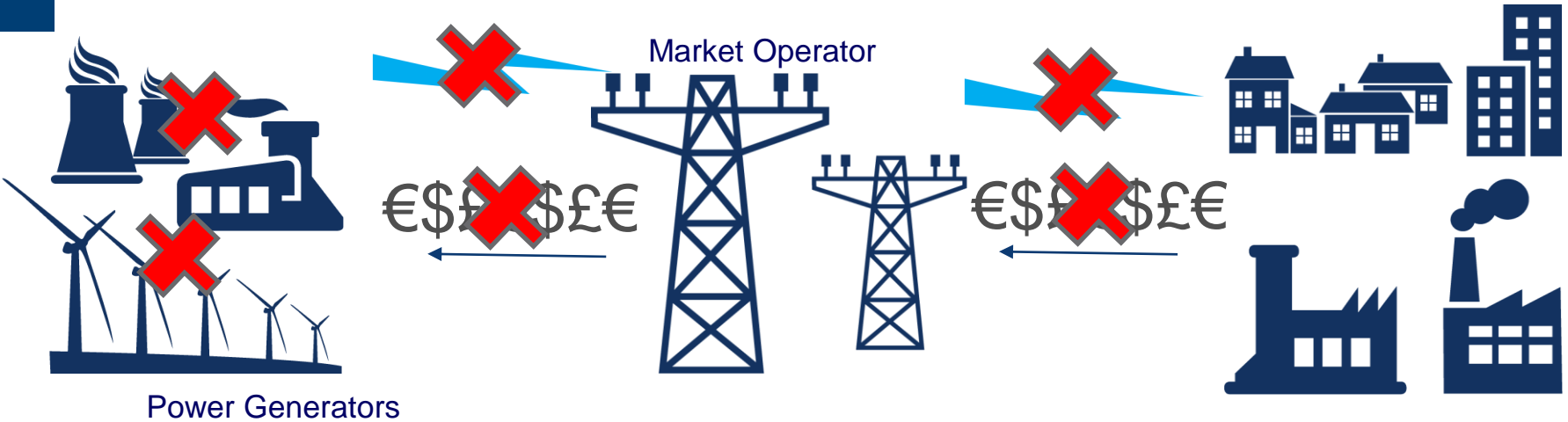
There are currently no open market messages

[View all Market Messages](#)

Value of Market

	YTD
Energy	€1,619,612,868
Capacity	€440,400,969
Constraints	€150,548,860

SEM – Next MW provided by DSU



DSU doesn't get paid an Energy Payment

Reliability Option - Generator Vs DSU

- A penalty for providing Capacity

Generator

Gets Paid an Energy Payment at the Reference Price

Can use this Payment to fund the reliability options
Bid likely to be lower the Strike Price

Should be running when the Reference Price goes above the Strike Price

DSU

Doesn't get paid an Energy Payment at the Reference Price

Has no way to fund the reliability options
Bid may be higher the Strike Price

May not be running when the Reference Price goes above the Strike Price

Proposed Solution

DSU not liable for the reliability option when available (but still takes part in the auction)

- net zero position
- penalty construct for not performing when dispatched in scarcity conditions

Note on Quantity based Capacity Provision

- Capacity at different times of the day is not equal

If DSUs are required to provide 100% of capacity at all times then it would be a problem

- DR capacity generally mirrors the system demand curve
- Effectively requires 200MW of peak time capacity to cover 100 MW of night time capacity obligation

GB have set delivery requirement as profiled vs system demand

- Provide 100% at peak system demand
- Other times delivery requirement is proportional to system demand

Risk of facilitating DSUs

Mass “Economic Demand Reduction”

- Completely unmanaged
- Massive challenges to the system

Thank You



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