Solar Focus 2013

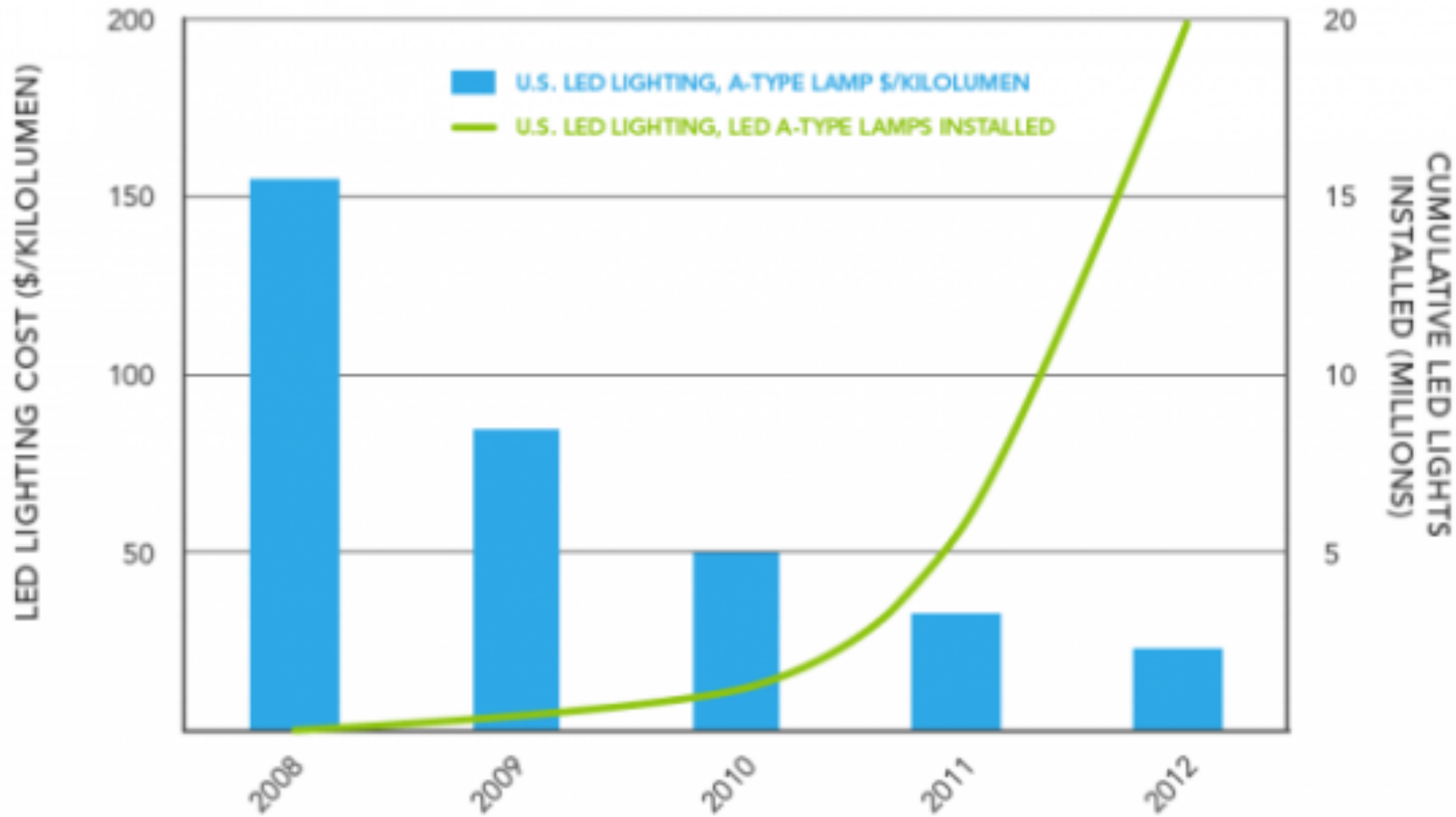
"Planning for the Future of Solar in the East"

Washington, DC
November 11, 2013

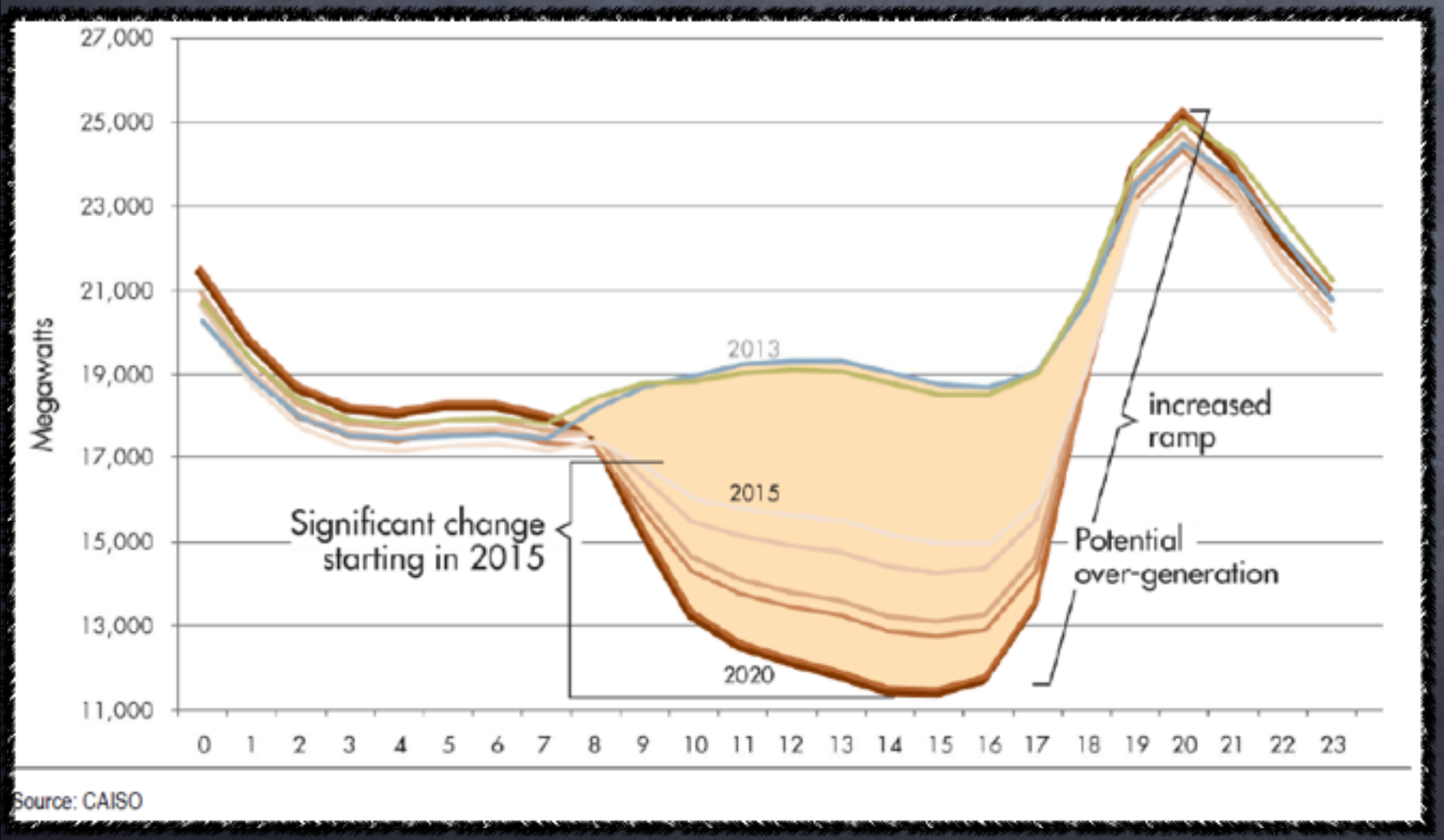
Aftermath of Hurricane Sandy

Rapid Expansion of Distributed Generation

Success Brings Challenges



California's Duck Curve: CAISO Projected Net Load, 2013-2020

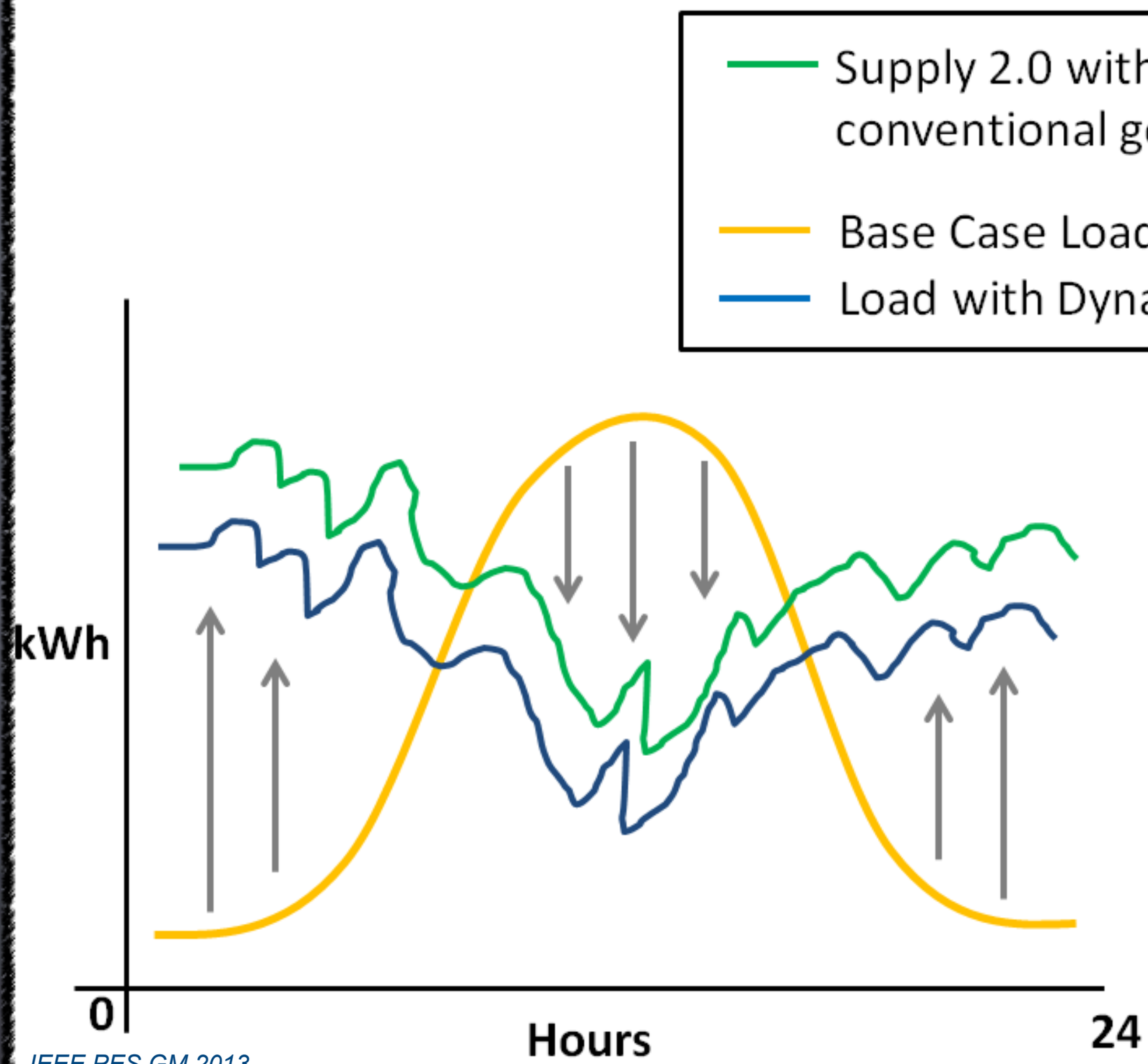


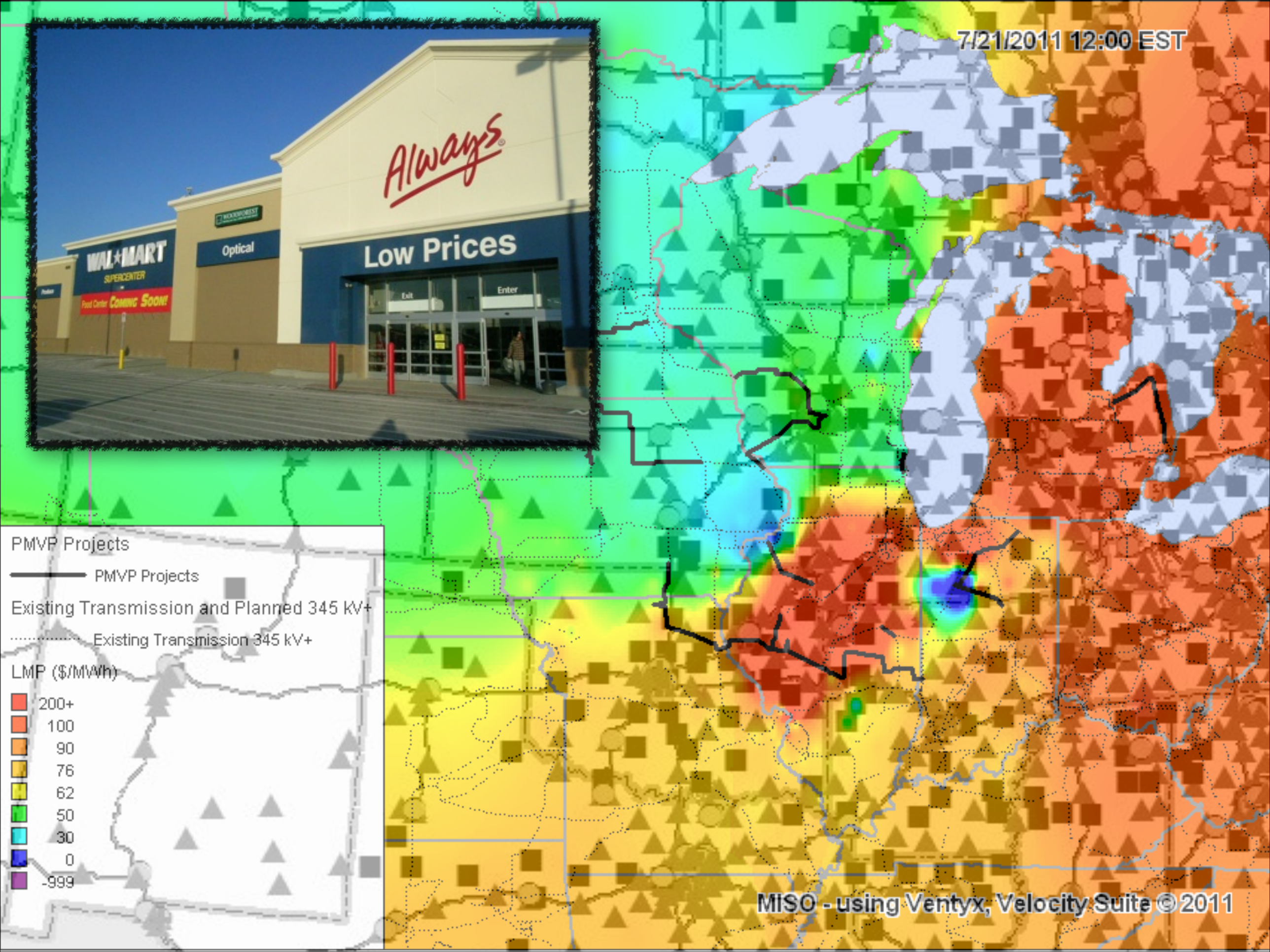
* Variability of wind/solar increase risk of overgeneration

* Overgeneration primarily concern during large/steep ramps

Source: Dumoulin-Smith, Julien. Not All Capacity is Created Equal. UBS Investment Research. June 19, 2013

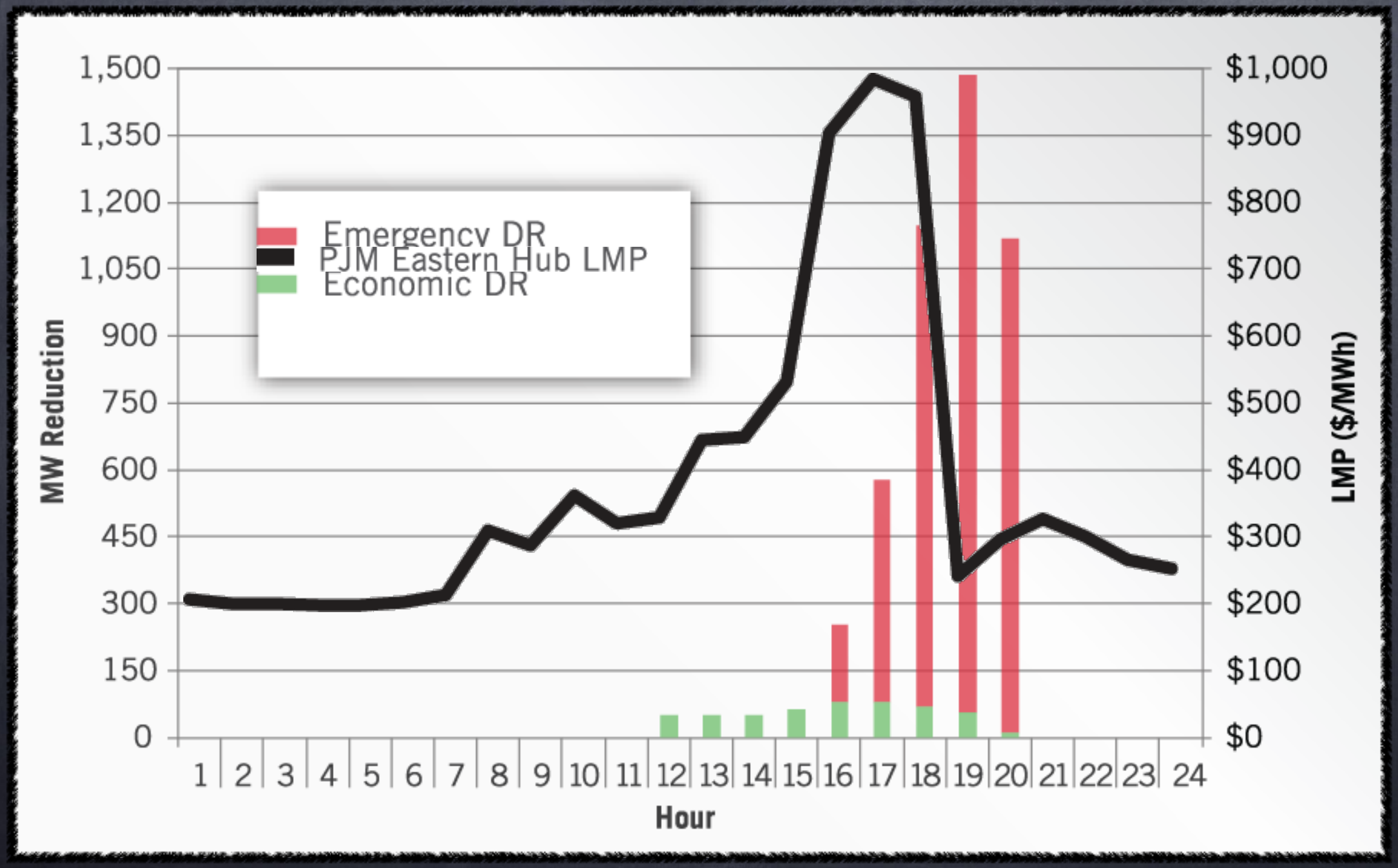
Dynamic Pricing: Integrating Renewables by Creating Around-the-clock Flexibility in Load




7/21/2011 12:00 EST
Always
Low Prices
Optical
WAL★MART
SUPERCENTER
Food Center COMING SOON!
Exit
Enter
PMVP Projects
PMVP Projects
Existing Transmission and Planned 345 kV+
Existing Transmission 345 kV+
LMP ($/MWh)
200+
100
90
76
62
50
30
0
-999
MISO - using Ventyx, Velocity Suite © 2011

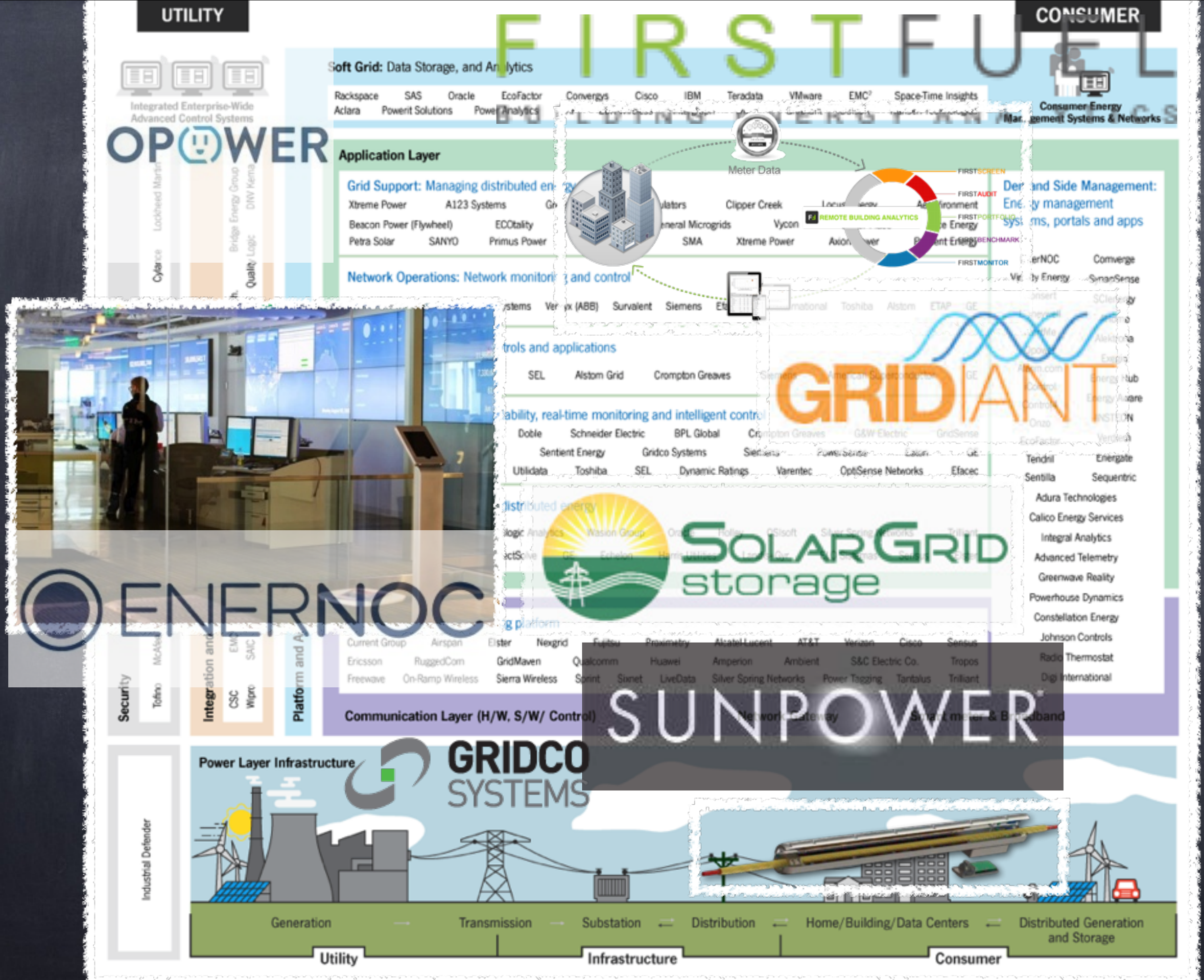
OTTAWA
Champlain
Calais
Bangor
SolarGrid
storage
GridSAS

DR in PJM on May 31, 2011



FERC: The Benefits of Demand Response:

* Lower demand/lower price
* Flatten load profile reducing costly generation
* Reduces generator market power
* Enhanced reliability
* Supports renewable power
* Reduces emissions & generator maintenance


UTILITY
CONSUMER
FIRSTFUEL
Integrated Enterprise-Wide Advanced Control Systems
OPOWER
Soft Grid: Data Storage, and Analytics
Rackspace SAS Oracle EcoFactor Convergys Cisco IBM Teradata VMware EMC² Space-Time Insights
Aclara Powerit Solutions Power Analytics
Consumer Energy Management Systems & Networks
Application Layer
Meter Data
Grid Support: Managing distributed energy
Xtreme Power A123 Systems Clipper Creek
Beacon Power (Flywheel) ECOtality Vycon
Petra Solar SANYO Primus Power SMA Xtreme Power
REMOTE BUILDING ANALYTICS
FIRSTSCREEN
FIRSTAUDIT
FIRSTPORTFOLIO
FIRSTBENCHMARK
FIRSTMONITOR
Demand Side Management: Energy management systems, portals and apps
Network Operations: Network monitoring and control
Survalent Siemens
Toshiba Alstom ETAP GE
Controls and applications
SEL Alstom Grid Crompton Greaves
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Doble Schneider Electric BPL Global
Sentient Energy Gridco Systems
Utilidata Toshiba SEL Dynamic Ratings Varentec OptiSense Networks Efacec
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Integral Analytics
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Greenwave Reality
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Johnson Controls
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Digi International
SOLARGRID storage
ENERNOC
Current Group Airspan Elster Nexgrid Fujitsu Proximetry Alcatel-Lucent AT&T Verizon Cisco Sensus
Ericsson RuggedCom GridMaven Qualcomm Huawei Amperion Ambient S&C Electric Co. Tropos
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Communication Layer (H/W, S/W/ Control)
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Distribution
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Distributed Generation and Storage
Utility
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Consumer

Thank You!