

Plenary Session: Electricity Markets and Regulation

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Current Worldwide Trends in Electricity Markets and Regulation

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Trend # 1 – Local, Piecemeal Approach to Global Warming

- What we know (facts):
 - Global warming is real; average temperatures are rising
 - Global warming is primarily caused by human activity (emission of greenhouse gases)
- What we still don't know (*uncertainties*):
 - The future dynamics of the temperature (with respect to the concentration of gases)
 - The exact impact of the temperature rise on the ecosystems, economics and social aspects

Trend # 1 – Piecemeal Approach to Global Warming

- The potential downside is enormous! However,
 - It is uncertain;
 - It will affect different countries in different ways;
 - Consequences are not aligned with pollution activity
- This is a classical problem of public goods
- The preferred solutions by economists – taxation and/or carbon markets – seem unlikely to flourish
 - There are too many conflicting interests to reach necessary consensus

Trend # 1 – Piecemeal Approach to Global Warming

- What is left – a piecemeal approach, with specific regulation and governmental actions aimed at the energy sector
 - Local, Regional regulation
 - Incentives to renewables
 - Funds to Research & Development, Innovation
 - Pollution regulation (EPA)

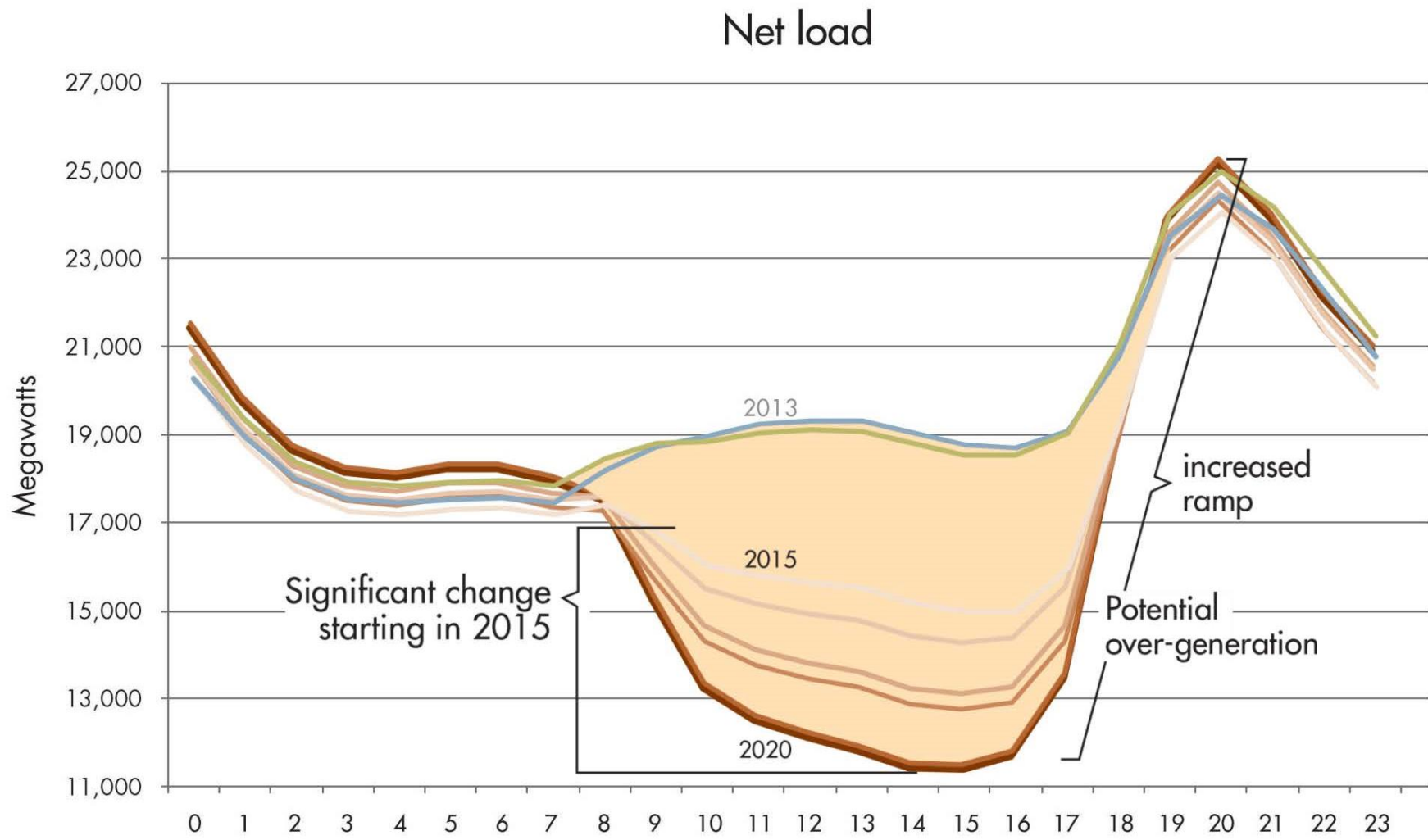
Trend # 2 – Revision of Policies used to promote Renewables

- Most used mechanisms:
 - Feed-in Tariffs
 - Production Tax Credits
 - Renewable Portfolio Standards
- Problems with these instruments:
 - Costs for taxpayers / rate payers
 - Impact on merit order (efficiency)
- Some generators are increasingly more vocal about these issues
 - There is a superior method to promote renewables – competitive auctions for contracts

Trend # 3 – Reward for “Flexible Generation”

- As renewables increase their penetration, it is necessary to have more “flexible generation” to compensate its intermittency
- How to pay for this special kind of generation?
- Most likely, we will see the creation of new markets, for dispatchable technologies

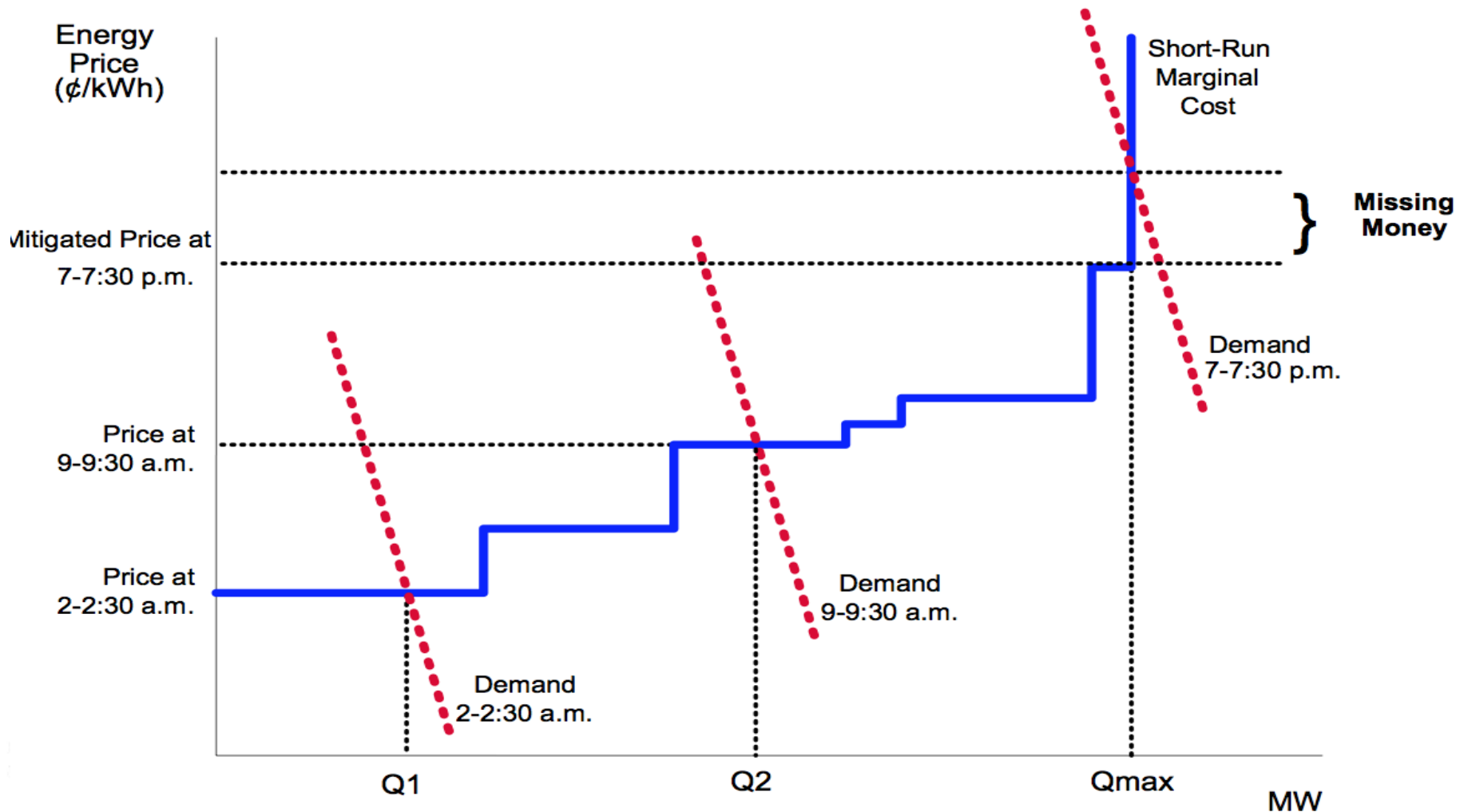
CAISO – The Duck Graph



Trend # 4 – Expansion/ Creation of Capacity Markets

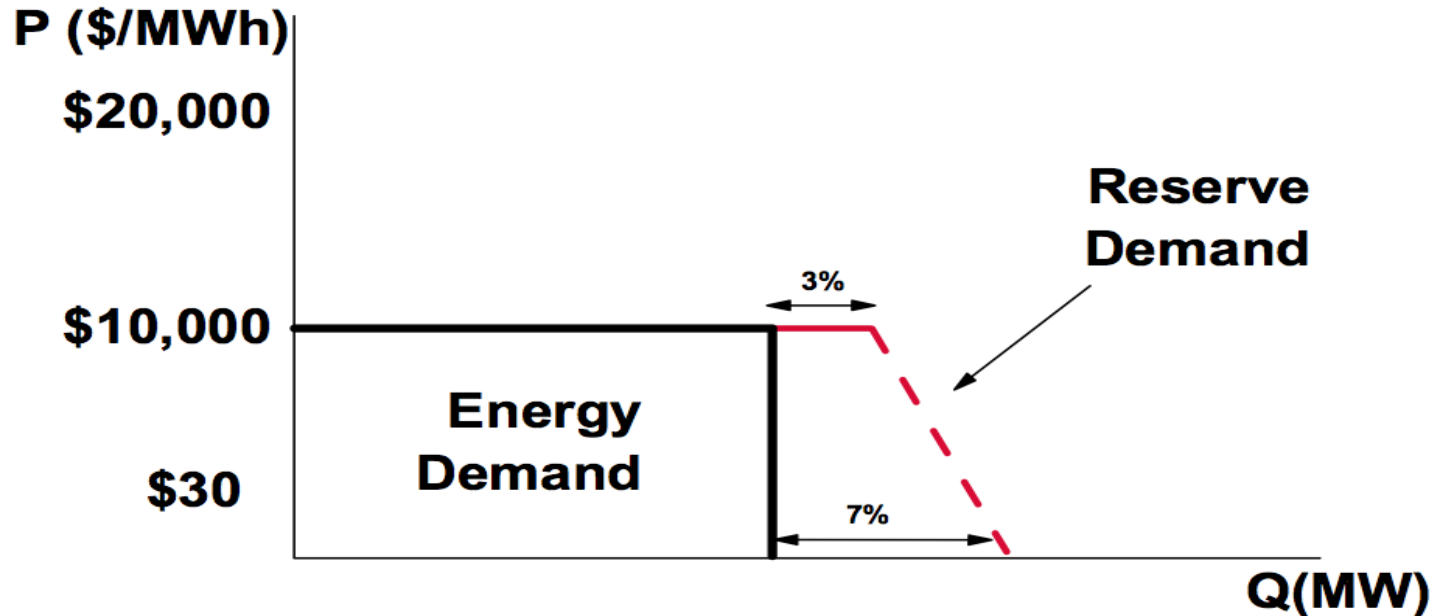
- Energy-only markets have worked in some places (Texas, Australia, Ontario,...) for some time
- However, we are seeing a movement towards the creation of capacity markets. Why?
- The problem of energy-only markets is its cycle of feast and famine
- No problem if we are in feast (excess of capacity production), but when we are in famine...

Energy-only markets need an “expansion” of demand to work



Source: Hogan (2013): “Electricity Scarcity Pricing with an Operating Reserve Demand Curve”

Illustrative Reserve Demand



There is a minimum level of operating reserve (e.g., 3%) to protect against system-wide failure. Above the minimum reserve, reductions below a nominal reserve target (e.g., 7%) are price sensitive.

Trend # 5 – Retail markets and initiatives are blossoming

- The retail side is nowadays one of the more exciting aspects of energy markets
- Municipal Aggregation is accelerating
- Dangers in the motivation for it
 - Costs may be low now
 - But there are substantial risks of increases
- Challenges for sustaining competition
- Lack of a widely accepted methodology for valuation of costs and benefits (value of reliability?)
- Challenges for cost/benefit analysis of programs & initiatives – regulation becomes harder

Electricity Markets and Regulation

1. Luciano de Castro – Kellogg School of Management – Northwestern University
 - Current Worldwide Trends in Electricity Market Design and Regulation
2. Sarah Eichorn – PJM Interconnection, LLC
 - PJM Overview: Market and Regulation Interests
3. Joseph Paladino – DoE
 - Results and Findings from the ARRA-Funded Smart Grid Projects

Electricity Markets and Regulation

4. Jeffrey Orcutt – Illinois Commerce Commission

- Electricity Markets and Regulation in Illinois

5. Paul Alvarez – Wired Group

- Maximizing Benefits for Customers: Regulatory and Governance Opportunities