



Acadia Center

Advancing the Clean Energy Future

An Electric Solution to a Gas Problem

Restructuring Roundtable on Gas Supply & Electricity
Rates in New England

November 21st, 2014

Boston, MA

Peter Shattuck

Director, Clean Energy Initiative

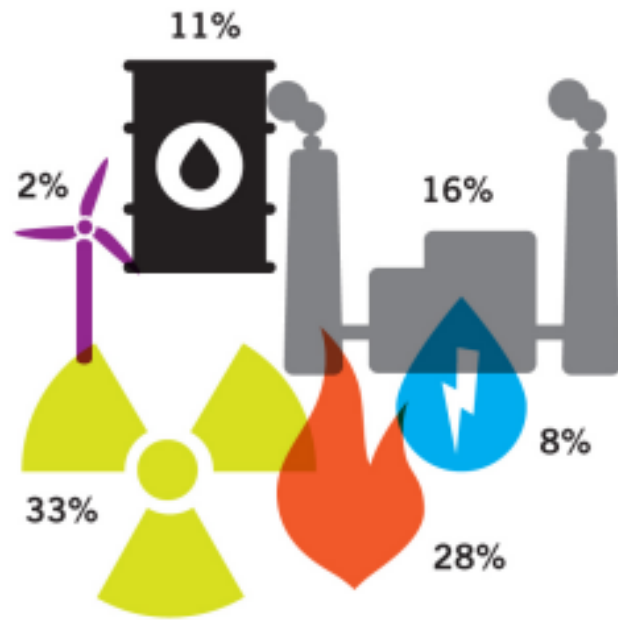
Acadia Center (formerly ENE)

- Environmental Policy, Research, and Advocacy
 - Northeastern Based Non-profit
 - Boston, MA / Providence, RI / Rockport, ME / Hartford, CT / Ottawa, ON, Canada
- Program Areas
 - Energy Policy
 - Climate Change
 - Transportation
 - Forest Practices and Land Use

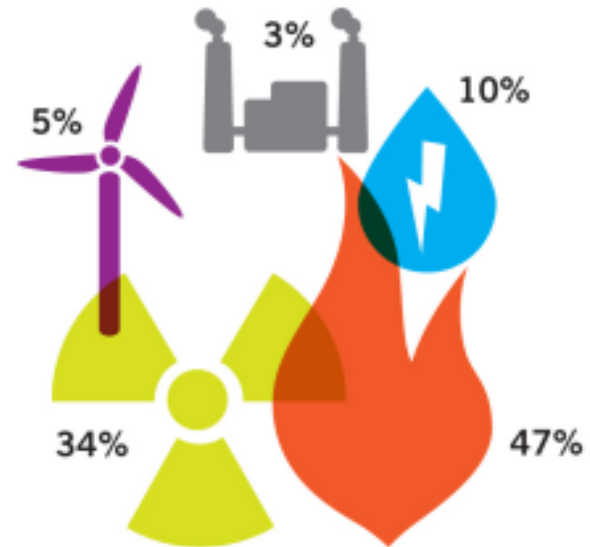


The Problem

Transformed fuel mix...



2001 Generation Mix

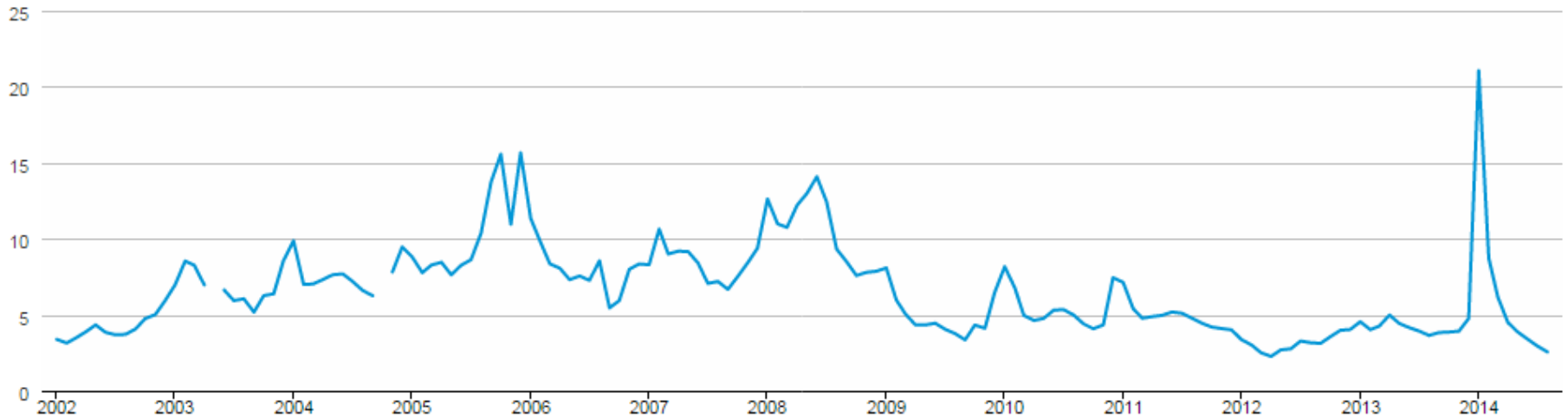


2012 Generation Mix

...with scant new capacity

Fuel price volatility

Dollars per Thousand Cubic Feet

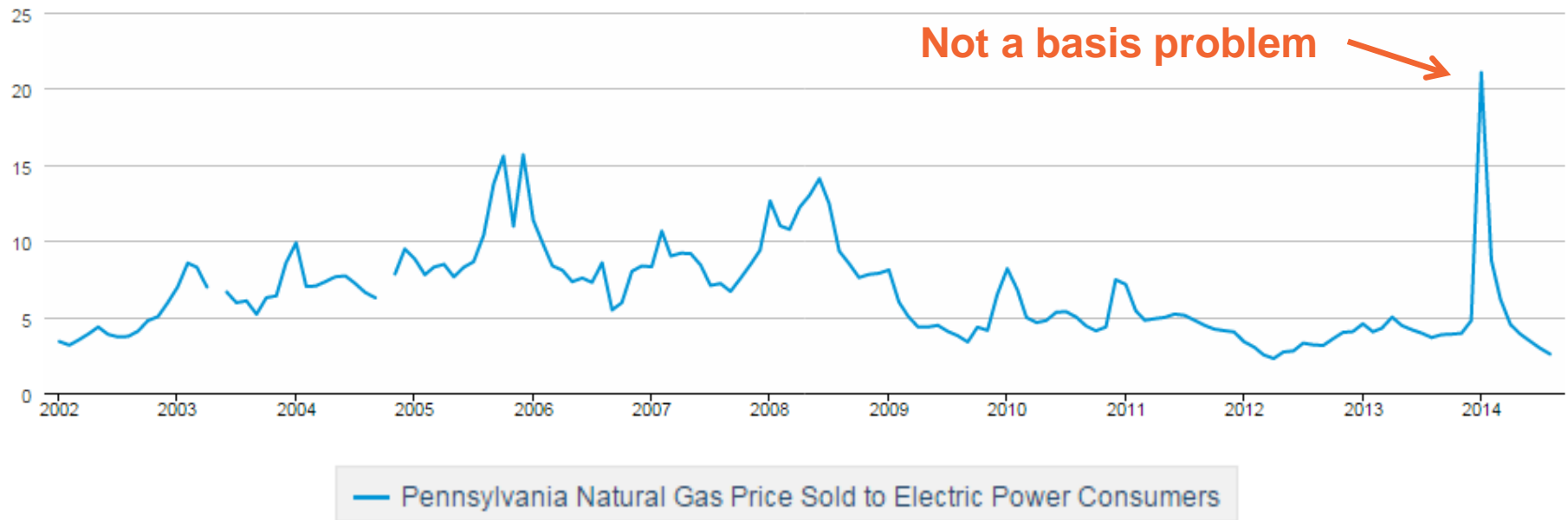


<http://www.eia.gov/dnav/ng/hist/n3045pa3m.htm>

Fuel price volatility

Pennsylvania Natural Gas Price Sold to Electric Power Consumers

Dollars per Thousand Cubic Feet



<http://www.eia.gov/dnav/ng/hist/n3045pa3m.htm>

Increasing natural gas exports

- Driven by economics & (geo)politics
- Upward pressure on domestic prices

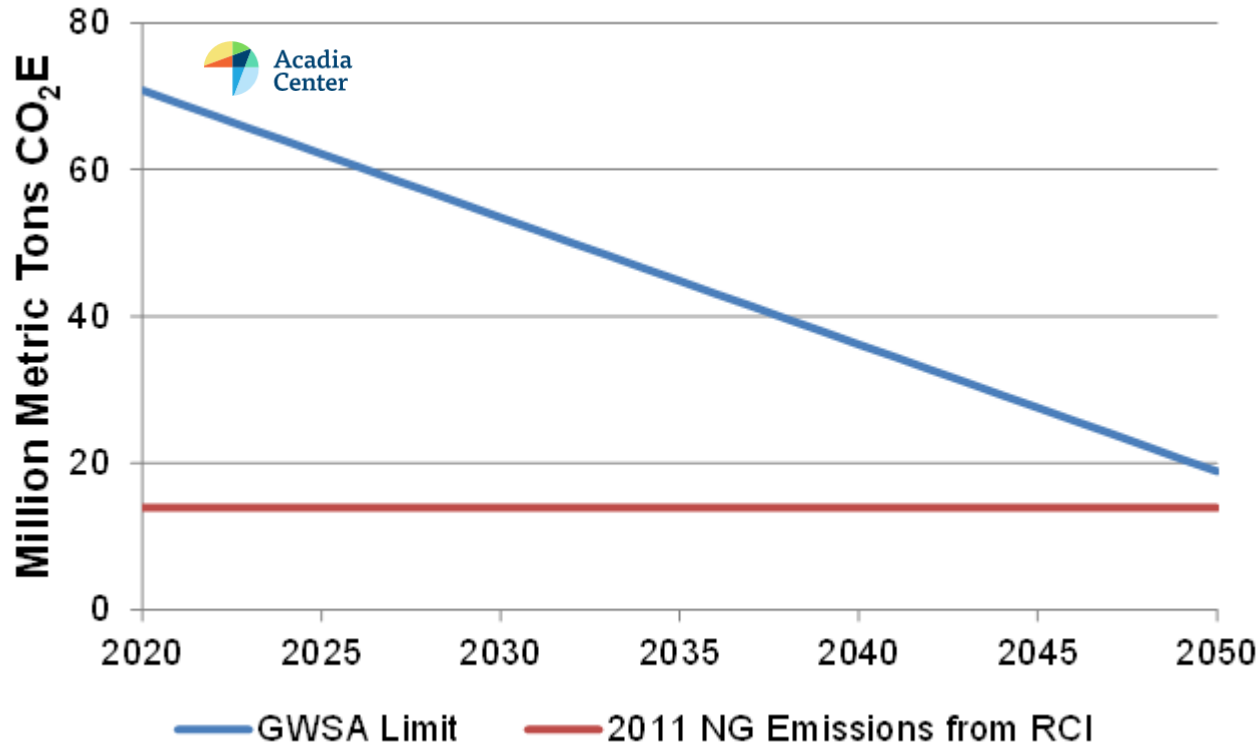
EIA - Effect of Increased Levels of Liquefied Natural Gas Exports on U.S. Energy Markets

- Annual export growth of 2 bcf/d, starting in 2015
- Reaching 20 bcf/d by 2025
- Reference Case => expanded production limits price impact => **\$6.10/Mcf** (2015-2040)
- Low Resource => short supply creates higher price impact => **\$9.00/Mcf** (2015-2040)

Who bears the risk...?

<http://www.eia.gov/analysis/requests/fe/pdf/lng.pdf>

Climate change commitments



Non-power sector natural gas consumption equals:

- 26% of MA carbon budget in 2030
- 38% in 2040
- 75% in 2050

<http://www.mass.gov/eea/air-water-climate-change/climate-change/massachusetts-global-warming-solutions-act/ma-ghg-emission-trends/>

The Solutions

Market Reforms

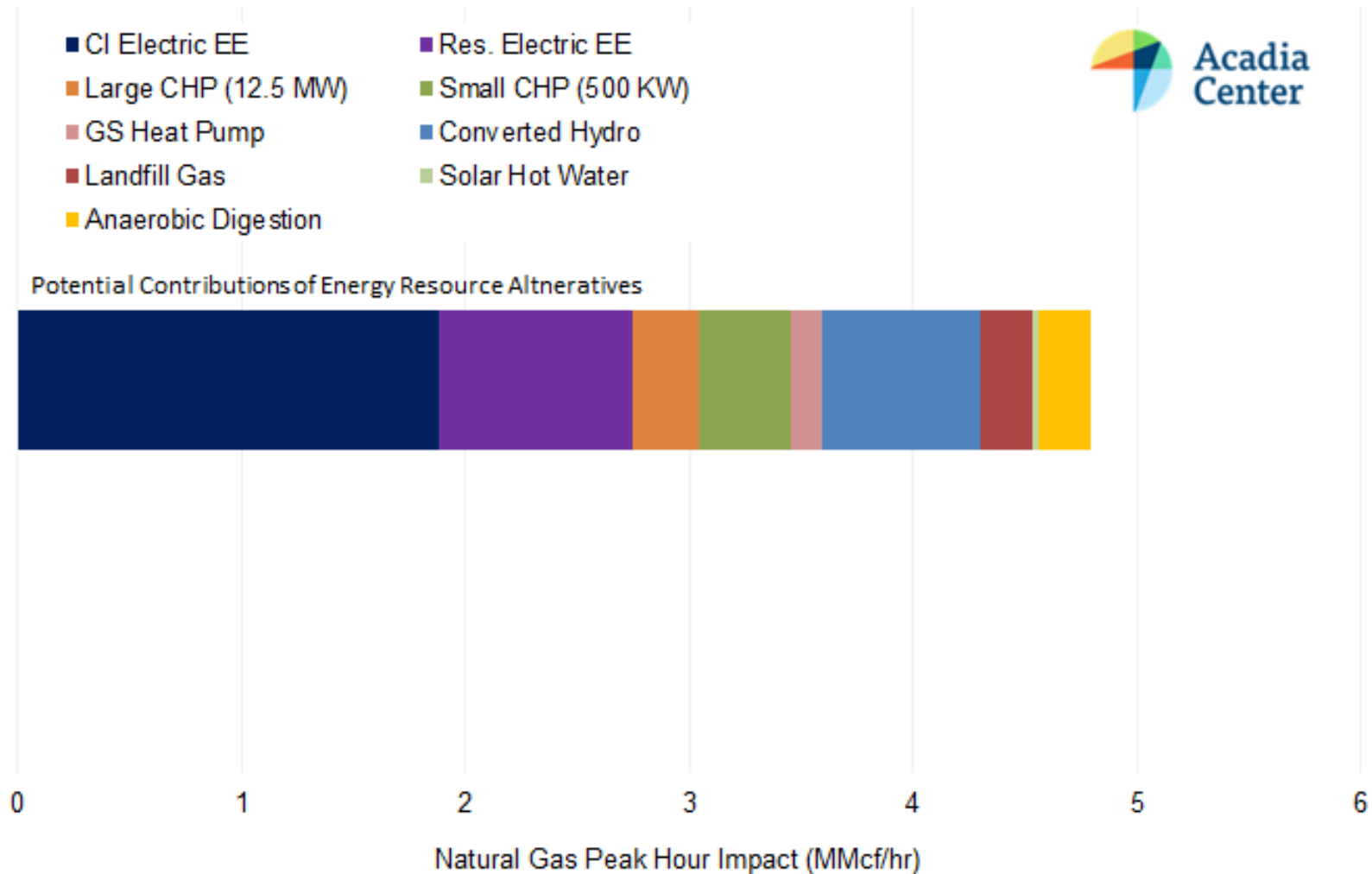
- Gas-Electric Market Alignment
 - Improve utilization of existing pipes

- ISO-NE Winter Reliability Program
 - Compensate generators for fuel purchases
 - 2014/2015 includes liquefied natural gas (LNG)

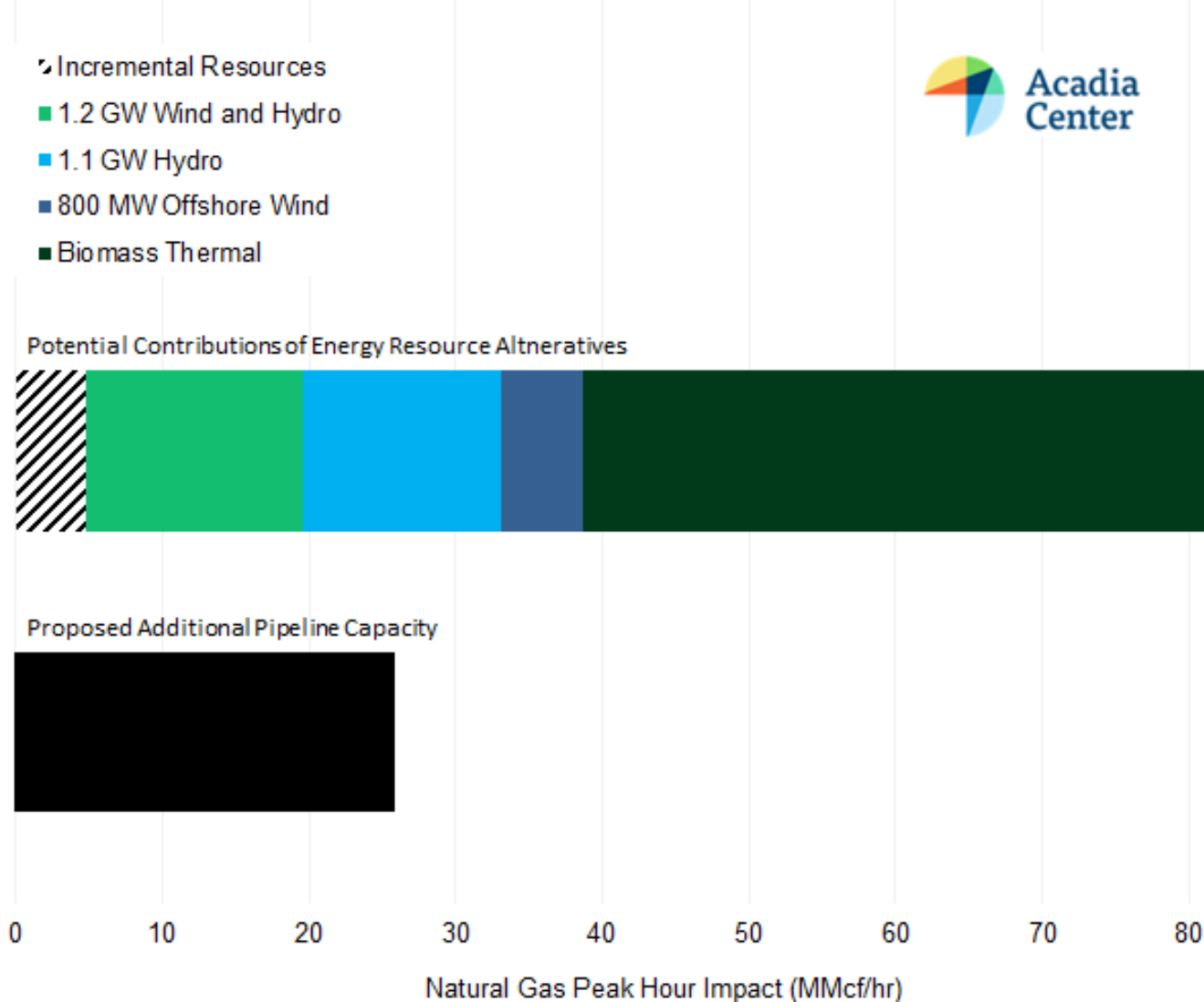
- ISO-NE Pay-for-Performance Program
 - Penalize non-performing generators
 - Reward performing generators

Reduce Demand for Gas

Massachusetts only, no gas efficiency



Alternative Supply – MA + imports



Alternative supply, continued

- Onshore wind – 10-12GW
 - ISO-NE *New England Wind Integration Study*
 - By 2020 could meet 24% of load

- Offshore wind – 10GW
 - Deepwater Wind ~ 1.5GW
 - RI/MA Wind Energy Area ~ 3.4GW
 - MA Wind Energy Area ~5GW

- Hydro – 3GW+
 - Lower Churchill ~ 3.1GW
 - Hydro Quebec surplus

Offshore Wind

➤ Characteristics

- 56% winter capacity factor at London Array with 6MW turbines* (Cape Wind 3.6MW)
- \$0.13-\$0.14/kWh target in UK,** and for Deepwater Wind***
- Far offshore in federal waters

➤ Price suppression

- 700MW of offshore wind would generate \$11 million in savings during 2 winter peak hours in 2014 alone****

* <http://www.windpoweroffshore.com/article/1289338/london-array-production-totals-15twh>

** <https://www.gov.uk/government/groups/offshore-wind-cost-reduction-task-force>

*** <http://www.politifact.com/rhode-island/statements/2013/aug/31/jeffrey-grybowski/deepwater-wind-ceo-jeffrey-grybowski-says-offshore/>

**** Wilson, Whitney J. , 2014, *Offshore Wind: Mitigation of Natural Gas Based Market Price Spikes During Extreme Cold Weather Conditions*

Key Questions

- Transmission
 - Long-term contracts or market-based pricing?

- Offshore wind
 - How much?
 - How soon?

- Hydro
 - Preferable resources?
 - Resource shuffling?

Contact Information

Peter Shattuck
Director, Clean Energy Initiative
(617) 742-0054 x103
pshattuck@acadiacenter.org



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