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# MACRUC Risk and Regulation Workshop

## June 24, 2013

### Key Takeaway Points

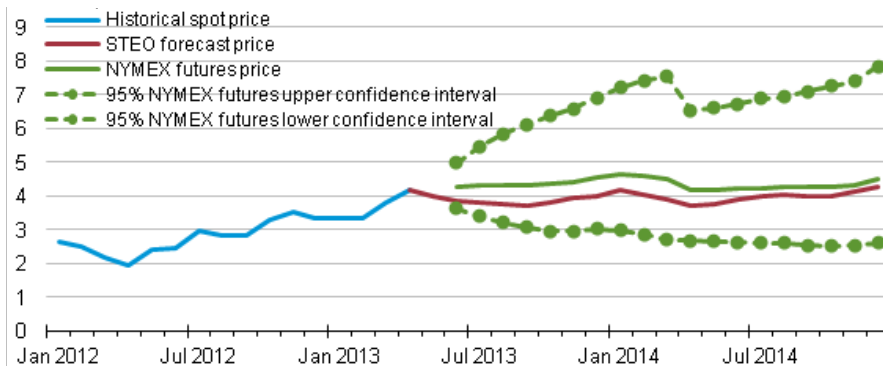
#### **General Concepts Regarding Risk and Regulation**

- Risk affects many decisions made by regulators – whether explicitly addressed or not and there are risks that result from many decisions made by regulators. The goal should be to mitigate and manage risk.
- There are many factors causing increased risks in the industry, including volatile fuel prices, aging infrastructure, plant retirements, technological change, increasingly stringent environmental policies, and more. Some factors causing risk are less obvious.
- It is rare that risk can be eliminated – the goal for regulators is to actively manage risk.
- Management of risk often means balancing competing interests (e.g., cost versus reliability).
- Restructured electric industries create a different landscape of risk for generation services, but risk must still be actively managed by regulators.

#### **General Strategies for Risk Management**

- Explicitly identify and characterize risks involved in decision making. What are the potential costs at stake?
- Collect information and conduct appropriate analyses to best understand key risks. Proper balancing of interests requires a full understanding of risks involved. Consider the pros and cons from a risk standpoint for the decision pathways.
- Utilize robust planning practices that include probabilistic simulations and scenarios analyses.
- Diversify resource portfolios, including fuel type, fuel source, contract length, geographic diversity, physical hedges and financial hedges.
- Employ transparent and innovative ratemaking practices that reveal risk and hold utilities accountable for risk.

**Future fuel expenditures are highly uncertainty; note the range of NYMEX confidence intervals in the EIA gas price forecasts below.**



Note: Confidence interval derived from options market information for the 5 trading days ending May 2, 2013. Intervals not calculated for months with sparse trading in near-the-money options contracts.

Source: Short-Term Energy Outlook, May 2013

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## Addressing Risk in Specific Contexts

- **Rate-making:** Test years, rate riders, decoupling and other ratemaking practices have risk implications. These might have implications for allowed return on equity.
- **Retail Markets:** Require regulatory oversight over terms and conditions of service, and proper market structure.
- **Basic Service:** Well defined procurement process with oversight and portfolio management techniques can manage risk well, potentially at low costs.
- **Reliability/Outages:** Metrics and data collection such as LOLE, SAIDI, SAIFI, and MAIFI are an example for rest of industry.
- **Environmental Compliance:** Risks associated with complying with current and future environmental regulations should be accounted for in a comprehensive and rigorous manner.
- **Energy Efficiency:** The risks created by energy efficiency can typically be managed and mitigated. Efficiency offers the potential for reducing risk (reliability, price stability, cost, fuel diversity environmental), but this benefit is rarely accounted for when screening energy efficiency.
- **Renewable Resources:** Might create risks associated with grid integration and grid stability, but these can often be mitigated or eliminated by market design. Can offer a variety of risk benefits, such as fuel diversity, price stability, technological diversity, and reduced environmental risk.
- **Grid Modernization:** Can reduce risks of outages, but can include risks associated with stranded costs, technology obsolescence, customer adoption and customer response.

## One element of risk management: ranking of risks associated with resource options

RELATIVE RISK EXPOSURE OF NEW GENERATION RESOURCES							
Resource	Initial Cost Risk	Fuel, O&M Cost Risk	New Regulation Risk	Carbon Price Risk	Water Constraint Risk	Capital Shock Risk	Planning Risk
Biomass	Medium	Medium	Medium	Medium	High	Medium	Medium
Biomass w/ incentives	Medium	Medium	Medium	Medium	High	Low	Medium
Biomass Co-firing	Low	Low	Medium	Low	High	Low	Low
Coal IGCC	High	Medium	Medium	Medium	High	Medium	Medium
Coal IGCC w/ incentives	High	Medium	Medium	Medium	High	Low	Medium
Coal IGCC-CCS	High	Medium	Medium	Low	High	High	High
Coal IGCC-CCS w/ incentives	High	Medium	Medium	Low	High	Medium	High
Efficiency	Low	None	Low	None	None	Low	None
Geothermal	Medium	None	Medium	None	High	Medium	Medium
Geothermal w/ incentives	Medium	None	Medium	None	High	Low	Medium
Large Solar PV	Low	None	Low	None	None	Medium	Low
Large Solar PV w/ incentives	Low	None	Low	None	None	Low	Low
Natural Gas CC	Medium	High	Medium	Medium	Medium	Medium	Medium
Natural Gas CC-CCS	High	Medium	Medium	Low	High	High	Medium
Nuclear	Very High	Medium	High	None	High	Very High	High
Nuclear w/ incentives	Very High	Medium	High	None	High	High	Medium
Onshore Wind	Low	None	Low	None	None	Low	Low
Onshore Wind w/ incentives	Low	None	Low	None	None	None	Low
Pulverized Coal	Medium	Medium	High	Very High	High	Medium	Medium
Solar - Distributed	Low	None	Low	None	None	Low	Low
Solar Thermal	Medium	None	Low	None	High	Medium	Medium
Solar Thermal w/ incentives	Medium	None	Low	None	High	Low	Medium