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Capacity Issues Technical Conference State of New Jersey

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Biography – Brian Chin

Electric Utilities (2009-present)

Constellation, Dominion, DTE Energy, FPL, Edison Intl, Entergy, Exelon, PSEG, AEP, Duke, Con Edison, NV Energy, Pacific Gas & Electric, Pinnacle West, Southern, FirstEnergy, Allegheny, PPL Corporation, Progress Energy

Energy Merchants (2004-present)

Calpine, Comverge, Dynegy, Mirant, NRG Energy, RRI Energy

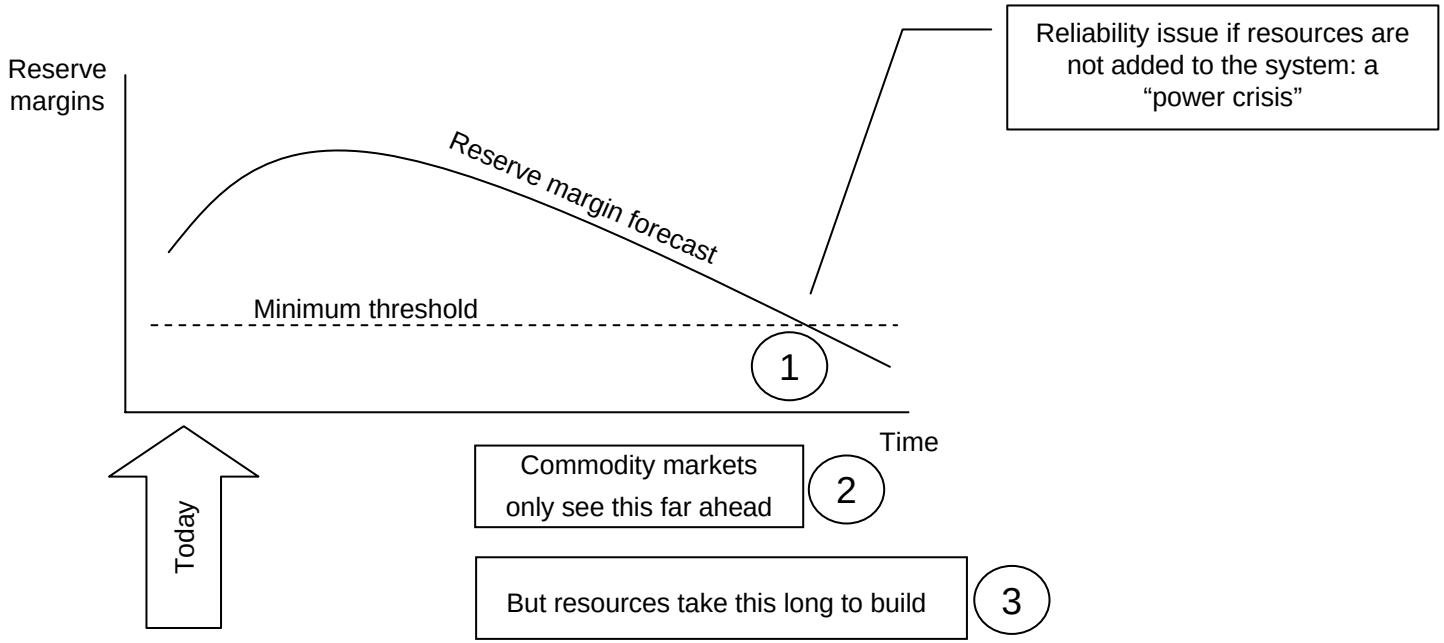
Brian Chin, Director, joined the Salomon Smith Barney in 2001 and is Citigroup's Electric Utilities. He has been a part of the Electric Utilities team since 2001. Brian was also Citigroup's Engineering & Construction analyst (being then a dual sector analyst) from 2006-2009. Prior to joining Citi, he was a founder of iBenefits, a startup concern and was a Certified Public Accountant at KPMG Peat Marwick. He holds an MBA from Duke University and a BS from UC Berkeley.

Brian has been quoted frequently in the press/media, including *The Wall Street Journal*, CNBC, the *New York Times*, Bloomberg News, and Dow Jones. His research has received steady industry recognition, including the following:

- Greenwich Associates Survey: Electric Utilities (#4 in 2010), Independent Power (#1 in 2006, 2007, 2008 and 2009)
- Greenwich Associates Survey: Engineering & Construction (#1 in 2007, #2 in 2008, #3 in 2009 and #2 in 2010).
- *Forbes Magazine/Starmine*: Independent Power (Top 3 in 2006, 2007, 2009).
- *The Wall Street Journal*: Electric Utilities (#2 in 2008).
- Institutional Investor: (Citigroup/Salomon Utilities team ranked in 2002, 2005-2008)

An Ongoing Debate For Regulators: To Intervene Or Not To Intervene?

- **What is the right balance of reliability, price volatility, market integrity and investment attractiveness?**
- **The factors at play can be visualized by these three basic elements:**



- **So the question becomes, to what extent should policymakers intervene "ahead" of a crisis?**

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An Ongoing Debate For Regulators: To Intervene Or Not To Intervene?

- **Static arguments why policy intervention is needed:**
  - Forward commodity prices do not provide enough liquidity to obtain financing
  - Environmental policy uncertainty is high
  - Forward commodity prices do not reflect tight reserve margins till it is too late for resource development
  - Beneficiaries of intervention: reliability advocates, project developers, project financiers
- **Static arguments why policy intervention is not needed:**
  - Policy tweaks usually undermine integrity of competitive power market
  - Subsidizing new generation reduces profitability of preexisting generation
  - Beneficiaries of non intervention: owners of preexisting resources, energy traders

Is Generation Intervention Needed?

- **Non static arguments to consider *on the margin*:**
  - Are reserve margin forecasts tightening or loosening? *Will start to tighten, but slowly.*
    - **Factors tightening the reserve margin forecast**: *economic growth improves*, less smart grid/conservation development
    - **Factors lengthening the reserve margin forecast**: economic growth slows, *more smart grid/conservation development*
  - Are resources taking longer or shorter to develop? *Neither.*
    - **Factors shortening resource build times**: *lower natural gas prices tilting resource development to peakers*, less restrictive environmental policy
    - **Factors lengthening resource times**: higher natural gas prices tilting resource development to coal/nukes, *more restrictive environmental policy*
  - Are commodity/energy/capacity markets becoming more accommodating or less? *More accommodating.*
    - **Factors extending market views:** longer PPA durations, *higher capacity market prices*
    - **Factors contributing to market shortsightedness:** shorter PPA durations, lower capacity market prices

Is Generation Intervention Needed?

- **In our view, there is *less* need for aggressive policy intervention at this time.**
  - Reserve margins are tightening but will do so slowly.
  - Average resource development time is neither lengthening nor shrinking.
  - Capacity/commodity markets are starting to show signs, particularly RPM.
- **The balance of risks over the next three years is that intervention need will likely escalate gradually from here.**
  - Biggest wildcards: Natural Gas forward prices and Environmental policy (MACT definitions in 2011)
- **In our view, energy/capacity markets are providing a signal that capital should not be deployed to generation at this time, unless subsidies are enacted**
  - Although commodity markets are notoriously shortsighted, we believe policymakers still have leeway to defer intervention decisions for the next 1-2 years.
  - Capacity markets hit a recent inflection point.

Is Generation Intervention Needed?

- **Is RPM working enough?**
  - In our opinion, yes. Capital markets are attuned to capacity price auctions. Capacity prices increasingly affect asset valuations (Calpine/Connectiv). Mothballing of capacity has been prevented.
  - What could be improved?
    - Capacity durations could be extended, at the cost of increased environmental policy risk
    - Demand curve slopes could be made less steep – reducing pricing volatility
- **Is DSM a solution?**
  - In our opinion, DSM has pros and cons.
  - Pros: inexpensive install cost, some types of DR are extremely reliable
  - Cons: extremely expensive energy cost, provides a false sense of reserve margins
  - Anecdotal evidence suggests DSM adoption rates are slowing in PJM East