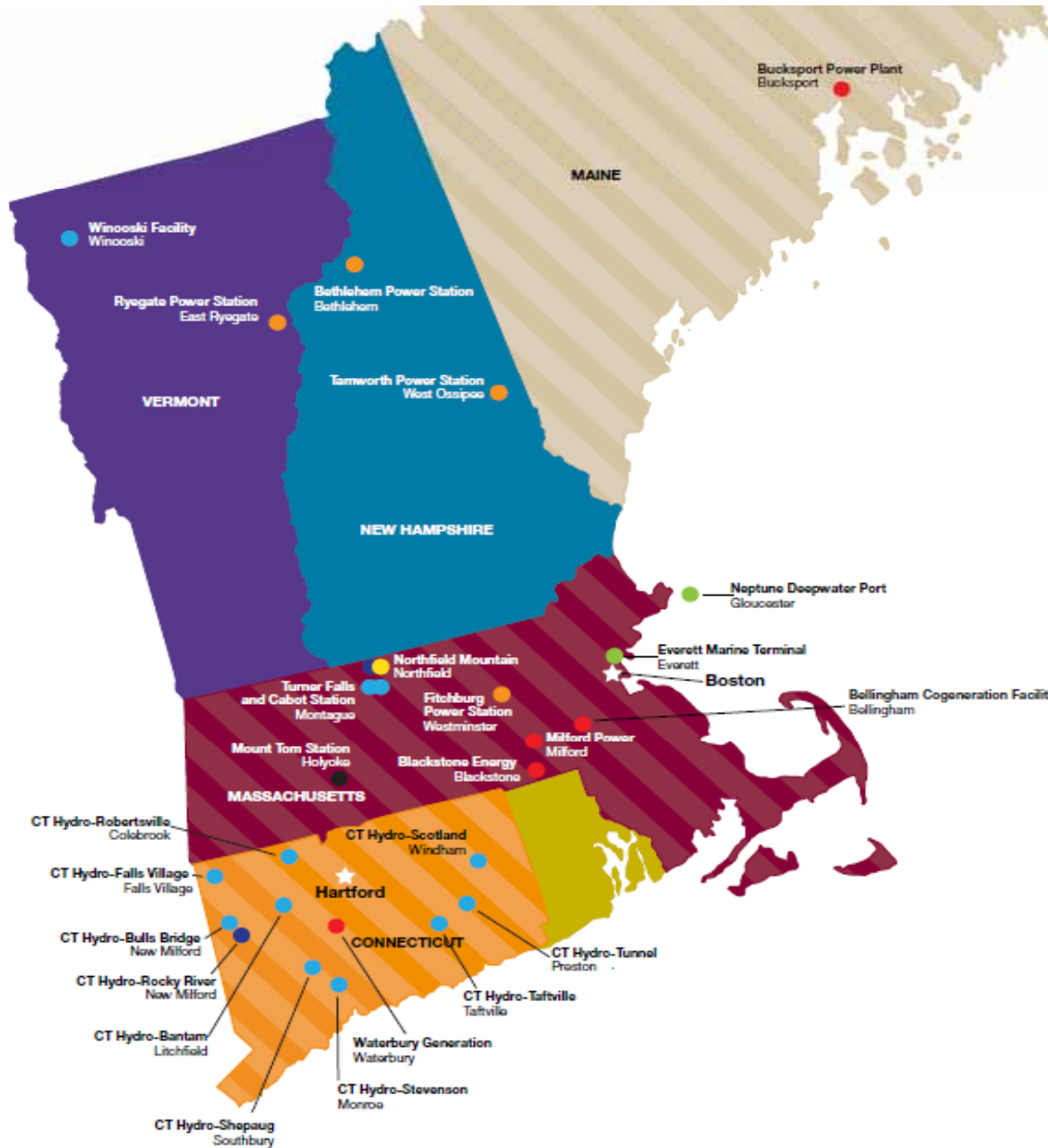


## Gas – Electric Market Coordination

Tom Kaslow

May 21, 2012





## New England Asset and Business Location Map

IPR-GDF SUEZ North America provides critical energy infrastructure to serve the natural gas, retail electricity and power generation needs of customers throughout New England.

- Biomass
- Hydro
- Pumped Hydro Storage
- LNG Facility
- Solar
- Coal
- Natural Gas
- ☆ Business Office

The company's retail subsidiary, GDF SUEZ Energy Resources NA, serves commercial and industrial electricity customers in Maine, Massachusetts and Connecticut.



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# — Gas-Fired Generation “Caught in the Middle”



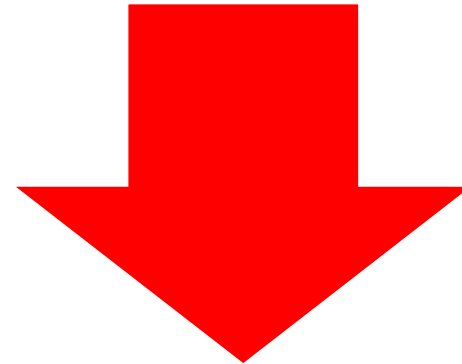
## Gas Market

- Long term firm contracts
- Uniform take tariff design (limited flexibility)
- Predominately advance markets (limited real time markets)
- Gas Day 10am-10am

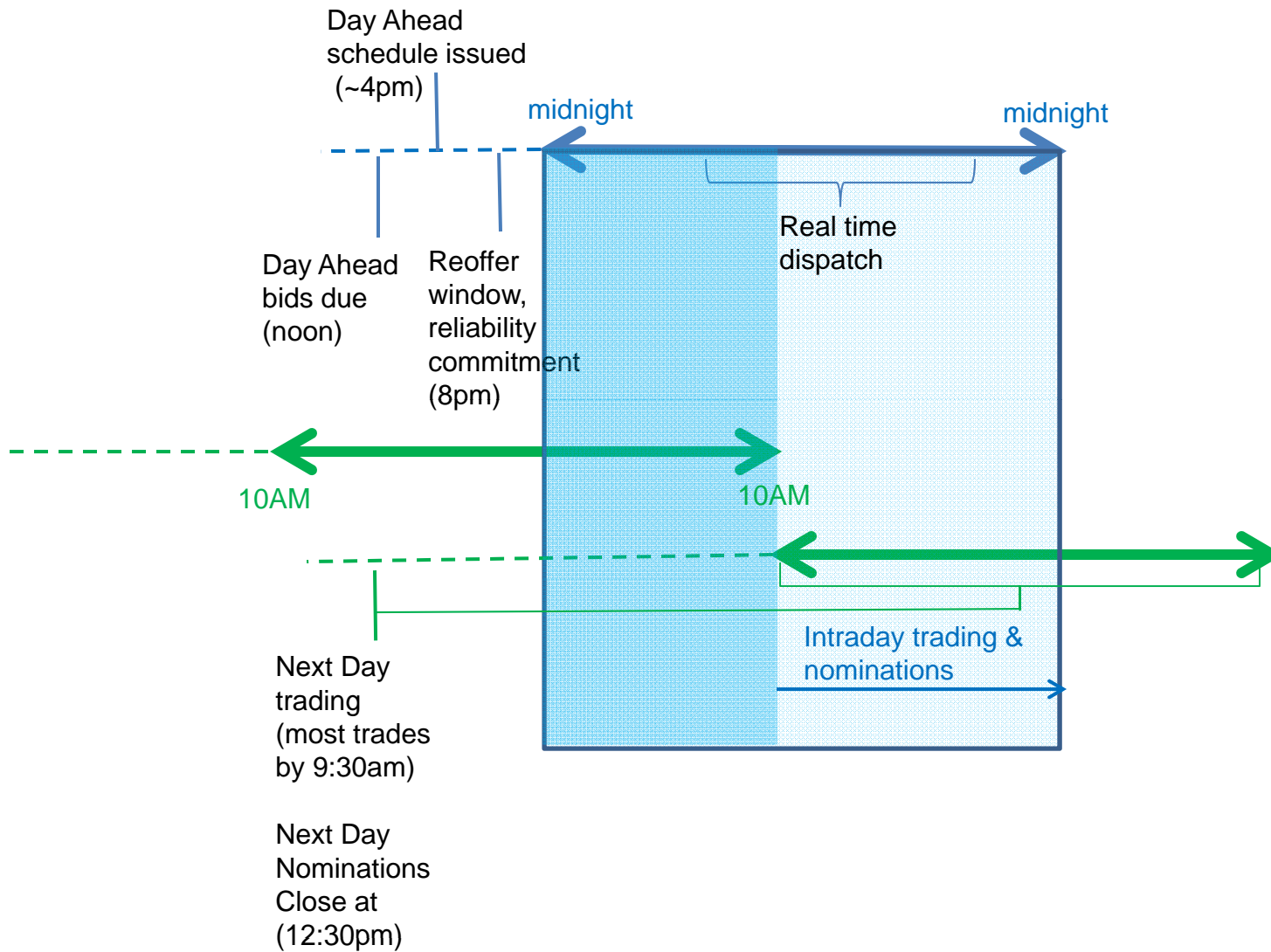
Gas-fired generation

## Electric Market

- One year capacity contract – firmness nor flexibility valued
- Energy market – firmness nor flexibility valued
- Real time scheduling & dispatch (limited notice)
- Electric Day midnight to midnight



# Electric Day and Gas Day Differences



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## — Difficult scheduling tools for an electric dispatch

- Additional challenges to schedule coordination
  - Gas market is illiquid beyond ~9 am each day and is virtually non-existent on weekend/Monday
  - Generators bid into ISO-NE's Day Ahead Energy Market (DAEM) by noon for the next day and DAEM schedule issued by 4:00 pm
  - Generators must buy gas for next day more than 3 hours before bids are submitted, 6 hours before DAEM clears, earlier for generation between midnight and 10am
  - Generators must buy gas on Friday for weekend and Monday without knowing generation obligations
  - Concern that OFOs and ratable take restrictions may become more frequent
  - These gaps create risk for generators which translates into higher consumer prices
- Natural gas-fired generators supply significant amount of daily energy, ramp to meet electric load shape, and more flexibility will be needed to address variability of increasing amounts of intermittent resource generation (e.g. wind, solar)
- Increased gas procurement and scheduling flexibility will be even more important

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# — Areas of Potentially Useful Improvements

- **Convergence & coordination**
  - Shared information between ISO-NE and pipeline operators
    - Coordination of planned outages
    - Impacts of potential demand changes & capability of pipeline to support those changes
  - Improved electric energy market pricing
  - Earlier electric Day Ahead Energy Market (DAEM) clearing process presents tradeoffs
- **Flexibility**
  - Facilitate increased intraday/weekend gas market liquidity
  - Permit more frequent updates to electric market bids
  - Explicitly value flexible generator operational capabilities in the electric market
- **Firmness**
  - Accommodate uncertainty in gas-fired electric generation demand
    - New gas services (e.g., no notice service, park & loan, variable take)
  - Explicitly value firmness of supply in electric market
    - Energy market pricing
    - Capacity market performance incentives