

Regional REC Supply and Demand Projections



**Renewable Energy
Markets 2009**

Claire Kreycik

9/14/09

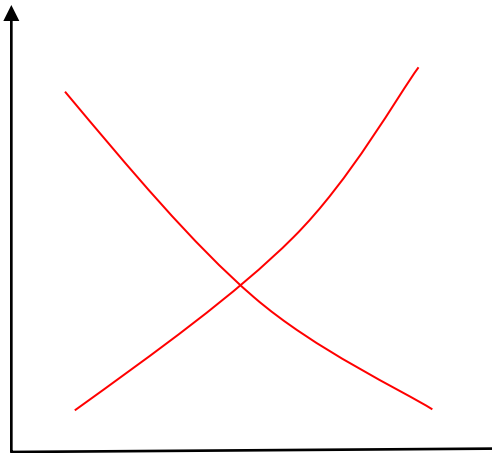
Compliance and Voluntary Markets Session

- Claire Kreycik, NREL
- Andreas Karelak, CRS
- Jonathan Brown, Spectron Energy
- Ryan Cook, Clear Energy Brokerage

Supply-Demand Balance Analysis

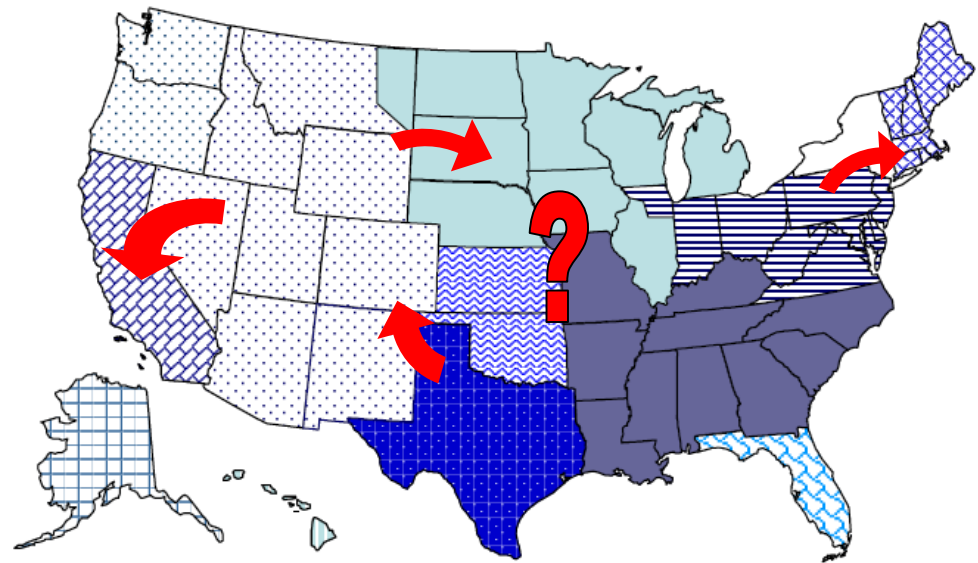
Based on NREL report:

“Regional Supply and Demand Balance for Renewable Electricity in U.S.” Bird et al 2009



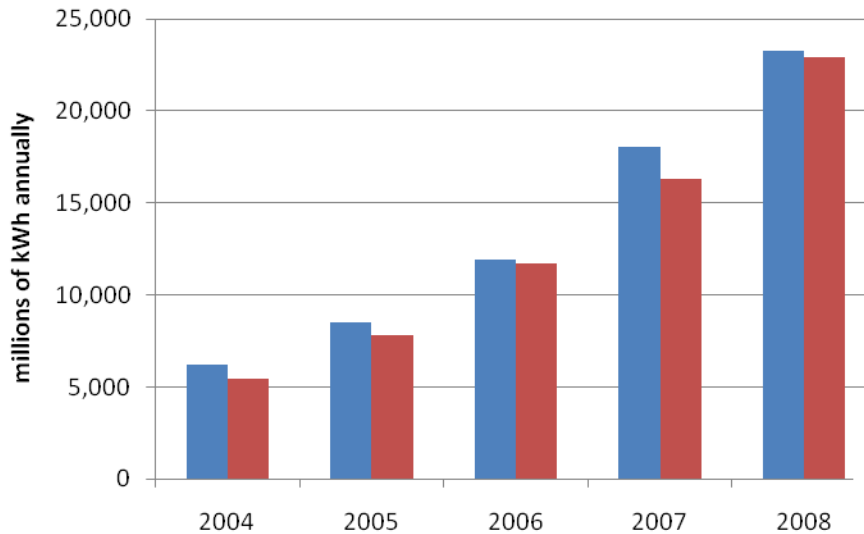
Surplus

Shortage



- | | | |
|------------|-----------|--------------|
| West | Heartland | New England |
| California | Southeast | Mid Atlantic |
| Texas | Florida | Hawaii |
| Midwest | New York | Alaska |

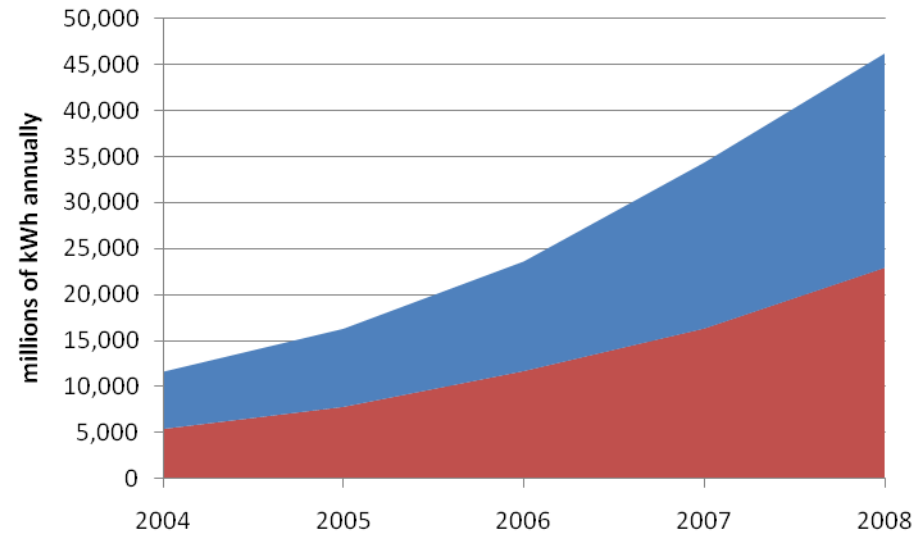
Demand: Compliance and Voluntary Markets



■ Voluntary
■ Compliance (new renewables)

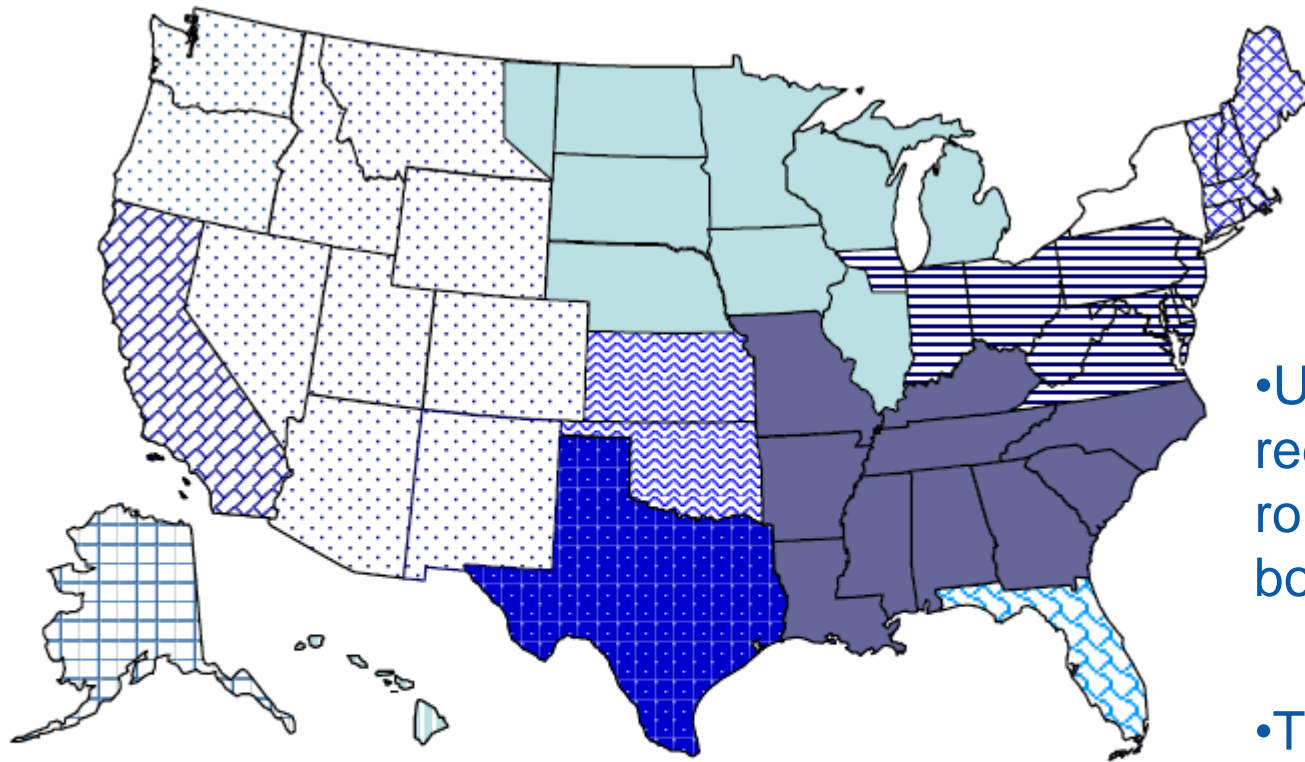
Voluntary market data are from utility and marketer surveys

Compliance market data are from RPS schedules (assumes full compliance)



Source: LBNL/UCS (RPS data) and NREL (voluntary markets)

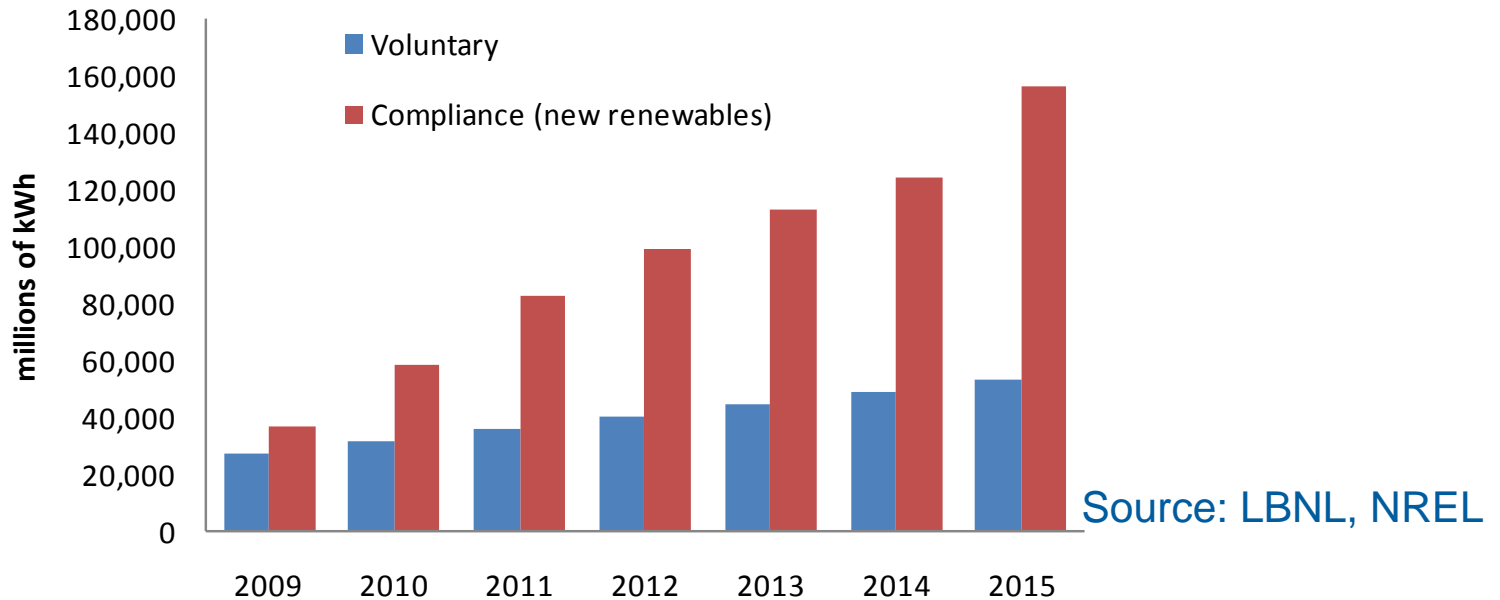
Regions defined by the analysis



- Used RTOs and NERC regions (generally rounded to state boundaries)

- These regions mimic RPS geographic eligibility to the extent possible, but do not fully address all eligibility rules

Demand Growth Projections

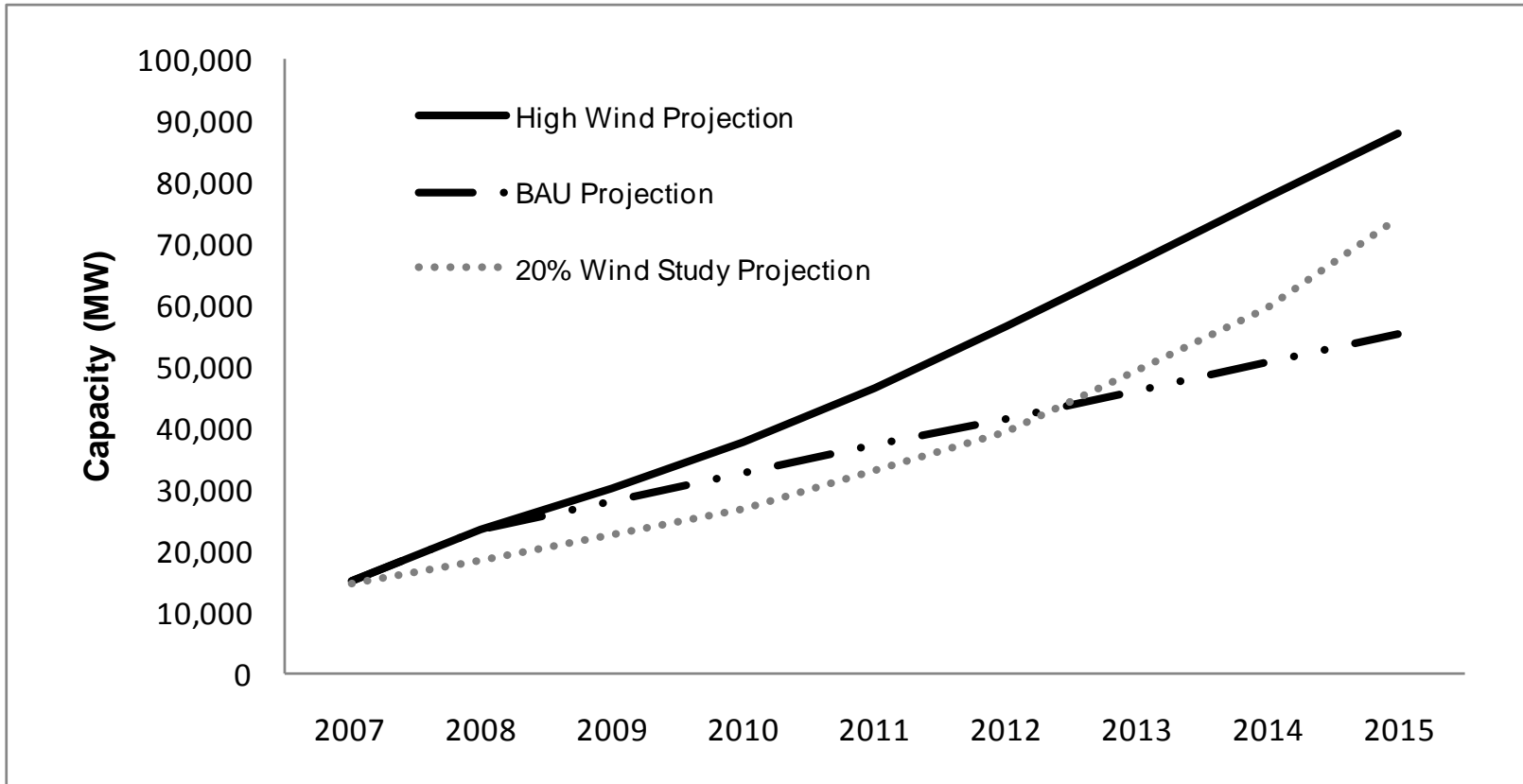


- Voluntary demand growth: assumed linear growth
- Compliance demand growth: aggregated the renewable generation requirements of all existing state RPS
 - California RPS target: 20% by 2010 (IOU), 15% by 2015 (POU) assumed

Supply Growth Projections

- Wind is most significant RE supply source, modeled two growth scenarios:
 - 1) Business as usual wind scenario
 - 2) high wind scenario (based on BTM Consult forecast)
- For the other technologies, linear growth trends and insight from experts (e.g. EPA's LMOP) were used to project supply
- Analysis does not take into consideration the impacts of the financial crisis, or provisions in ARRA

National capacity projections through 2015



- Our scenarios exceed the DOE 20% wind study in early years, but bound it in later years

2015 OUTLOOK

Notable Surpluses

Midwest

Heartland

Texas

West

Shortages

New England

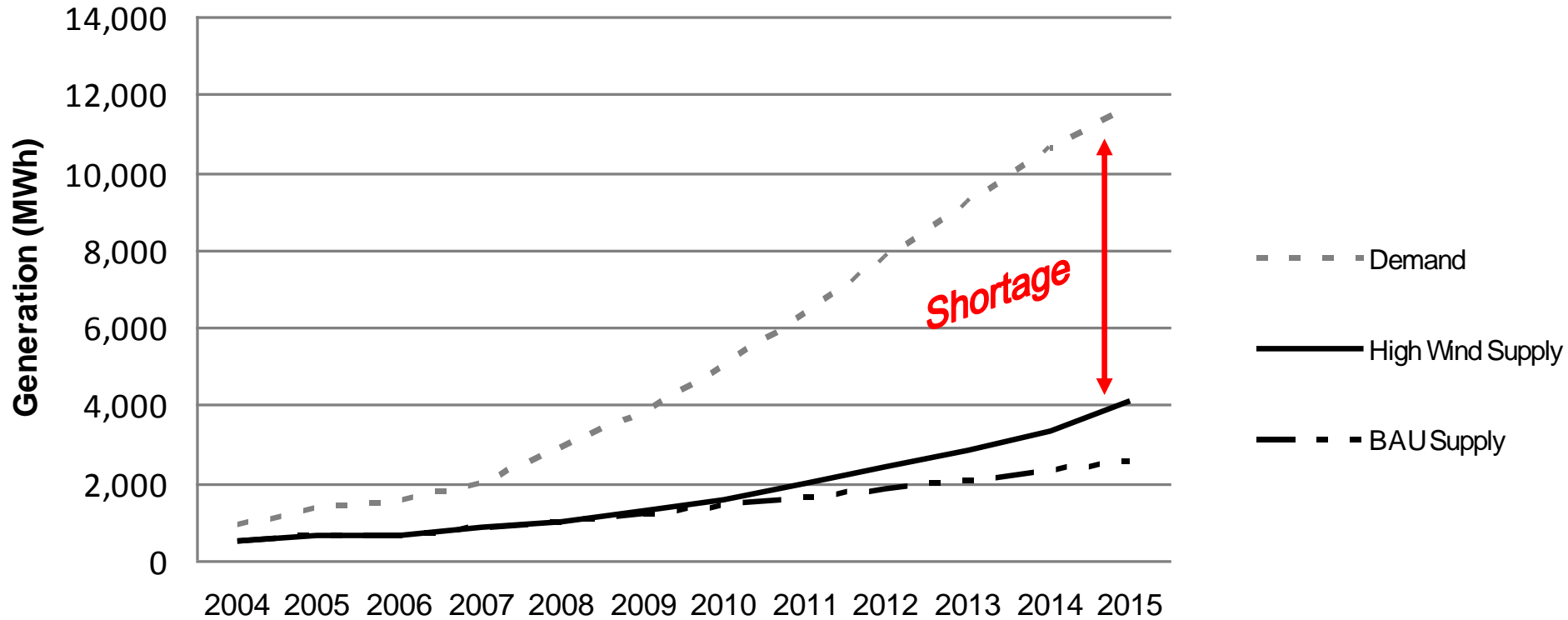
New York

Mid-Atlantic

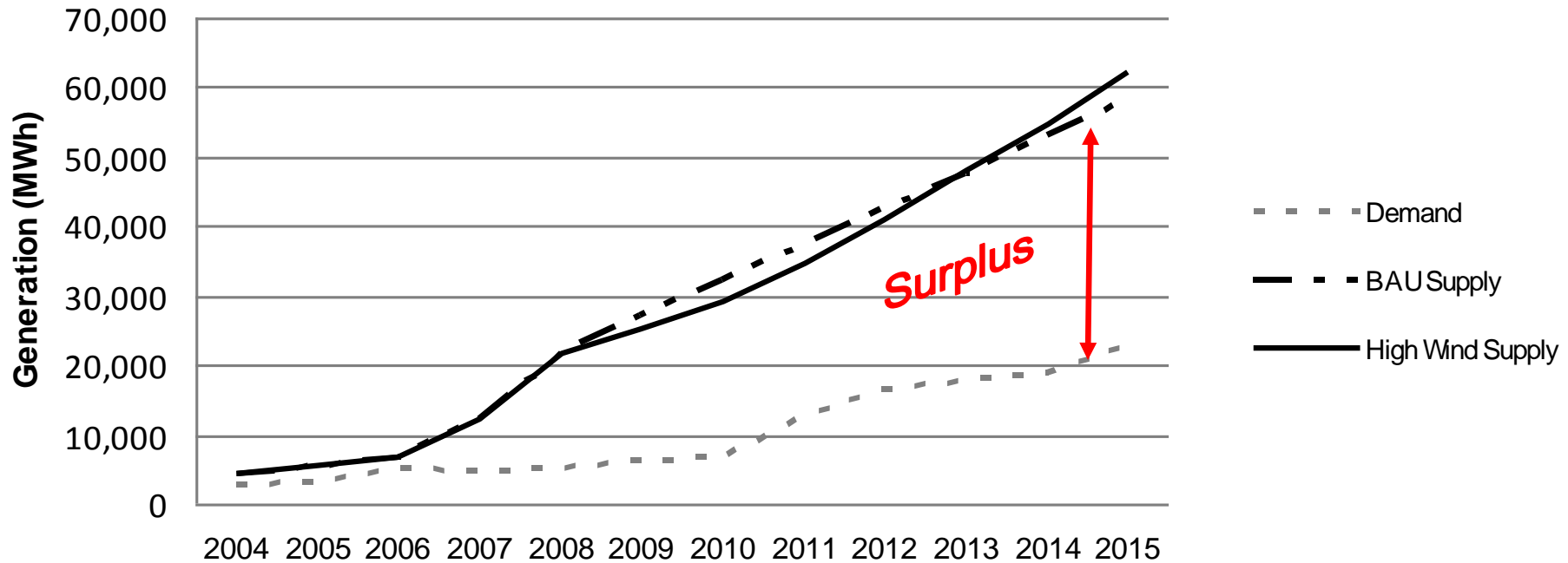
Note: This analysis does not assume trading between the regions specified, though such trading may be feasible and could possibly address shortages



New England Projection



Midwest Projection



Key Uncertainties

- Adoption of additional state RPS policies, federal RPS, or climate policies
- Federal renewable energy tax credits and ARRA
- Impact of the financial crisis
- RPS compliance and REC rules
- Development of offshore wind
- Pace of transmission expansion
- Growth of voluntary markets

Policy can remove barriers

- Lack of liquidity and fungibility in the REC markets
 - Geographic eligibility rules
 - Differences in REC treatment
- Transmission constraints may make interregional transfers difficult

- To alleviate potential shortfalls and enable states to access least-cost renewables, decision makers must:
 - Remove barriers to development,
 - add new transmission,
 - expand interregional REC trading,



Thank you!

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