Massachusetts Department of Energy Resources

Creating A Greener Energy Future For the Commonwealth

Perspectives on Transmission Needs

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Commissioner
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Transmission Perspectives

- *The grid that powers the tools of modern life -- computers, appliances, even BlackBerrys – looks largely the same as it did half a century ago."*

  President Barack Obama
  (DOE Secretary Chu quoted 9-21-2009)

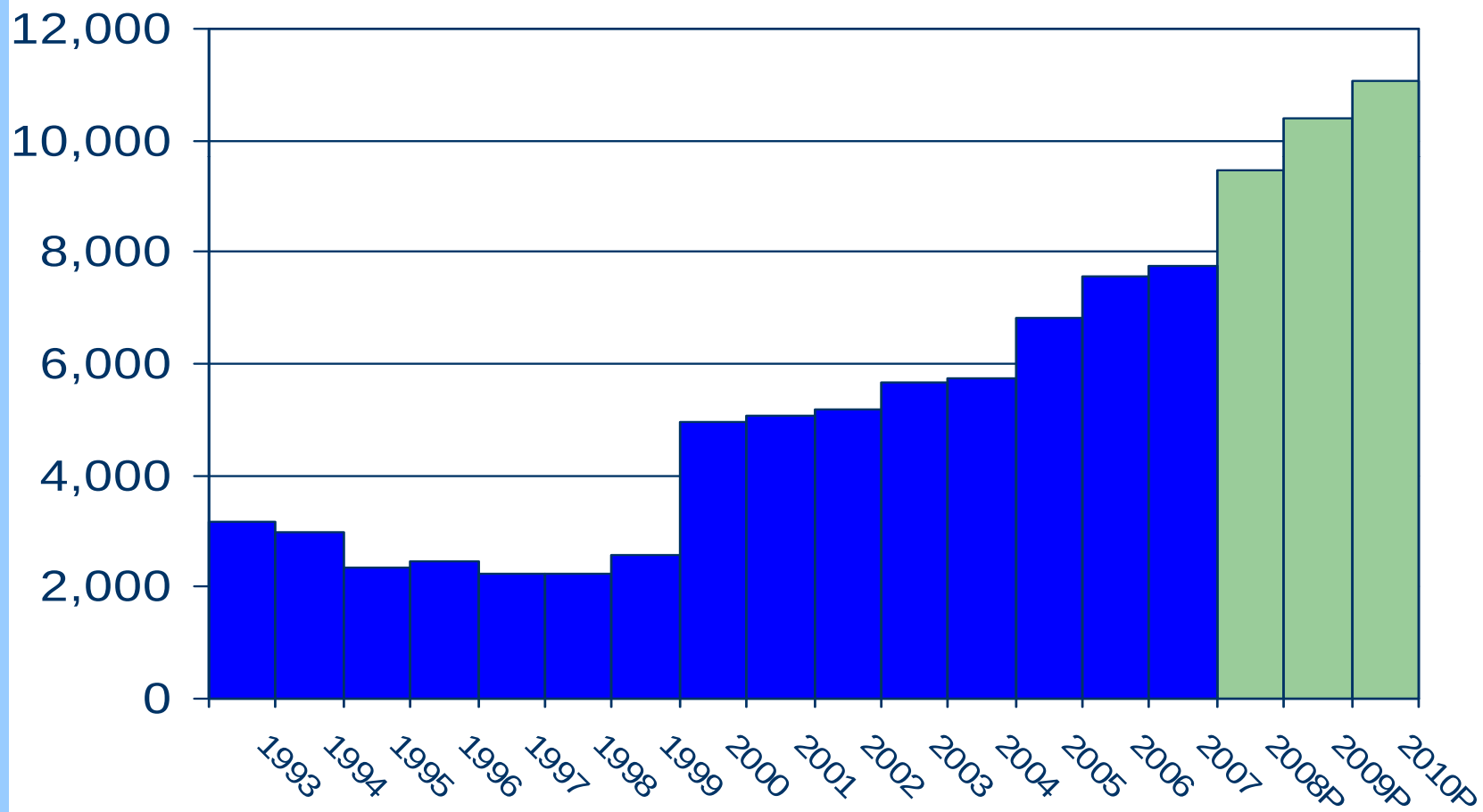
- *"We need an interstate transmission superhighway system,"*

  Suedeen G. Kelly, FERC (NYT 8-27-2008)

- ``*We are a major superpower with a third-world electrical grid,"*
  ``*Our grid is antiquated. It needs serious modernization."*

  Gov. Bill Richardson, New Mexico, former DOE Secretary
  (NYT 8 14-2003)

Transmission Capital Spend



Source: EEI 2009; 2005

Utility of Transmission

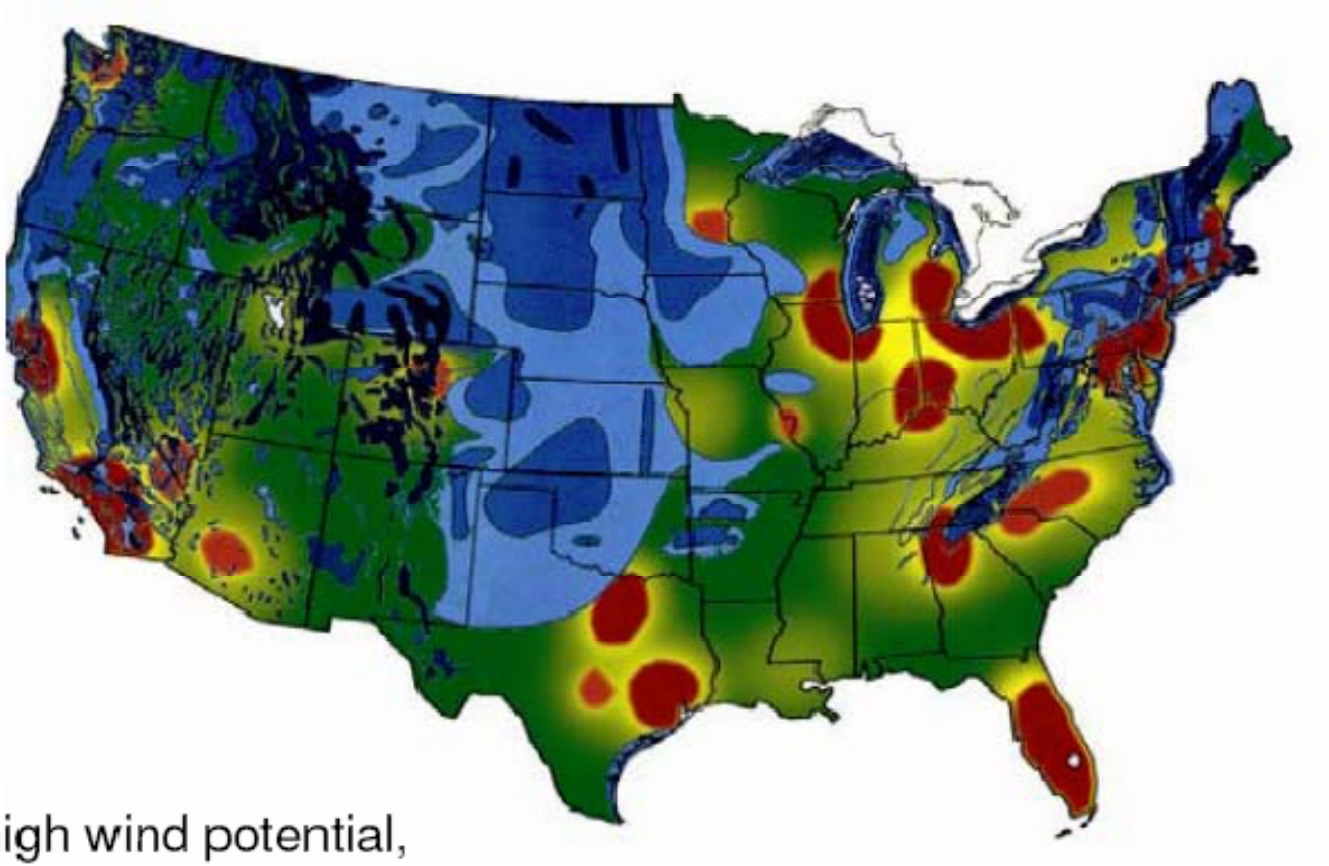
- Desired Outcomes
  1. Improve reliability
  2. Reduce electricity customers costs
  3. Reduce carbon emissions

  → transmission: no unique ability to provide any desired outcome; only a portion of value chain

- Formidable Challenges
  1. Who pays? cost and disruption
  2. Who benefits?
  3. Who's in charge?

Search for simple solutions → new new things

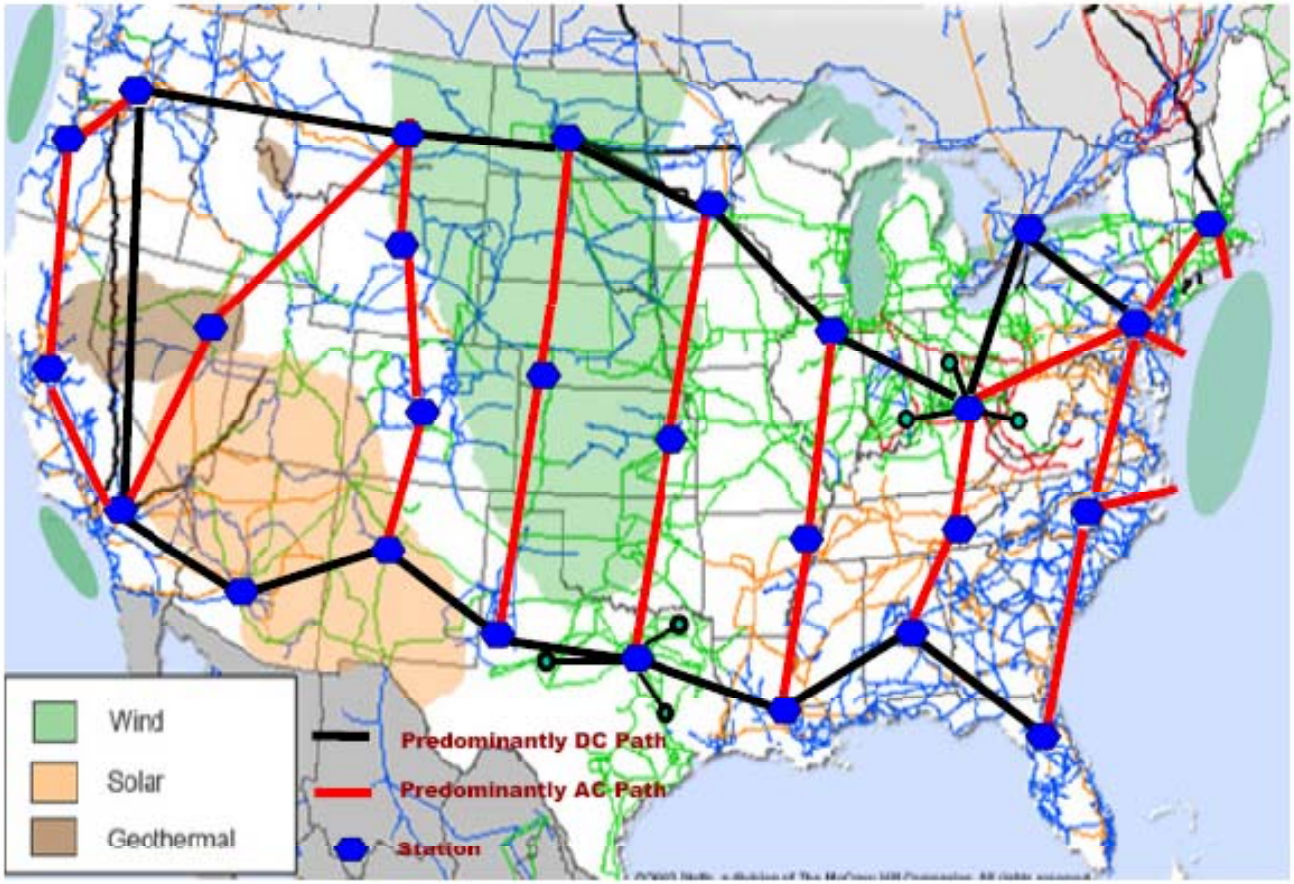
Wind Potential



Blue - high wind potential,
Red - large demand centers, and
Green - little wind and smaller demand centers.

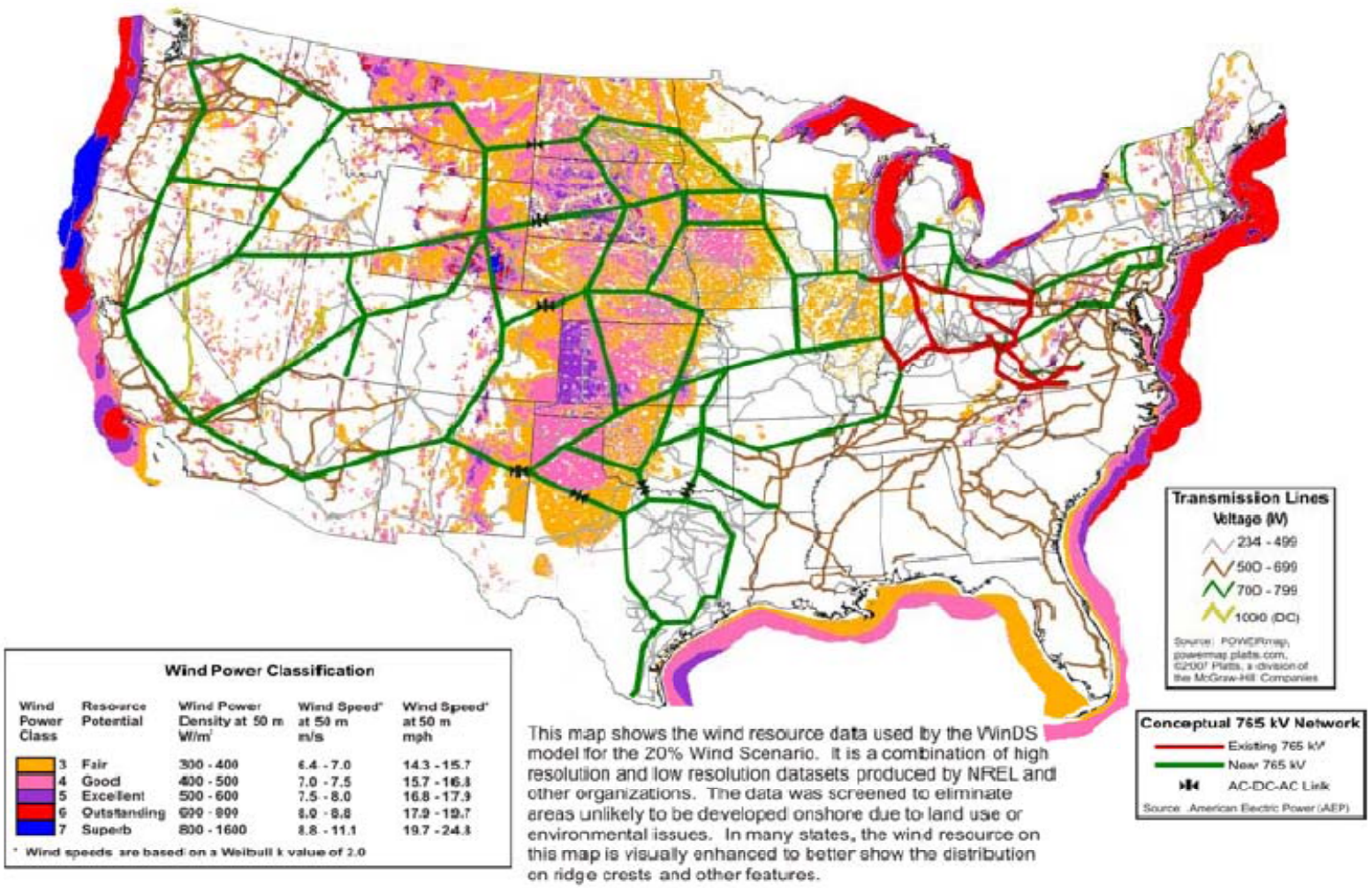
NERC, April 2009

Does the U.S. require an Extra High Voltage Grid?



Secretary Chu 9-21-2009

Figure 1-10. Conceptual transmission plan to accommodate 400 GW of wind energy (AEP 2007)



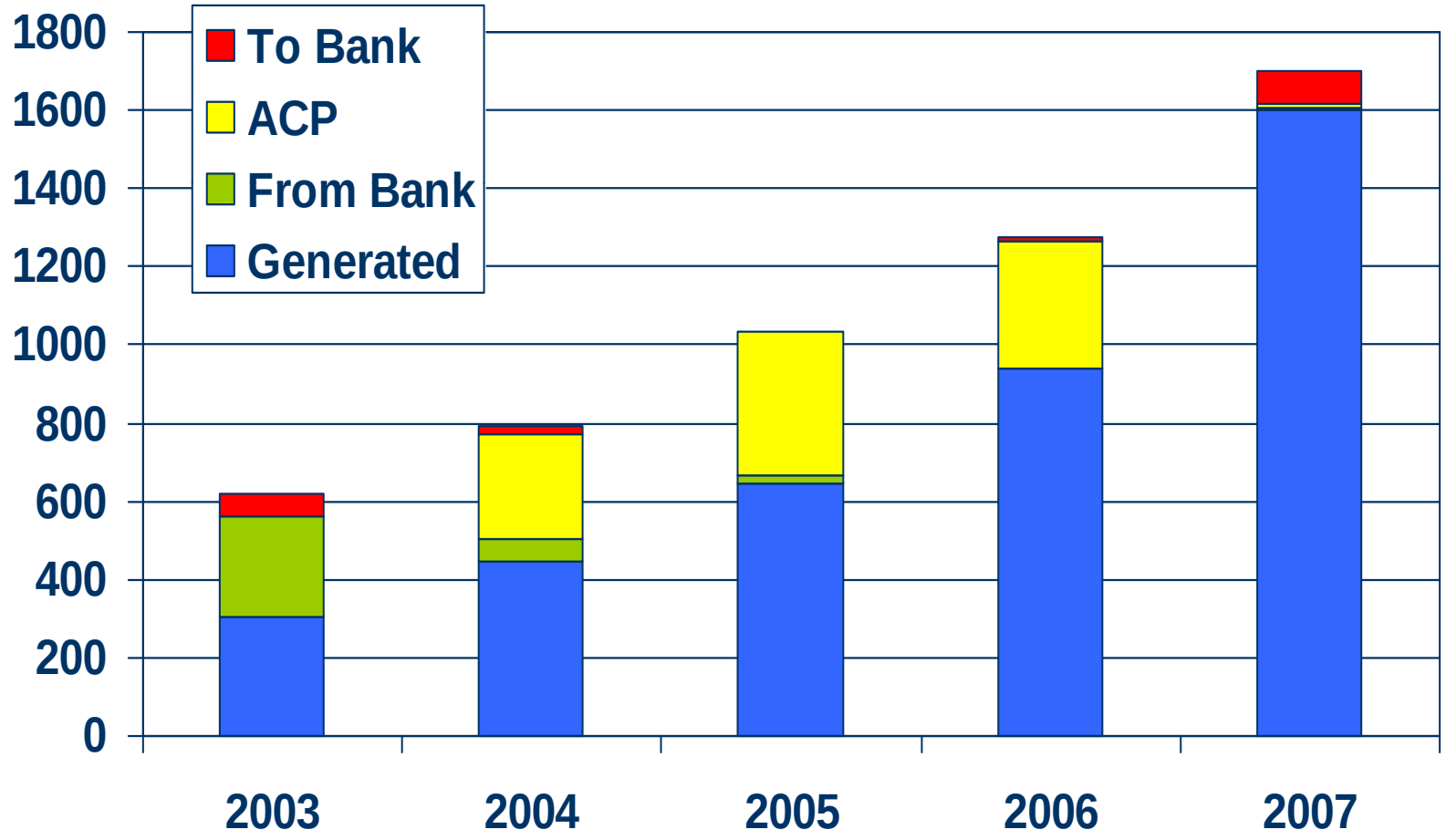
Wind Power Classification

Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m²	Wind Speed* at 50 m m/s	Wind Speed* at 50 m mph
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	800 - 1600	8.8 - 11.1	19.7 - 24.8

* Wind speeds are based on a Weibull k value of 2.0

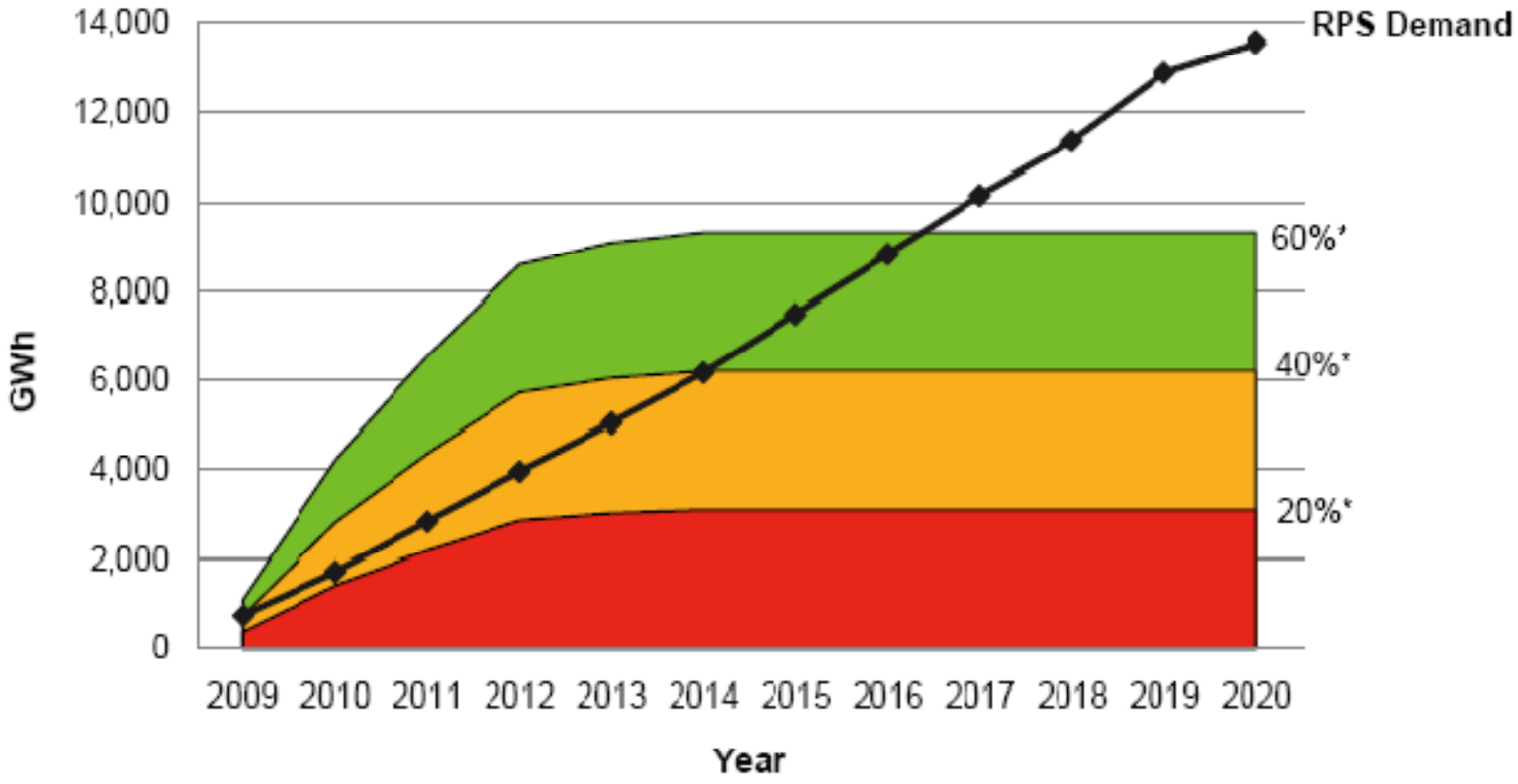
This map shows the wind resource data used by the WinDS model for the 20% Wind Scenario. It is a combination of high resolution and low resolution datasets produced by NREL and other organizations. The data was screened to eliminate areas unlikely to be developed onshore due to land use or environmental issues. In many states, the wind resource on this map is visually enhanced to better show the distribution on ridge crests and other features.

RPS meeting targets



Source: DOER

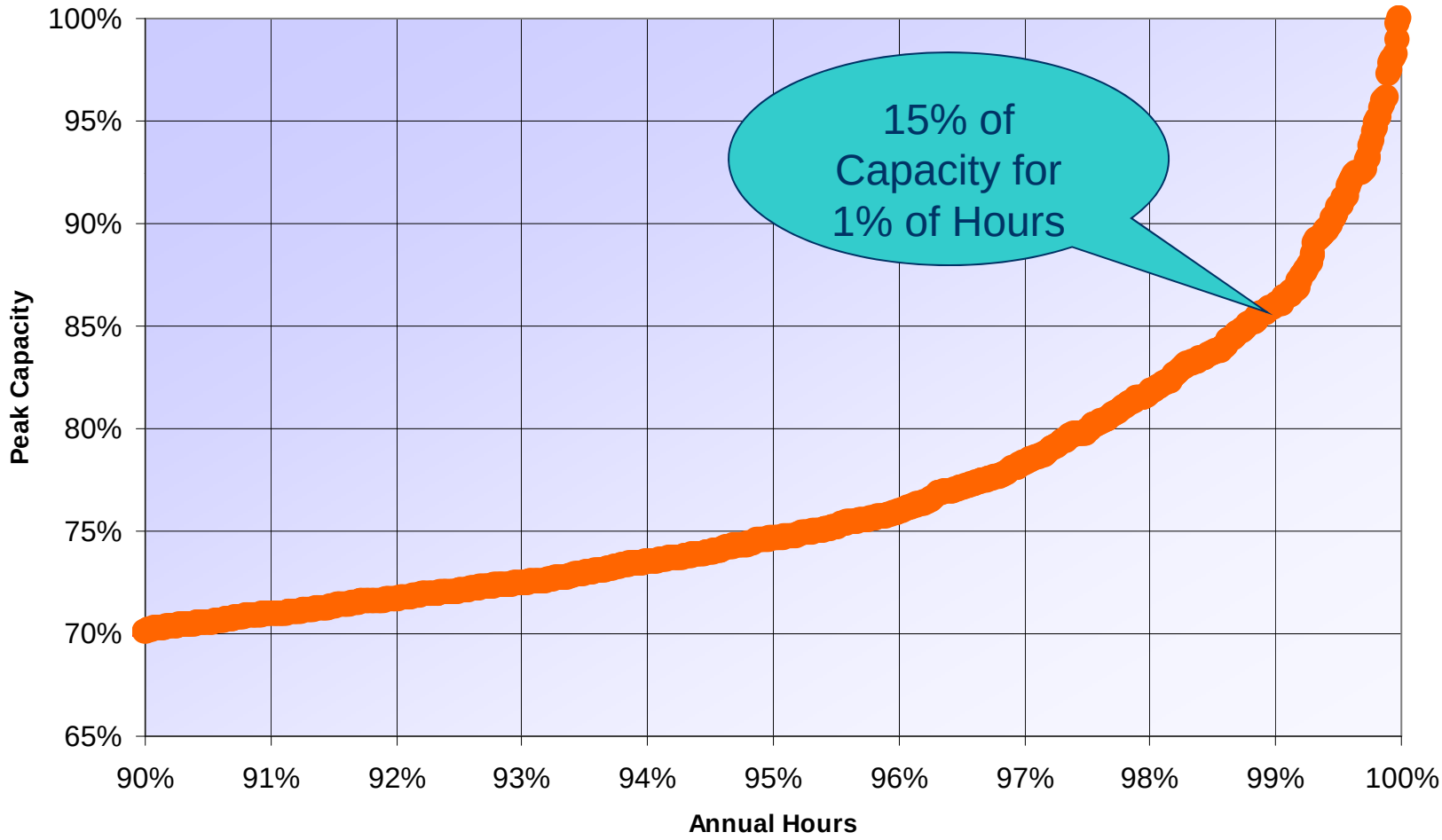
New England RPS Projections



*% of cumulative energy from queue additions

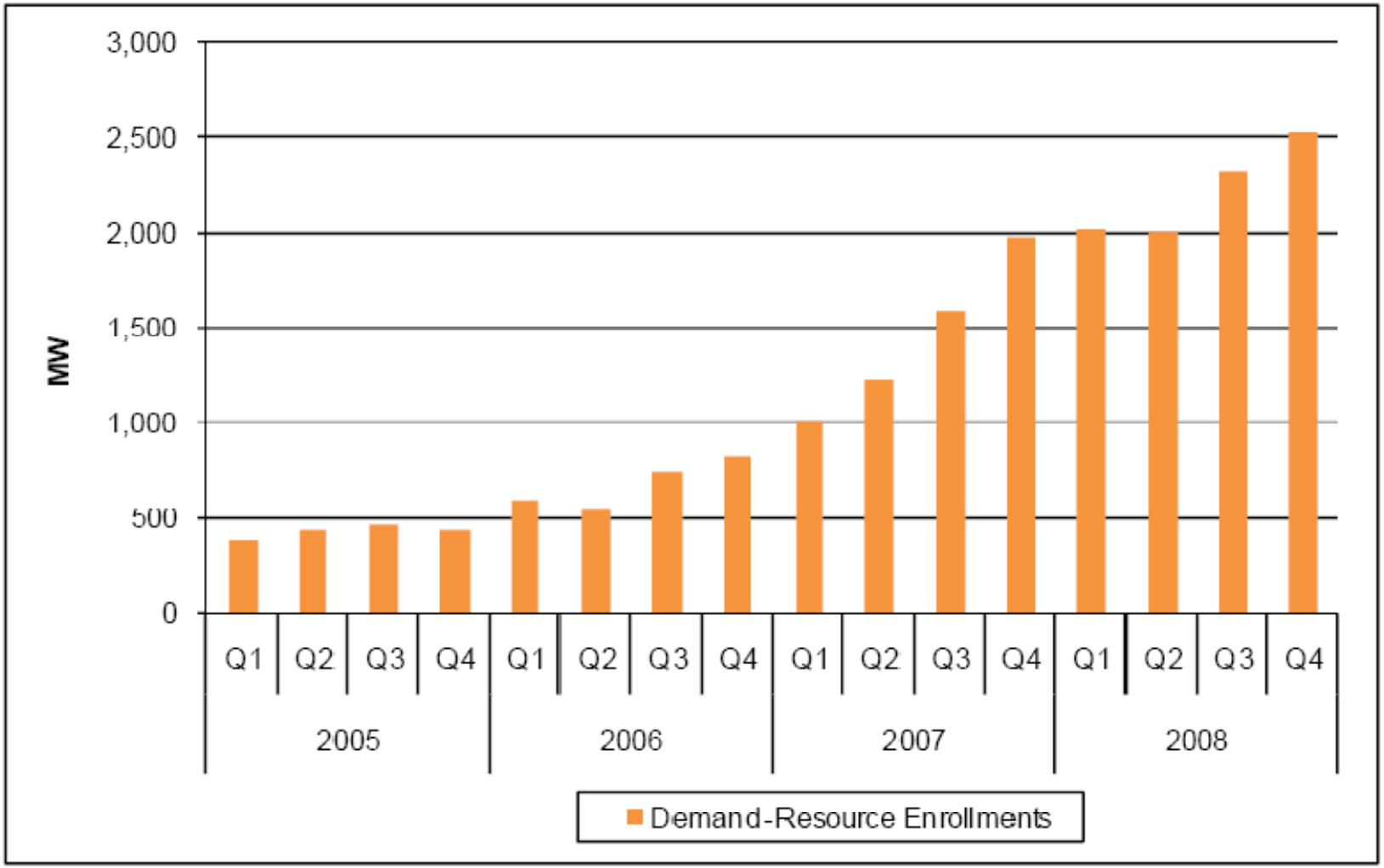
ISO NE RSP 2009

Meeting Peak Demand



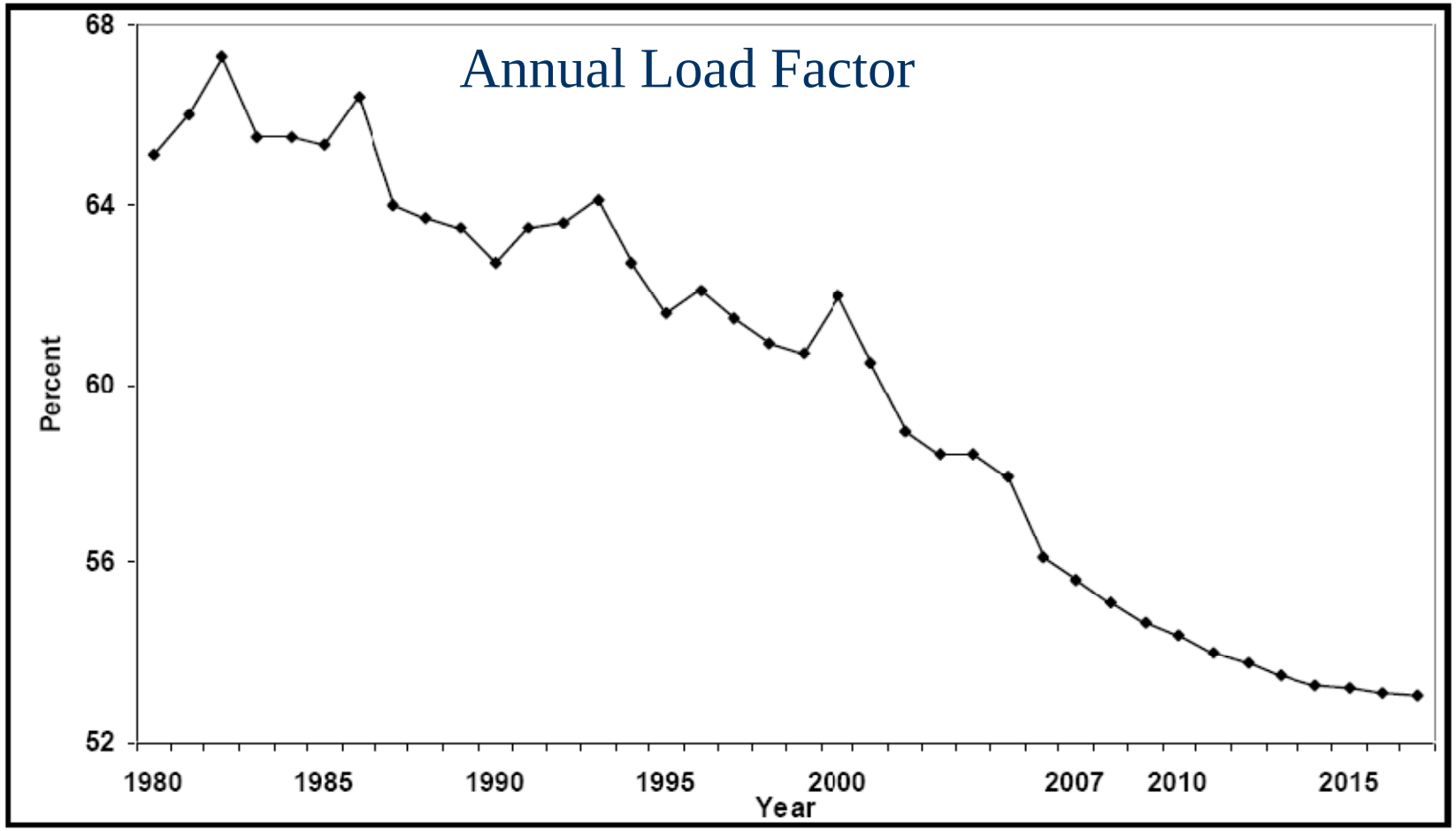
Source: ISO NE 2007 NEMA load zone

DR Significant Resource



ISO NE 2009

Increasingly Peaked



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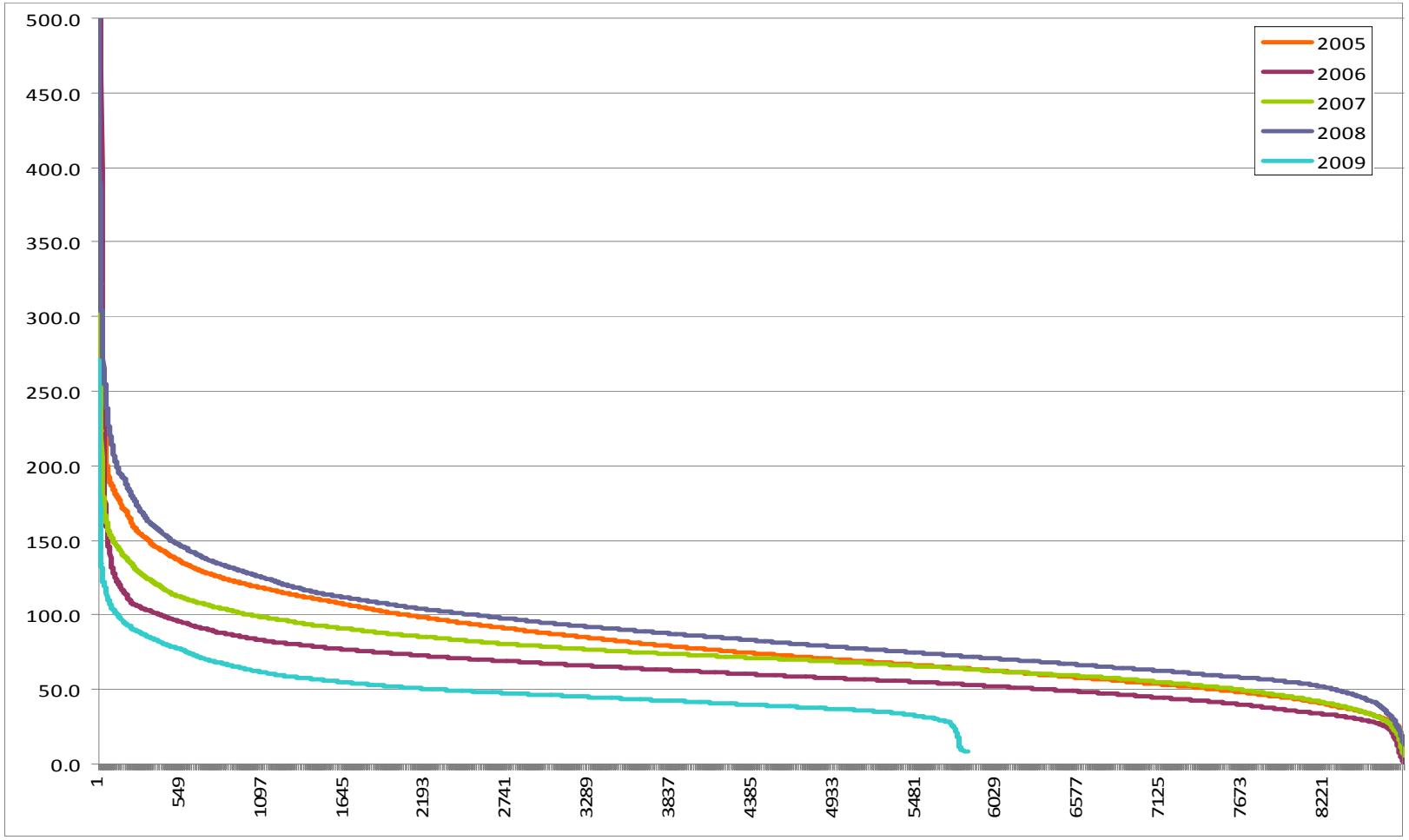
Few High Priced Hours

$ per MWh



Source: ISO NE

MA DOER Mission

Creating a Greener Energy Future
-- economically and environmentally, including:

- Achieving all cost-effective energy efficiencies,
- Maximizing development of greener energy resources,
- Creating and leading implementation of energy strategies to assure reliable supplies and improve relative cost, and
- Supporting clean tech companies and spurring clean energy employment.

Many Policy Levers

Executive

- LBE
- Decoupling
- RGGI
- Renewables
  - PV: 250 MW 2017
  - Wind: 2000 MW 2020
- ZNEB
- Governor's Energy Challenge
- MEPA

Legislation

- Green Jobs
- Ocean Management
- Clean Energy Biofuel
- Global Warming
- Green Communities
  - Building Codes
  - Smart Grid Pilot
  - Least cost Procurement
  - Communities
  - Renewables

Stimulus

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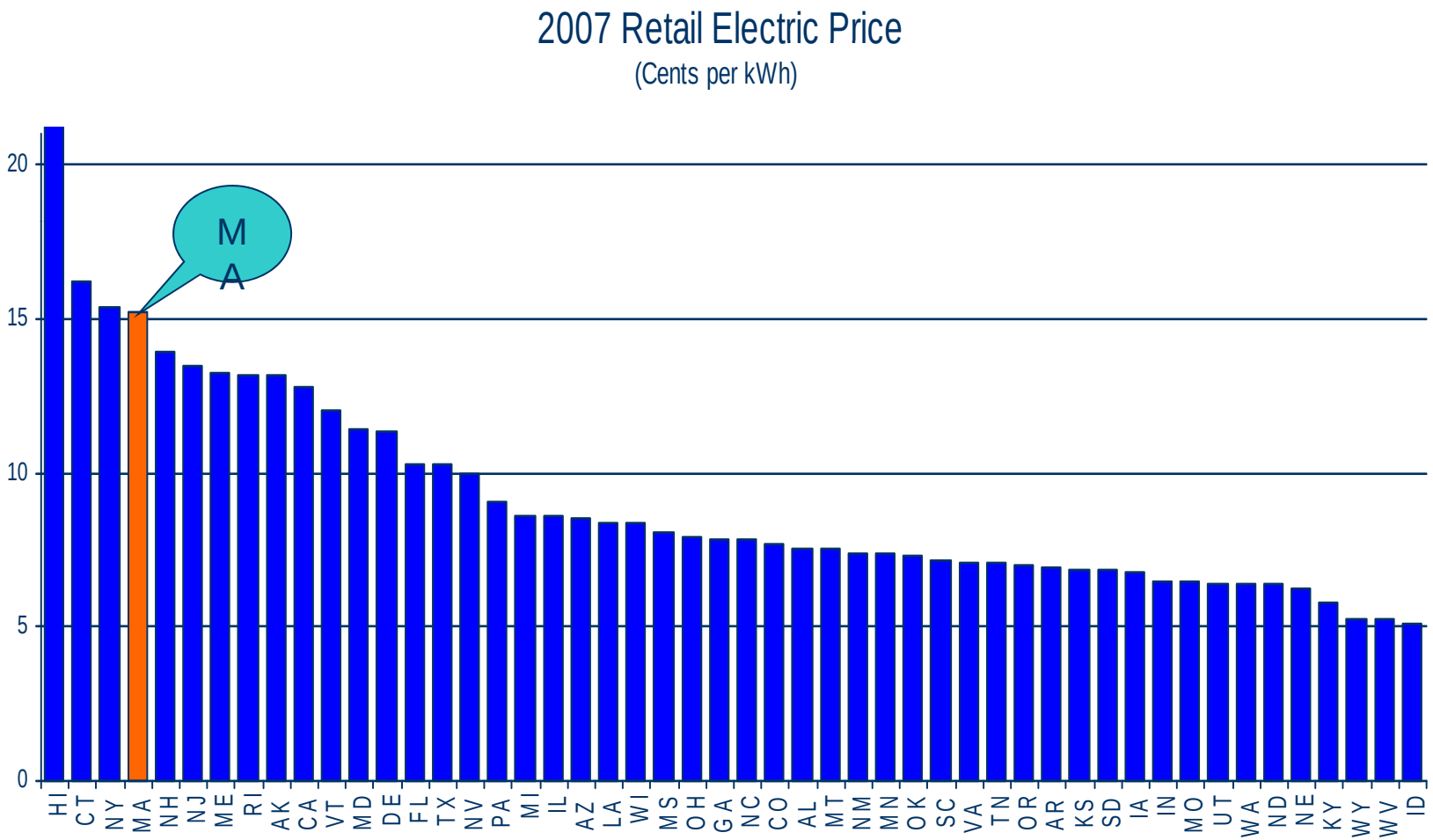
Very high electric prices



Source: EIA Form 826

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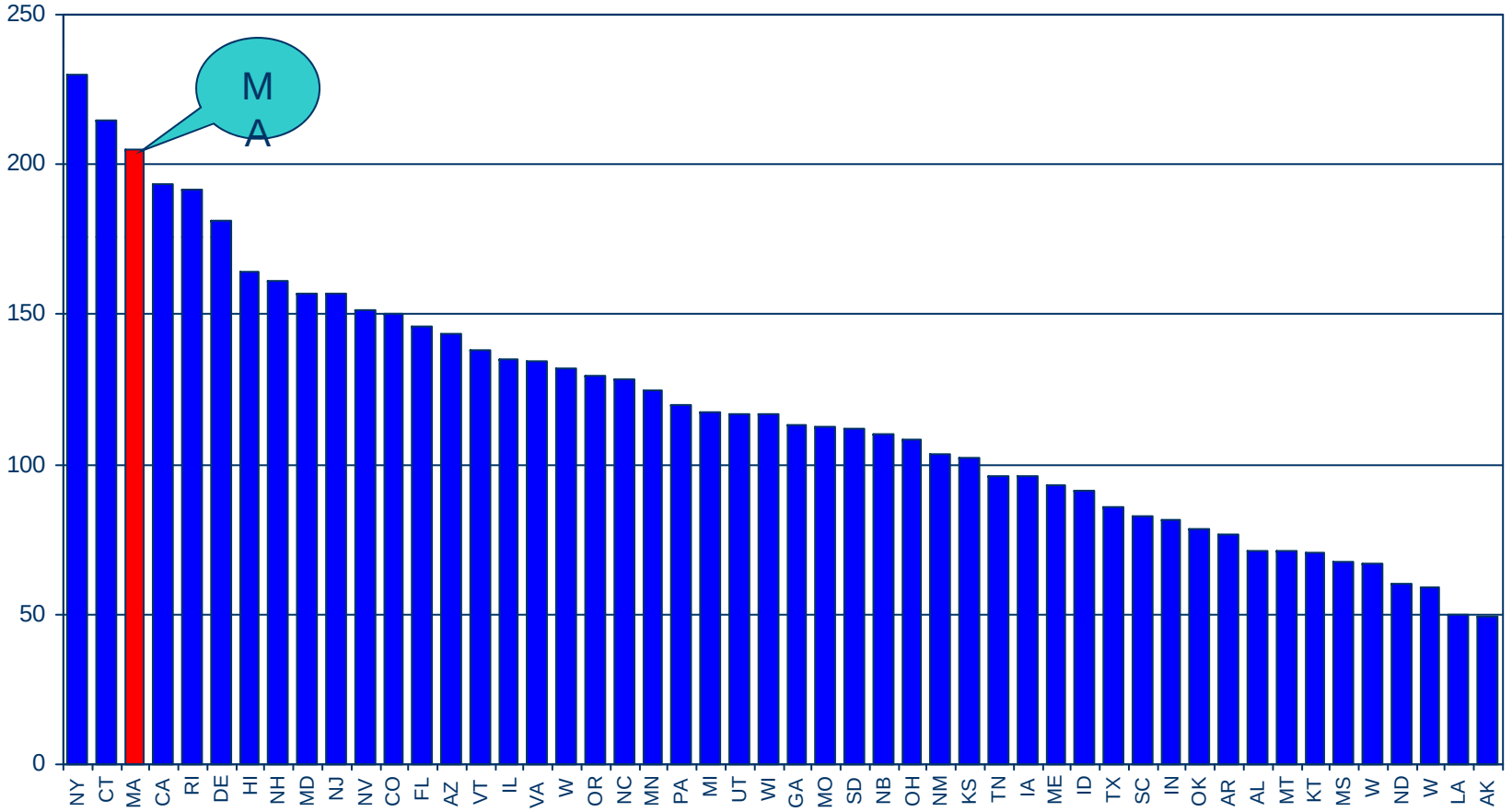
High Energy Productivity



Source: EIA/Census 2005

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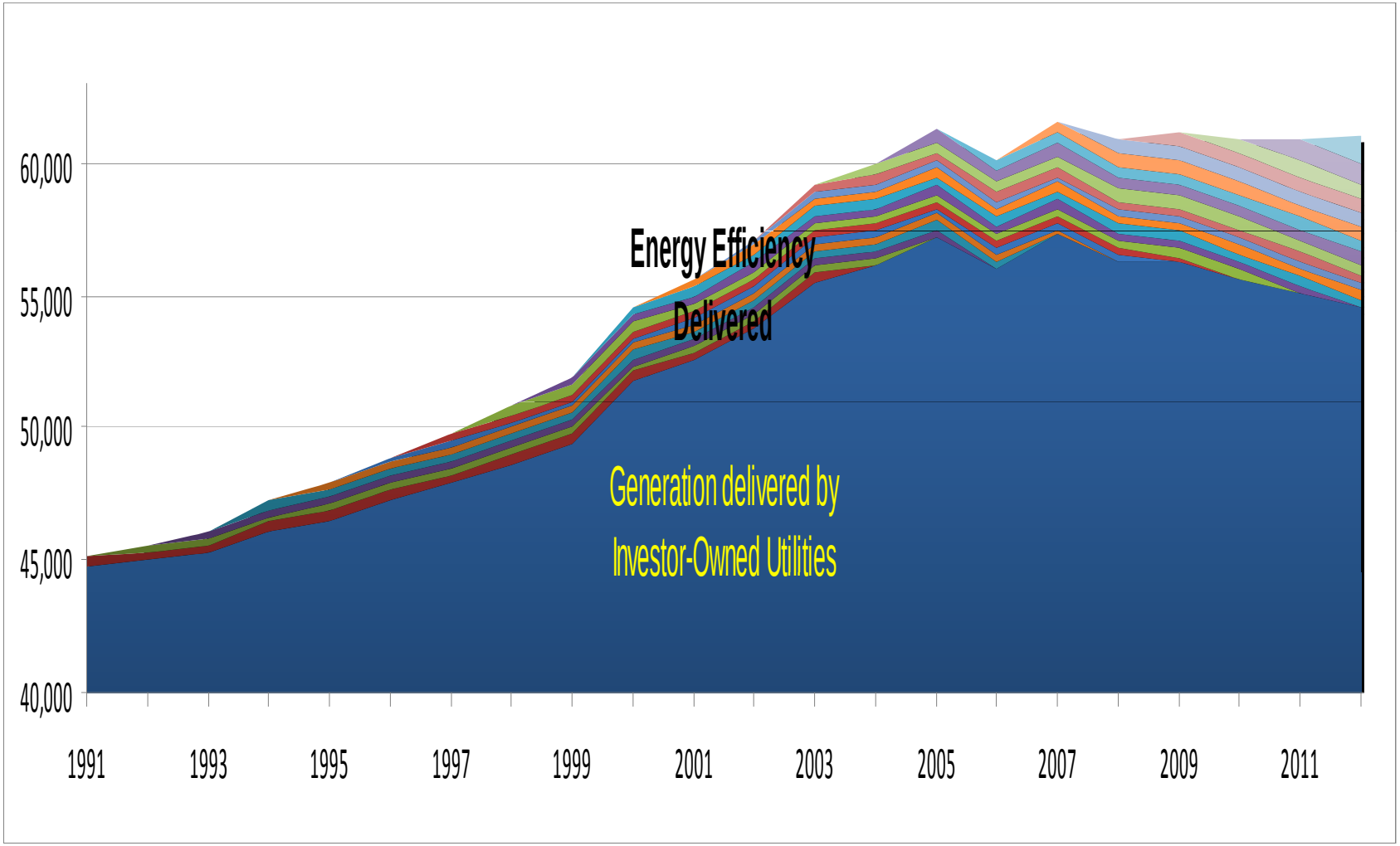
Reducing Energy Waste



Closing thoughts

- Our greener energy future:
  - Getting this right matters
  - Getting it done soon matters
  - Getting it done big matters
- Lots of policy levers need to be pulled in coordination – no simple solutions
- One size does not fit all parts of the country
- States' roles are critical to creating solutions that work -- not road block to overcome
- Regions can work collaboratively
- Market solutions are delivering success