Wind Energy Progress in Massachusetts

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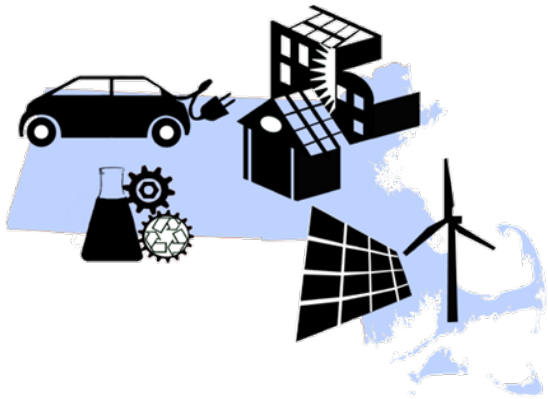
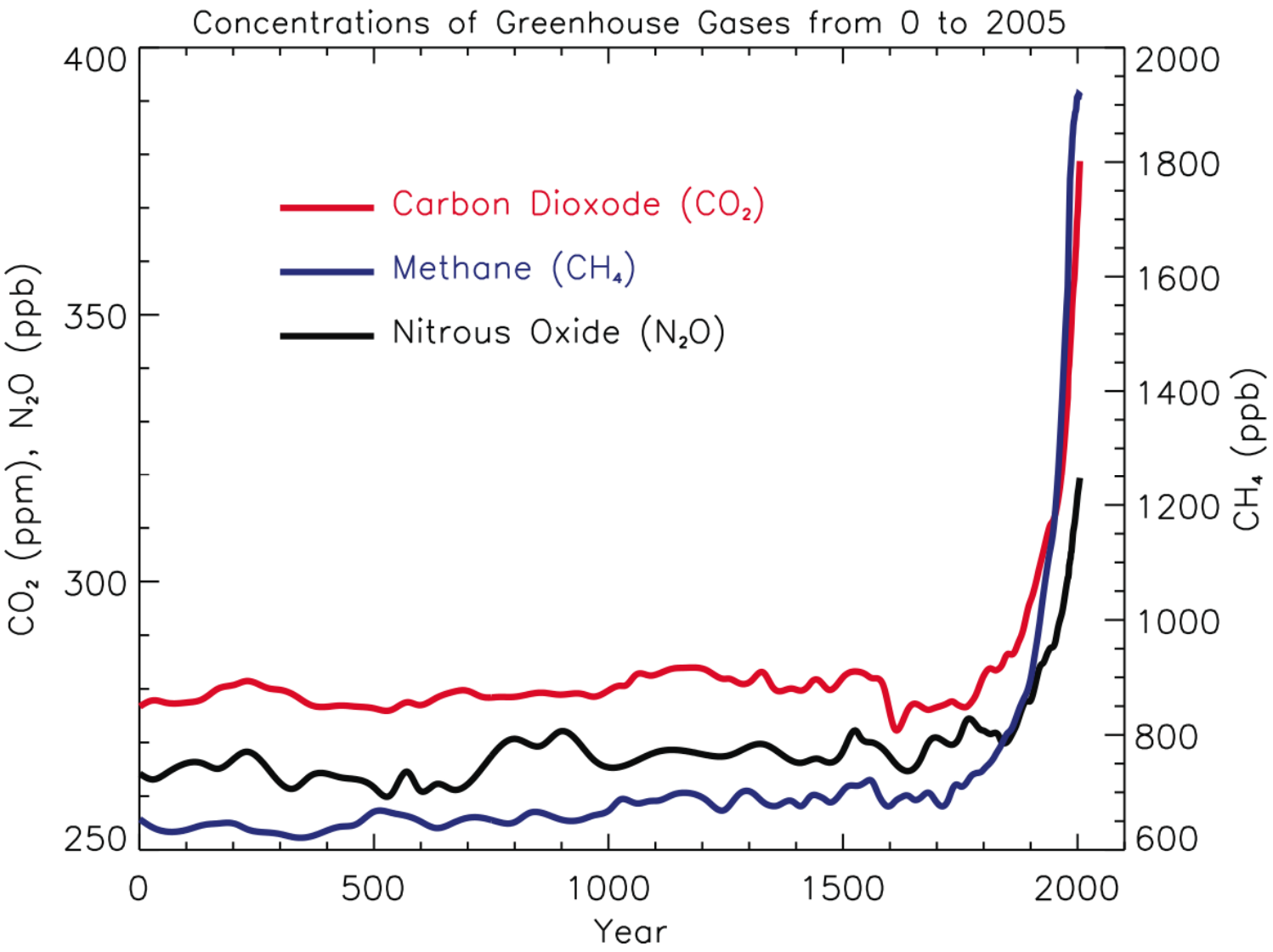


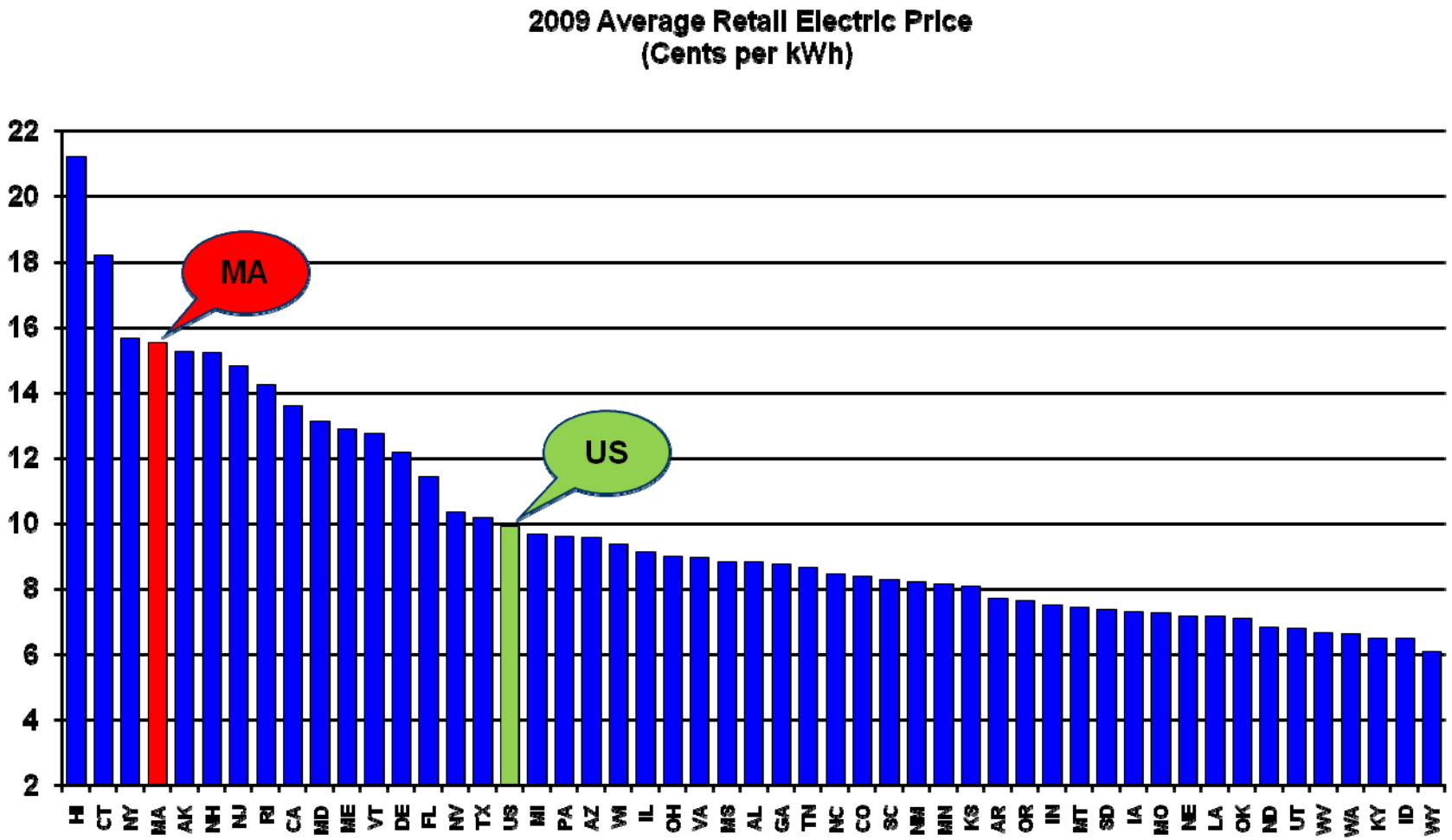
Executive Office of Energy and Environmental Affairs

Why Wind?

- Economic Development
  - Business and Job Creation
  - Tax/Lease Payments
- No Emissions
- No Water Use
- No Toxic Discharge
- No Drilling/Extraction
- Energy Security
- Price Stability

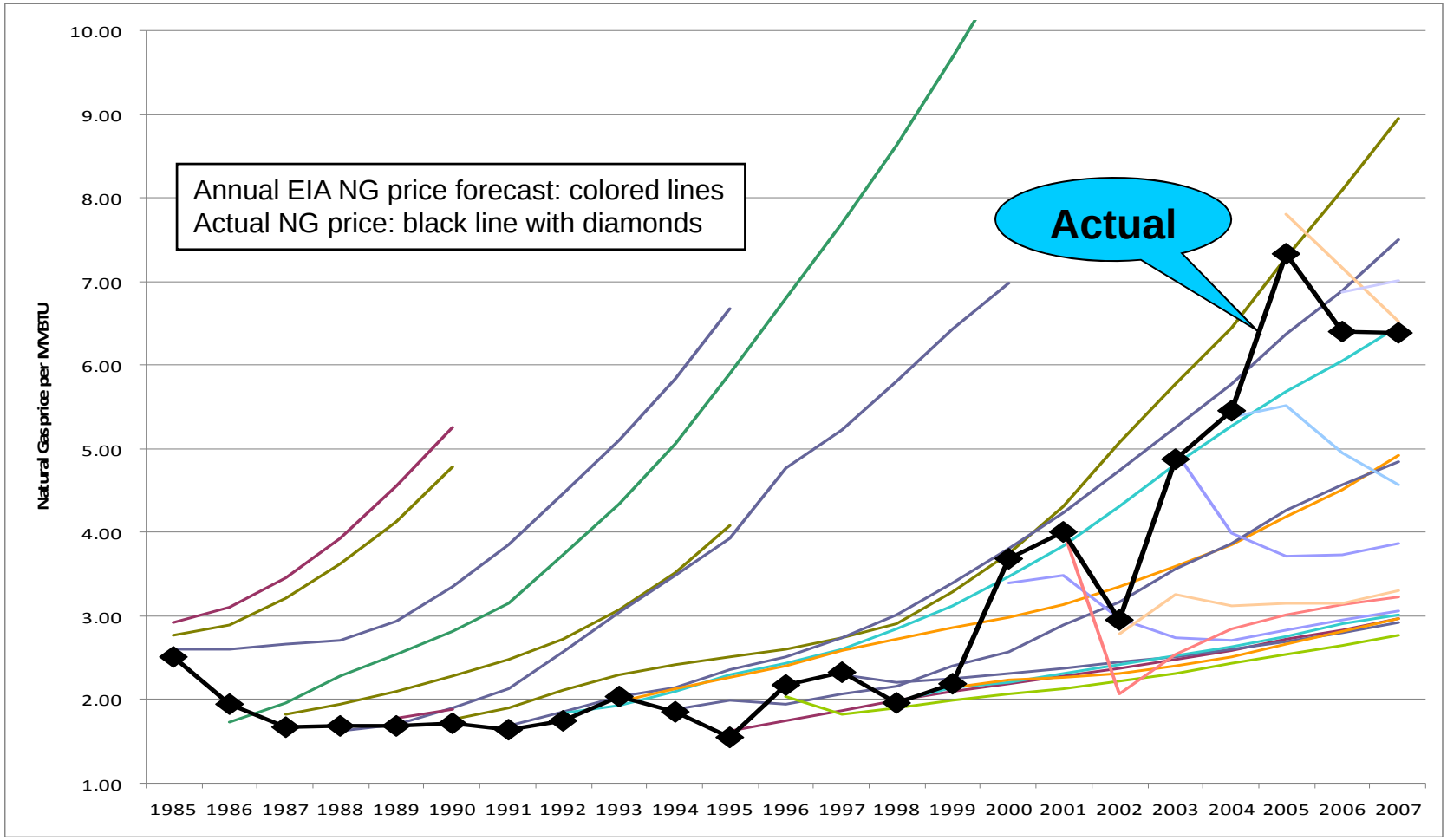

Concentrations of Greenhouse Gases from 0 to 2005
Carbon Dioxode (CO_2)
Methane (CH_4)
Nitrous Oxide (N_2O)
CO_2 (ppm), N_2O (ppb)
CH_4 (ppb)
Year
400
350
300
250
2000
1800
1600
1400
1200
1000
800
600
0
500
1000
1500
2000

MA has High Electricity Prices …



Source: EIA Form 826

Unknowable Future Energy Prices



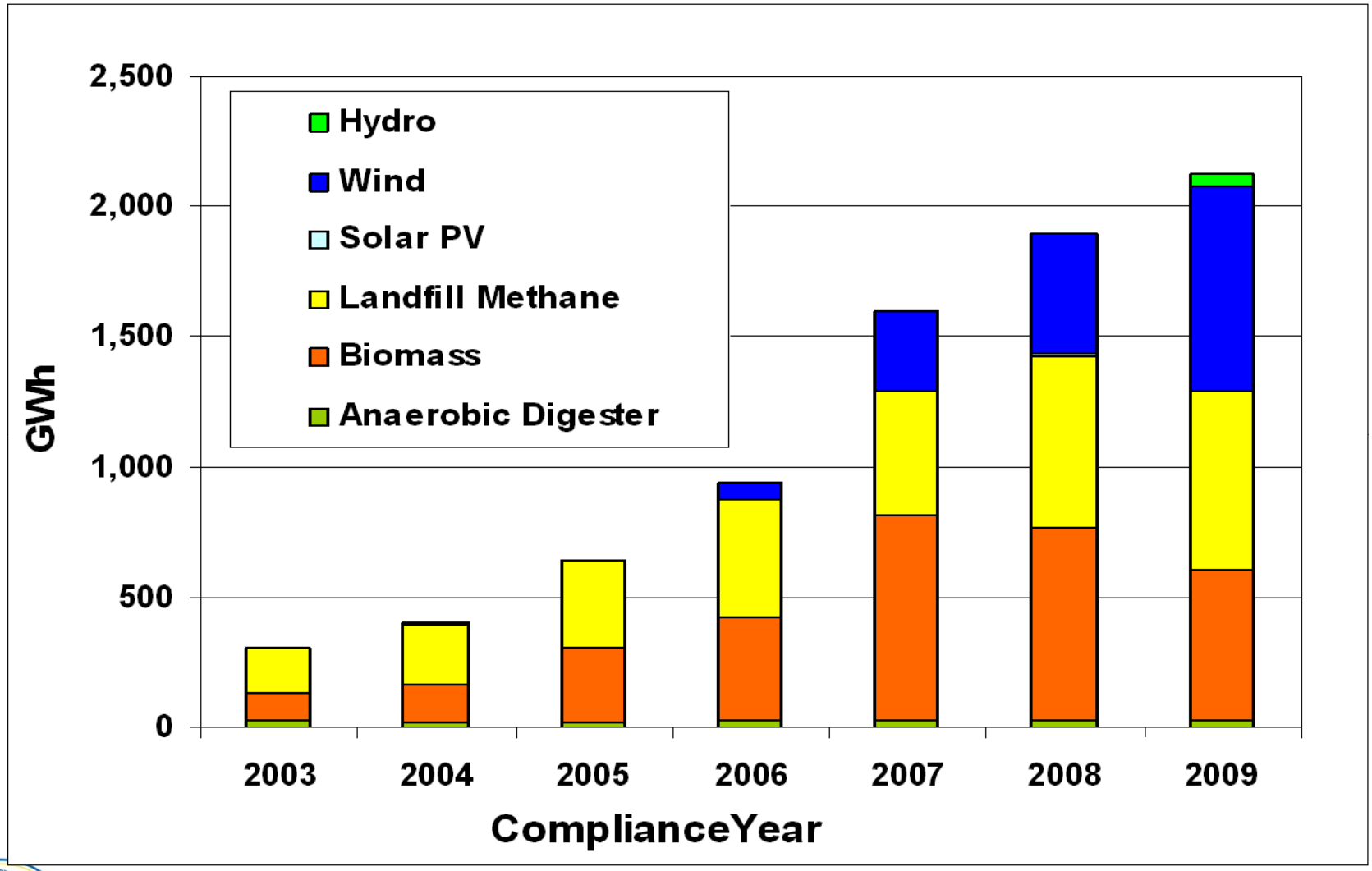
Clean Energy Economic Opportunity

- > 11,000 people in clean energy sector; up 65% since 2007
- Jobs in solar manufacturing, installation and services have doubled since 2007
- Jobs in energy efficiency services have doubled since 2007
- Companies leading the charge: A123; CSG; FloDesign; TPI Composites; Boston Power; Siemens; American Superconductor; Nexamp; First Wind

Clean Energy Legislation 2008

- **Green Communities Act**
  - Expands EE delivery mechanisms and goals
  - RPS – expansion and strengthening targets of 1997 Act
  - Net metering provisions
  - Establishes DOER's Green Communities Program
- **Global Warming Solutions Act**
  - 2020 commitments – 10-25% below 1990 levels
  - 2050 commitments – 80% or more below 1990 levels
- **Oceans Management Act**
  - Provides zoning-like planning of state waters
  - Identifies presumptive areas for wind development
- **Clean Energy Biofuels Act**
  - Mandate for advanced biofuels
  - Paves way for transition to LCFS

MA RPS Class I Technology Trend



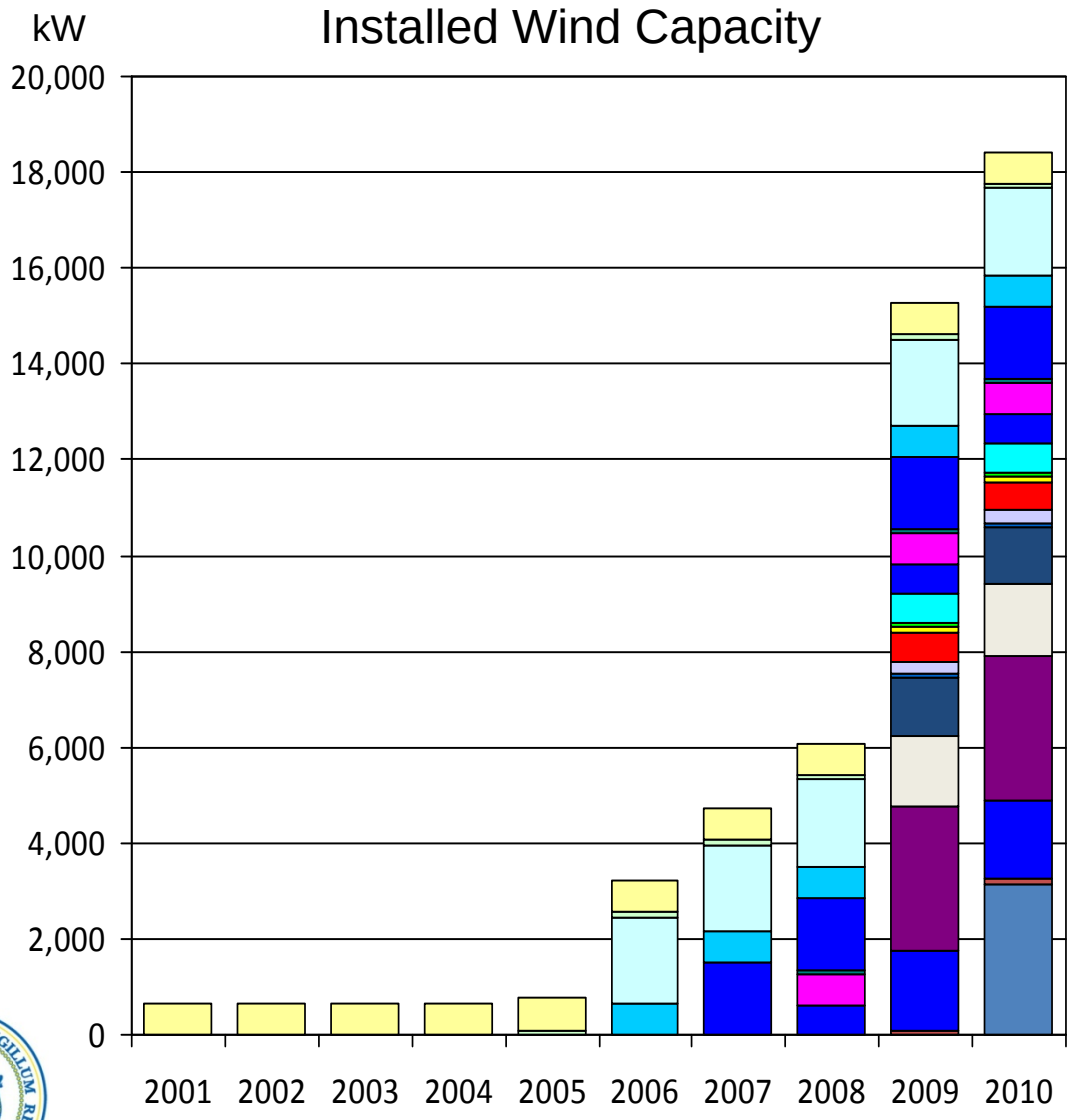
Global Trends

- Global wind energy capacity increased by 22% (35.8 GW) in 2010 - majority of growth in Asia
- 194.4 GW installed globally (up from 158.7 GW last year)
- 2011 a rough year for wind – 5,115 MW installed (half of 2009 installed) but wind approaching cost parity with fossil fuels
- China surpasses US in installed capacity - on track to reach 200 GW by 2020
  - China: 42.3 GW US: 40.1 GW

MA Wind Energy

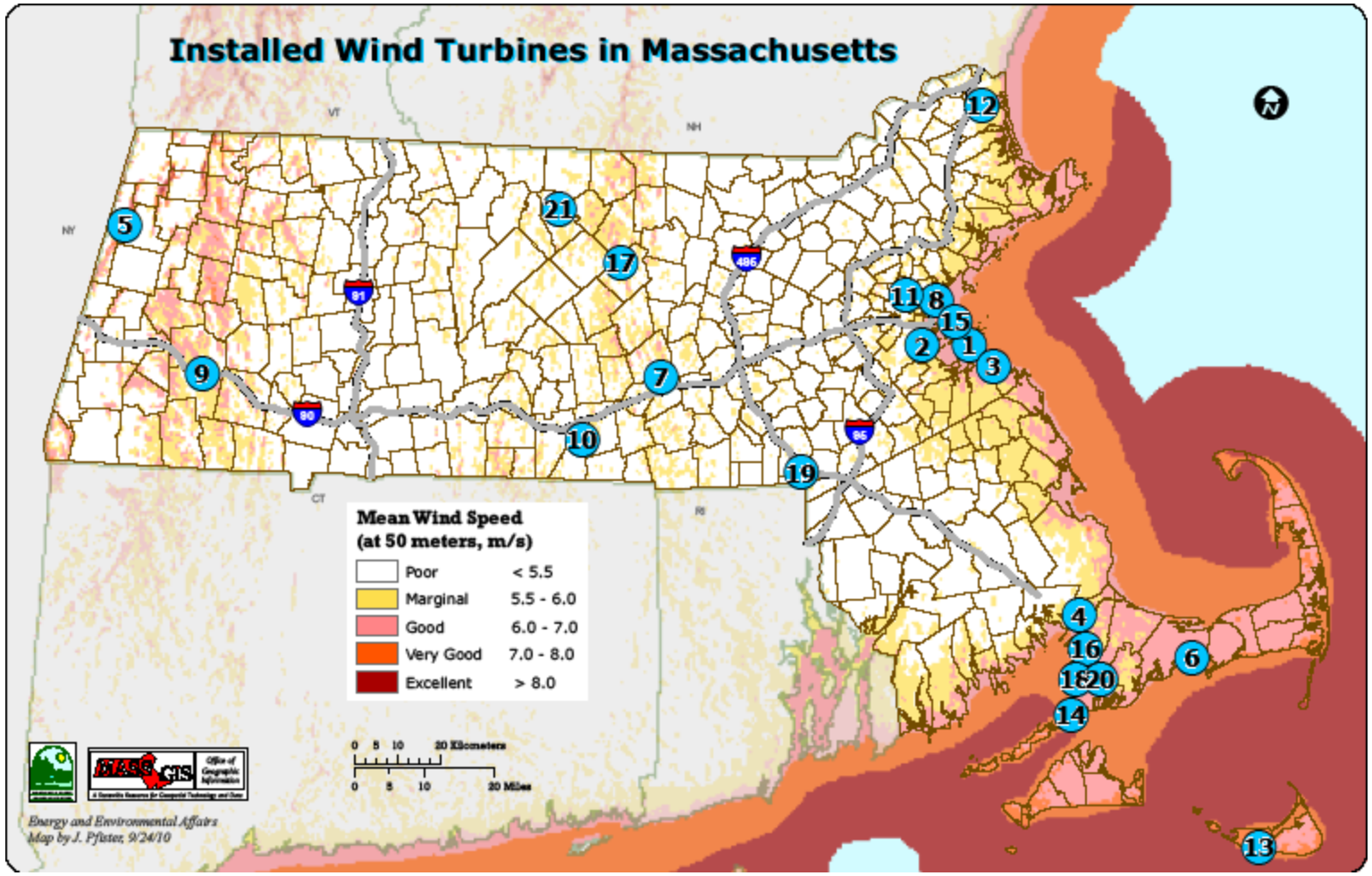
- 10-fold increase in wind – from 3.1 MW to more than 30 MW by end of 2010;
- Building the wind cluster:
  - Wind Blade Test Facility;
  - Cape Wind
  - Vestas R&D
  - Siemens Offshore
  - MassTank/EEW
  - New Bedford Port;
  - FloDesign
  - American Superconductor
  - First Wind

MA Wind Energy Capacity Trend



- 26 turbines Installed
- 18.82 MW of installed capacity
- >30 MW expected to be installed by end of 2010
  - Tenfold increase during Governor Patrick's administration

Massachusetts Installed Projects

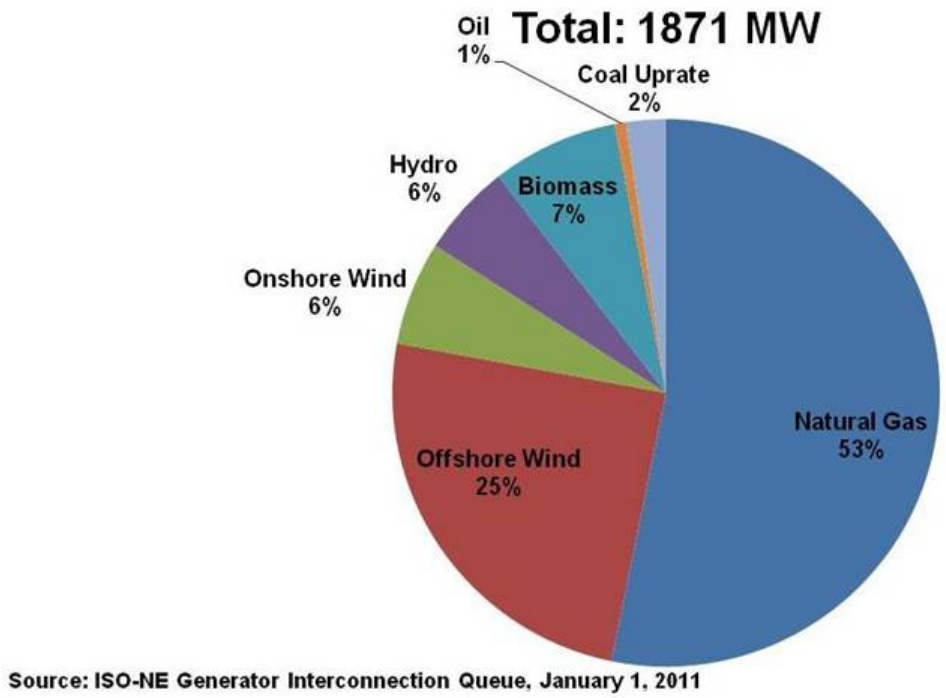


Regional Activity: ISO

- ISO New England completed their 'New England Wind Integration Study' (NEWIS) in 2010
- Primary conclusions:
  - NE could meet up to 24% of energy needs from wind by 2020 (10-12 GW)
  - Increasing amounts of wind energy will require investments in operational capacity (e.g. wind forecasting) and transmission from high wind areas to areas of high load
  - Wind could reduce fossil fueled generation in NE
  - Wind in NE has very healthy capacity factors & values
  - 200 GW of wind energy potential in NE

Regional Activity: ISO

Proposed Resource Development in Massachusetts



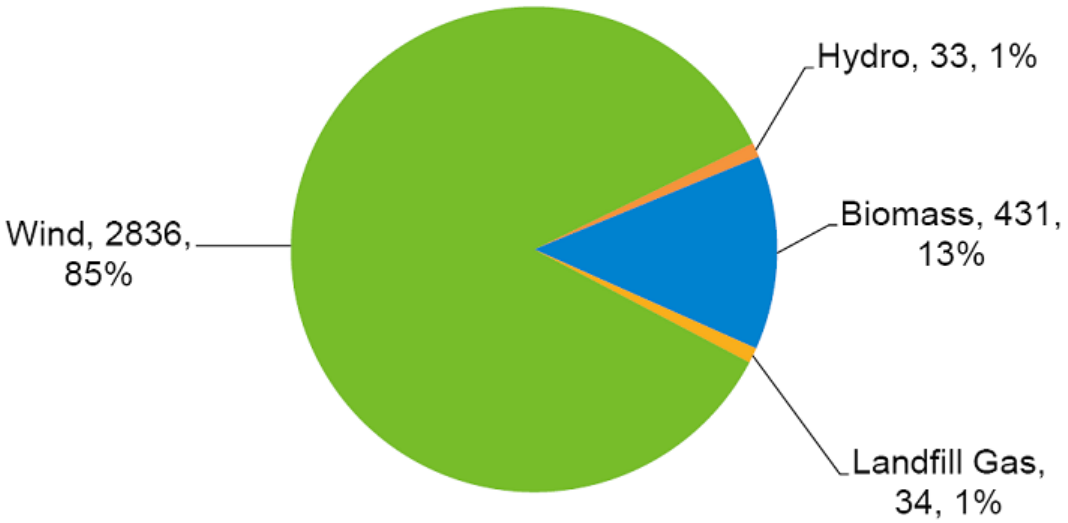
Source: ISO-NE Generator Interconnection Queue, January 1, 2011

Regional Activity: ISO

Renewable Projects Proposed by Fuel Type

+3,300 MW of Renewables in ISO Queue, Wind dominant fuel

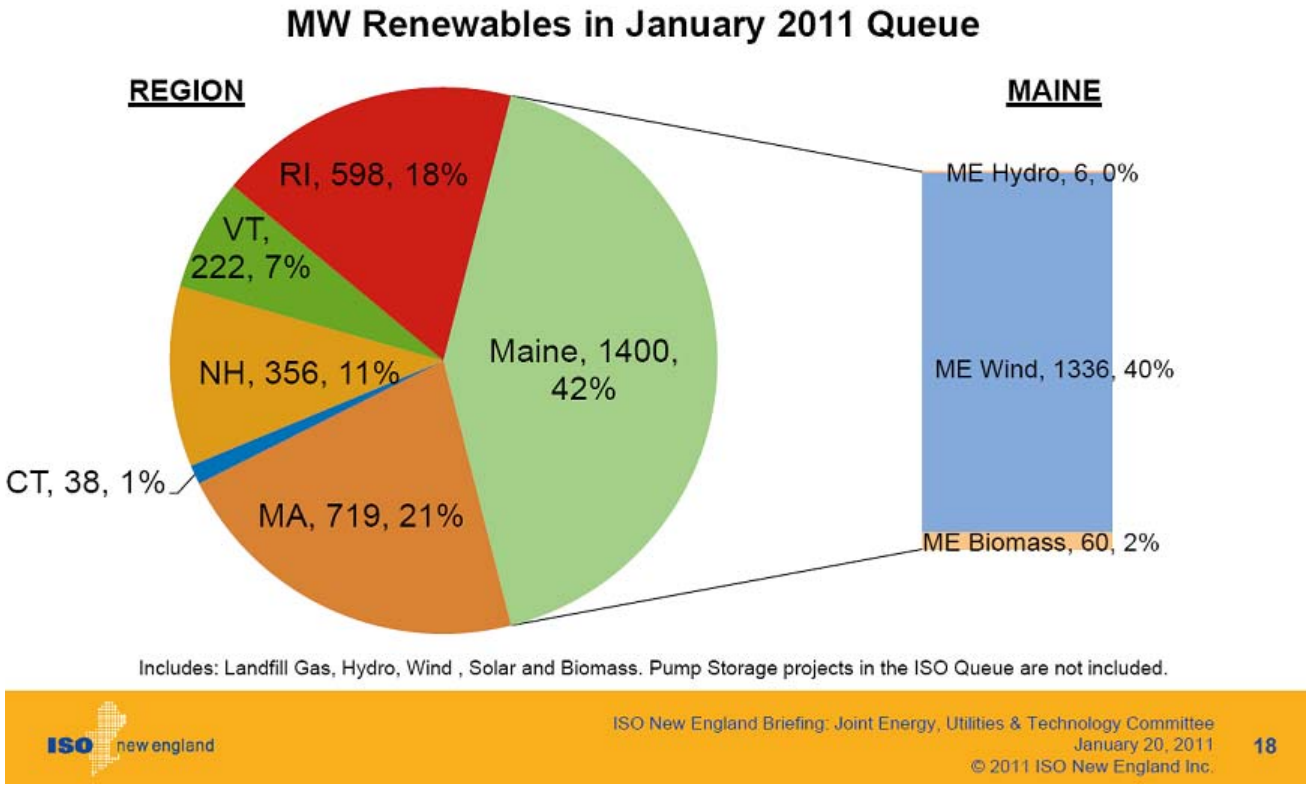
MW Renewables in January 2011 Queue by Fuel Type



Includes: Landfill Gas, Hydro, Wind , Solar and Biomass. Pump Storage projects in the ISO Queue are not included.

Regional Activity: ISO

Renewable Projects Proposed by State



Regional Activity: NEWEEP

- New England Wind Energy Education Project
- Provide siting decision-makers & the public with objective information on which to make informed decisions about proposed wind energy projects throughout New England by:
  - Collect and disseminate accurate, objective, up-to-date information on critical wind energy issues impacting market acceptance of the hundreds of land-based and off-shore wind development projects proposed in the region
  - Enhancing the region's public acceptance of appropriately-sited wind energy generation

Regional Activity: NEWEEP

- Grant Co-applicants:
  - Sustainable Energy Advantage, LLC (SEA)
  - National Renewable Energy Laboratory (NREL)
- NEWEEP is:
  - Coordinated by SEA
  - Directed by a Steering Committee consisting of New England state agencies, regional and national research organizations and New England's regional grid operator, who have committed to participate in the project. Their tasks include:
    - Convening for planning meetings
    - Providing Guidance
    - Planning & Prioritizing
    - Outreach

Steering Committee Members

- National Renewable Energy Laboratory (NREL)
- Connecticut Clean Energy Fund (CCEF)
- Massachusetts Clean Energy Center (CEC)
- University of Massachusetts - Wind Energy Center (WEC)
- Efficiency Maine (EM)
- ISO-New England (ISO-NE)
- Utility Wind Integration Group (UWIG)
- Lawrence Berkeley National Laboratory (LBNL)
- Massachusetts Department of Energy Resources (DOER)
- Clean Energy States Alliance (CESA)
- New Hampshire Office of Energy & Planning (OEP)
- Renewable Energy New England (RENEW)*
  - An organization consisting of environmental advocates & wind businesses

Regional Activity: NEWEEP

- 2-year project through Dec 2011
- 8 free webinars open to public
- Full-day, in-person Conference (June 2011)
- Outreach/Awareness
  - Web-based home for webinar-related materials – the New England Wind Forum (NEWF)

http://www.windpoweringamerica.gov/newengland/neweep/

MA Wind Initiatives

- Policy
  - Commonwealth Wind Goals: 2000 MW by 2020
  - RPS (Renewable Energy Portfolio Standard)
  - LTC (Long term contracts)
  - Wind Energy Siting Reform Act
    - Refiled in 2011
  - Net Metering
  - Interconnection

MA Wind Initiatives

- Public Outreach/Awareness
  - Environmental Business Council (EBC)
  - New England Wind Energy Education Project (NEWEEP)
  - MA Wind Working Group
  - New England Clean Energy Council
  - Cape & Islands Wind Information Network
- Technical Assistance
  - MA Clean Energy Center (CEC)
  - Green Communities
  - MassGIS Wind Viewer

Wind Energy Siting Reform Act

- Re-filed January 2011 and same as bill passed (but not enacted) in 2010
- Misinformation about wind energy rife in MA
- Consistent and scientifically accurate and robust siting standards are critical to wind energy development in MA
- State will continue to play an active and vital role developing wind energy siting standards and educating stakeholders

Net Metering

- Changes made via the Fall 2010 supp. Anticipate DPU to open a docket in very near future with a revised draft regulation to implement these changes:
  - Separate caps for public (2%) and private (1%)
  - New definition of a public NM facility (owned or operated or 100% of output assigned to municipality or other governmental entity)
  - Aggregated cap for public entities of 10 MW
  - DPU create a process for public projects to provide assurance of nm status

Interconnection

- Opportunities to develop more efficient, consistent, and faster process
- Increasingly high volume of DG applications
- Enhance awareness and education regarding interconnection process
- Prevent miscommunication and mishaps that can delay projects and increase project costs

Social Acceptance

- Common cited concerns
  - Health effects
    - Sound, Flicker, Wind Turbine Syndrome
  - Property values
    - December 2009 Lawrence Berkeley National Lab study
  - Cost
    - Subsidies, increased cost
  - Visibility
  - Popularity
    - September 2010 Financial Times/Harris Poll

      87% in US favor new wind farms

State Resources

- MASSACHUSETTS CLEAN ENERGY CENTER (CEC)
  - Commonwealth Wind Program
    - 617-315-9355
    - www.masscec.com
- MASSACHUSETTS DEPARTMENT OF ENERGY RESOURCES (DOER)
    - http://www.mass.gov/energy/wind
- MASSGIS WIND VIEWER
  - http://maps.massgis.state.ma.us/wind/

Suggestions?

- MA will continue to be a global and national leader - lets continue the momentum
- This will require leadership, vision, persistence, and compelling communication & outreach
- The opportunity is large, but time is limited
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