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Nexus Perspectives: Water, Energy, and Climate

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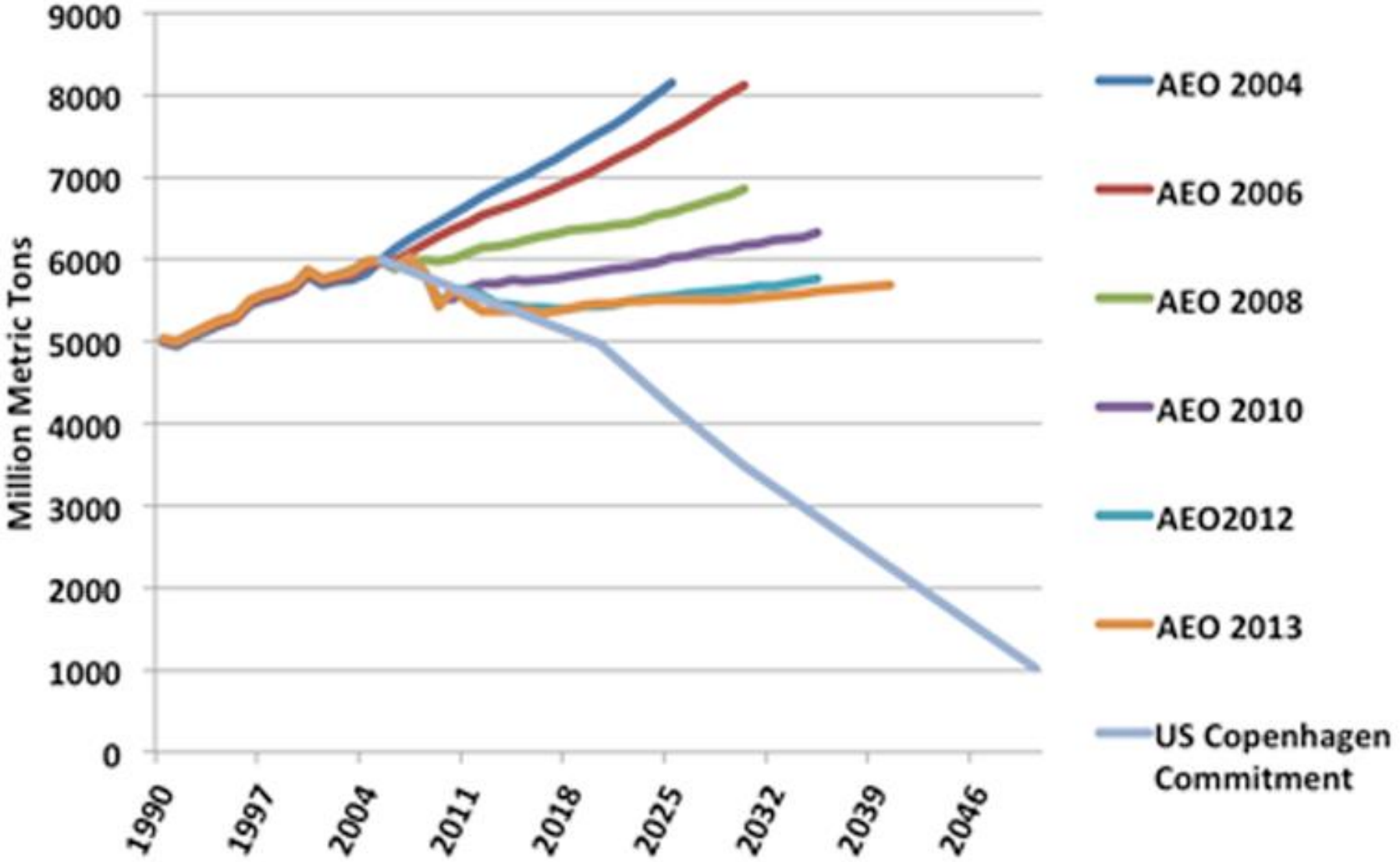
Forecasts for CO2 Energy Emissions

(From EIA Projections and U.S. Copenhagen Commitment)



Source: Green Grok
blogs.nicholas.duke.edu/thegreengrok

U.S. Energy Sector Risks
(regulator and/or utility perspective)

- Retiring coal
- Defaulting to gas
  - Concerns about volatility
- Regulatory uncertainty
- Potential nuclear retirements
- Uncertain demand growth
- High capital expenditures
- Intermittent renewable generation (rooftop solar)
- CO_2 regulations
- Infrastructure planning for drought and extreme weather

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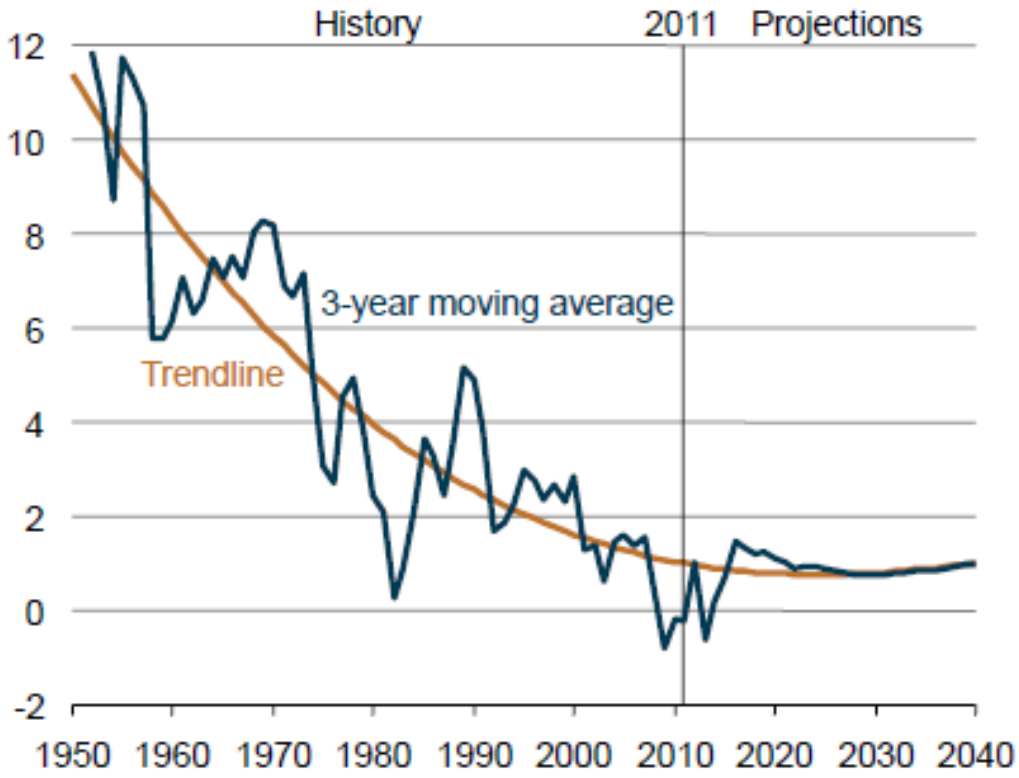
Low Demand Growth

Figure 75. U.S. electricity demand growth, 1950-2040 (percent, 3-year moving average)



Source: EIA Annual Energy Outlook 2013

Risk Mitigation Strategies

- Demand response/energy efficiency
  - Delay major capital investments
- Dynamic pricing, smart grid options
- Renewable generation
- New/emerging technology
- New nuclear(?)
- Increased dispatch of existing coal

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GHG regulation under the Clean Air Act

- Power sector performance standards
  - Flexible statutory language
    - E.g., “best system of emission reduction”
  - Limited precedent
  - Important role for the states
    - Laboratories for effective policies

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GHG Reduction Strategies

- Energy efficiency
- Renewable energy
- Emission averaging/trading
- Biomass co-firing
- Retire high emitting facilities
- New technologies

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Electricity sector risk

- Demand response/energy efficiency
- Dynamic pricing, smart grid options
- Renewable generation
- New/emerging technology
- New nuclear(?)
- Increased dispatch of existing coal

Power sector GHG reductions

- Energy efficiency
- Renewable energy
- Emission averaging/trading
- Biomass co-firing
- Retire high emitting facilities
- New/emerging technologies
- New nuclear (?)

Multi-benefits

Electricity sector risk

- Demand response/energy efficiency
- Dynamic pricing, smart grid options
- Renewable generation
- New/emerging technology
- New nuclear(?)
- Increased dispatch of existing coal

Power sector GHG reductions

- Energy efficiency/reduce demand
- Renewable energy
- Emission averaging/trading
- Biomass co-firing
- Retire high emitting facilities
- New/emerging technologies
- New nuclear (?)

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Water Risk?

- Options for a systems approach?

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Thank You

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