REINHOLD ENVIRONMENTAL Ltd.

2012 APC Round Table & Expo Presentation

July 16-17, 2012, in Baltimore, MD / Hosted by Duke Energy, Entergy, FirstEnergy, Southern Company & TVA

Is There A Future For Coal ?

2012 APC/PCUG Conference

Robert G. Hilton

July 16, 2012

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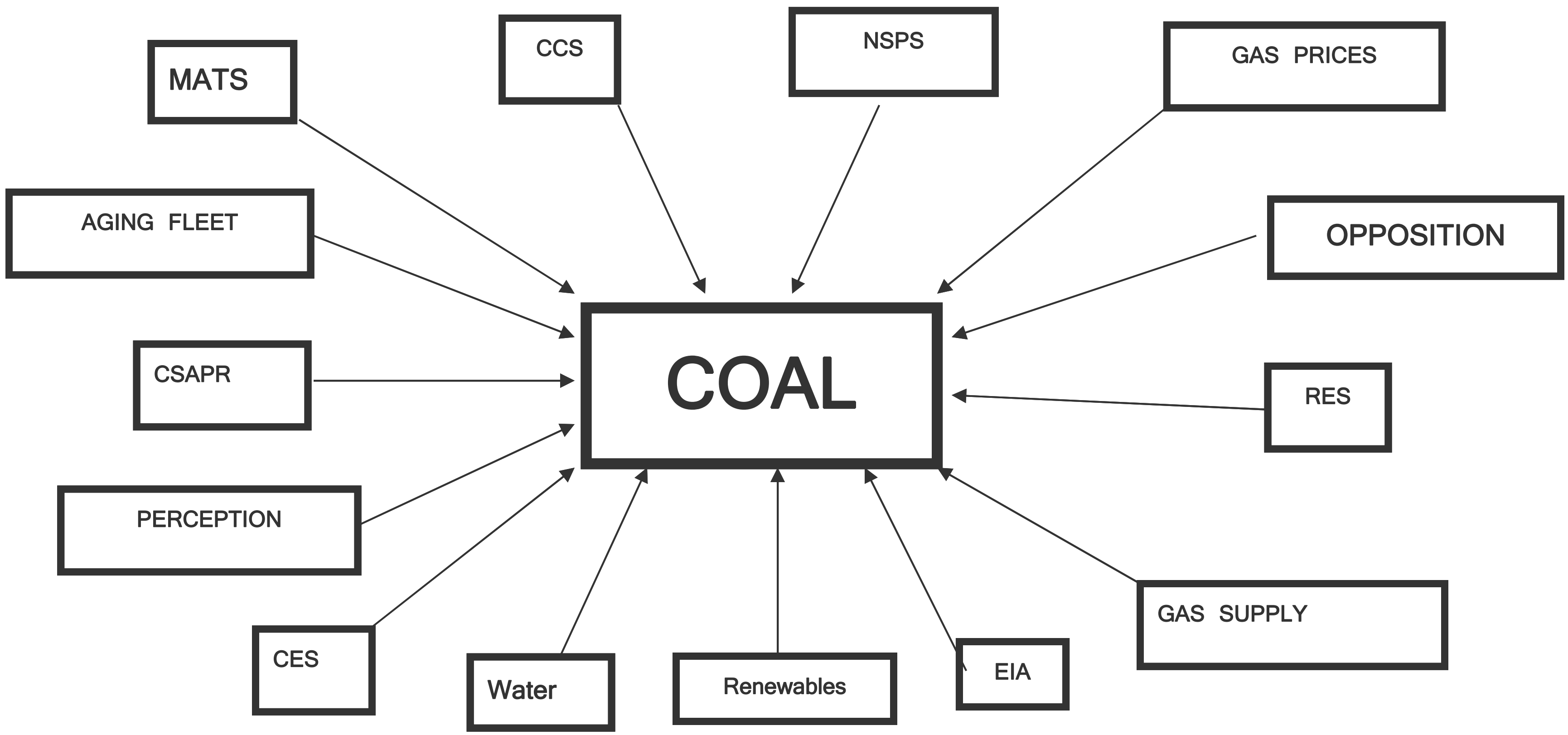
The Dilemma for Coal in the US



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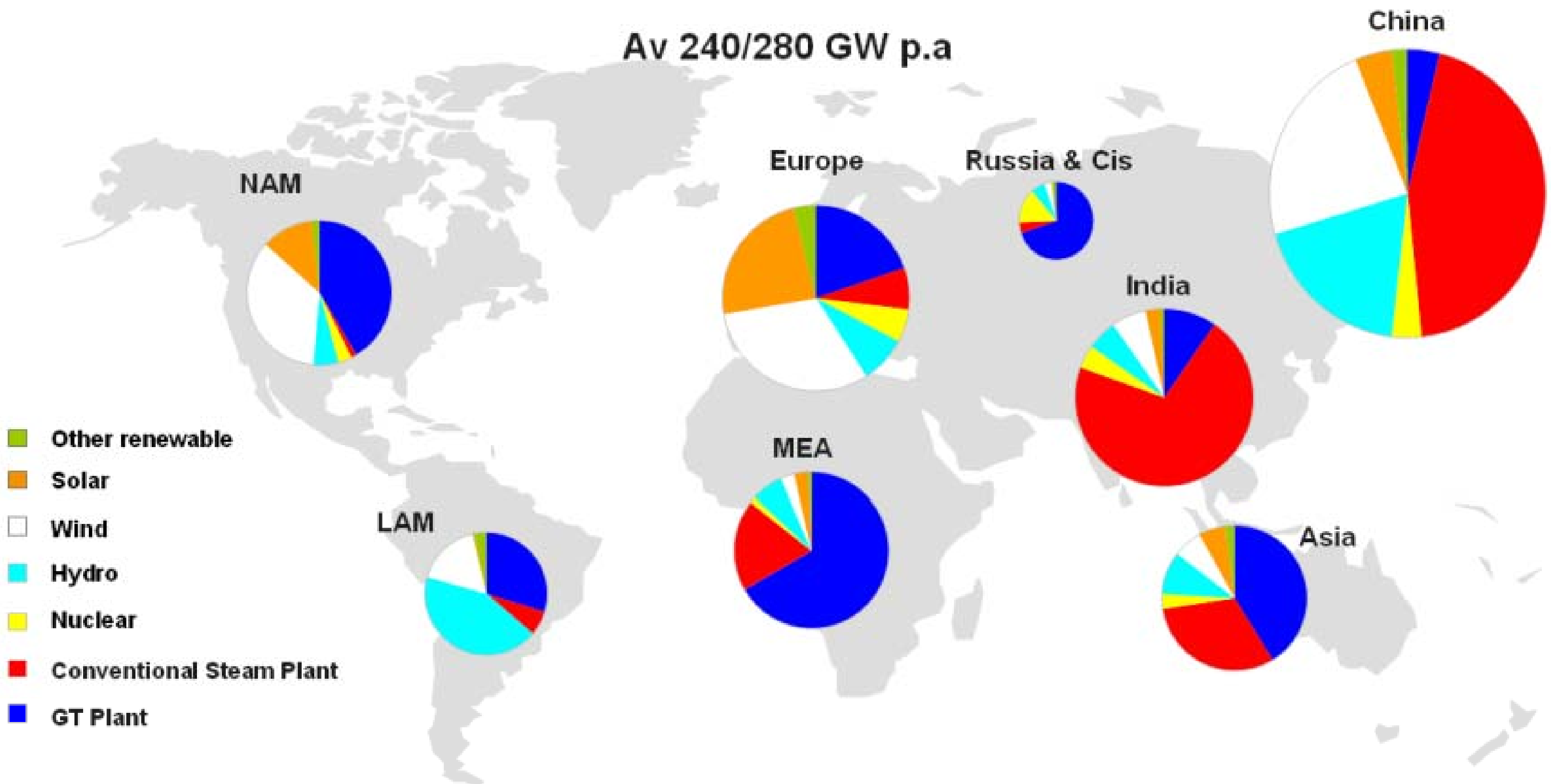
Global power market forecast – next 5 years
New Power Plant Orders in GW p.a



Source: ALSTOM MACA 2011

✓Biggest demand in emerging economies
✓Growing share of CO2-free all across the globe.

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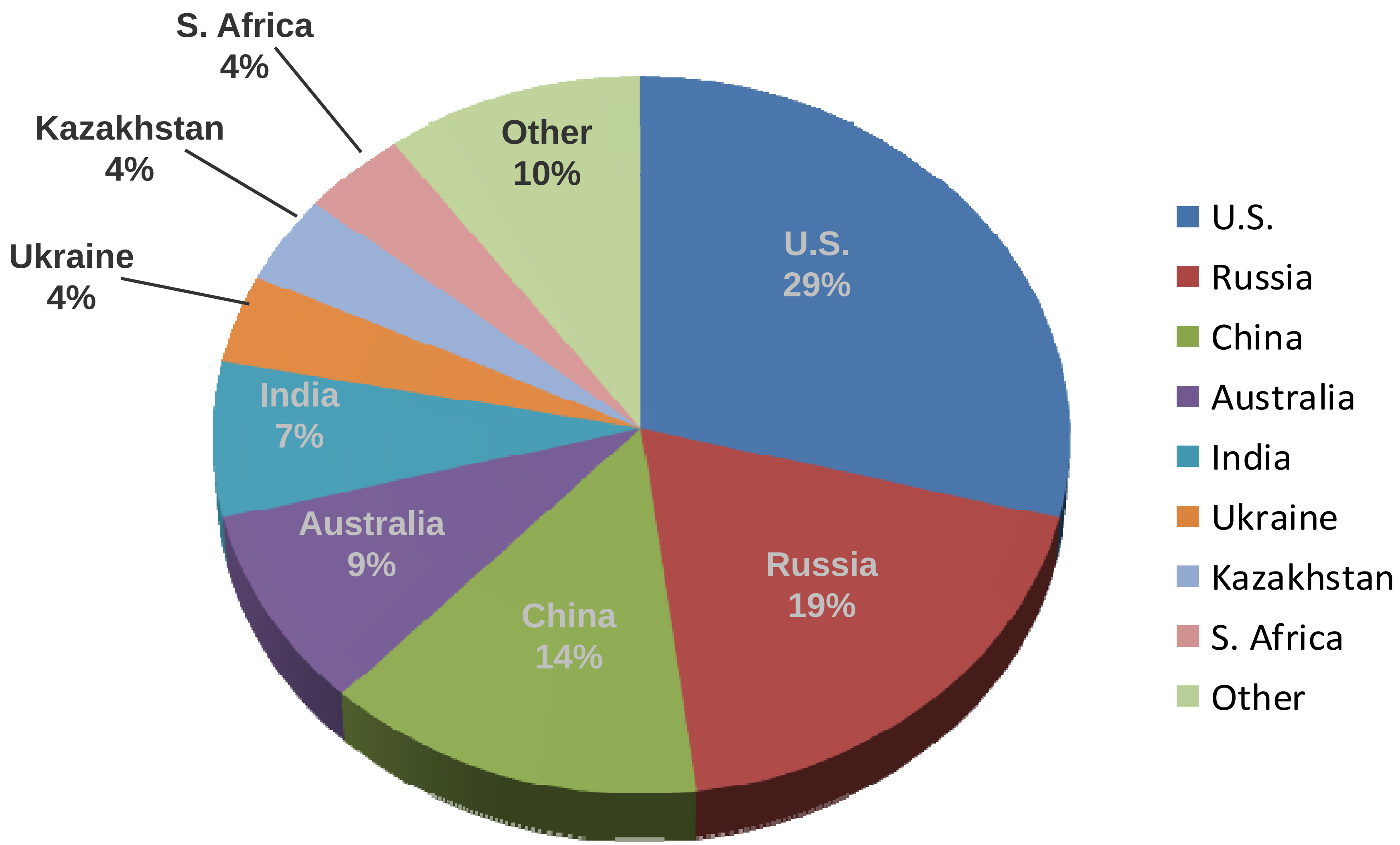
World Recoverable Coal Reserves



Source: Energy Information Administration

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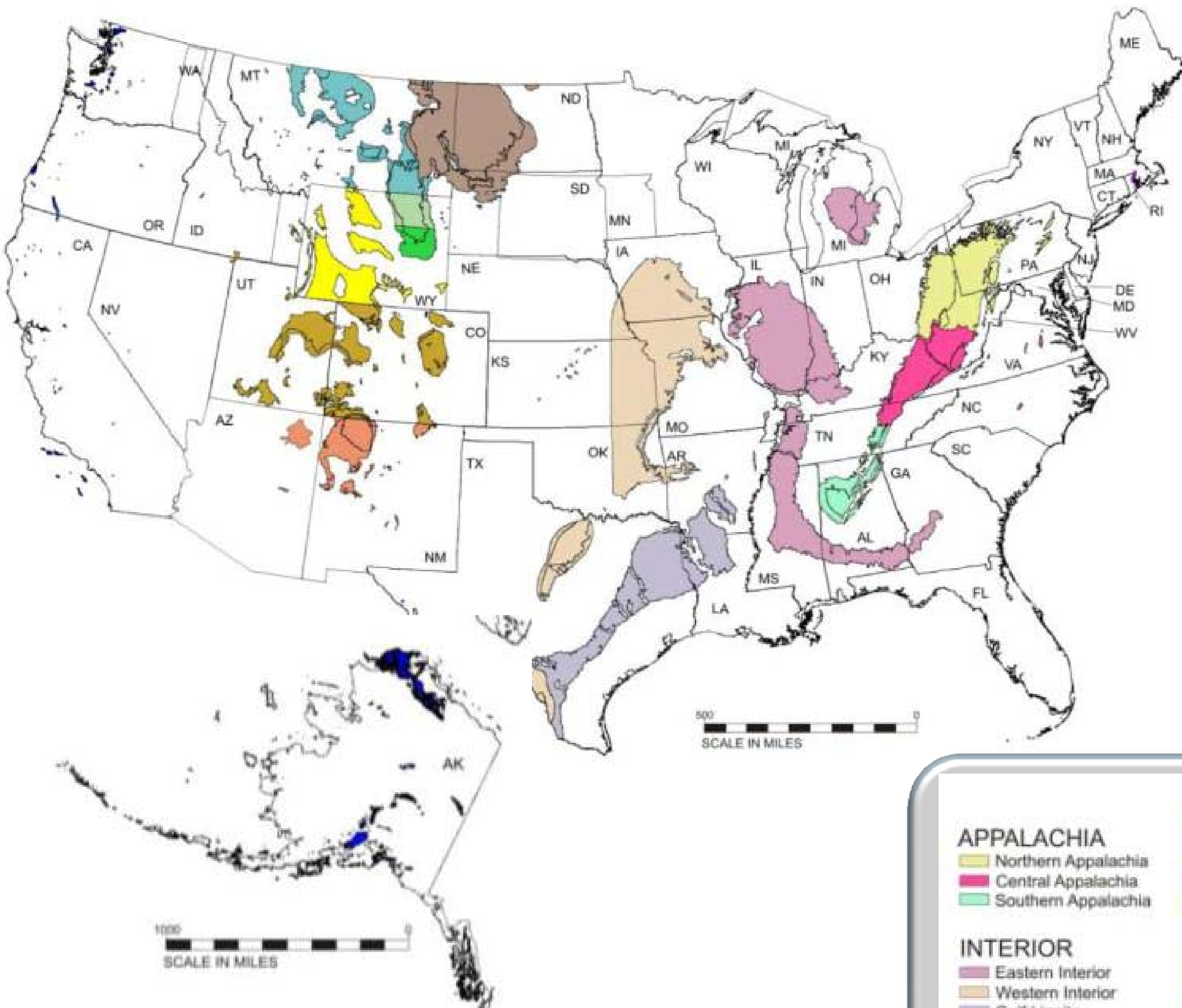
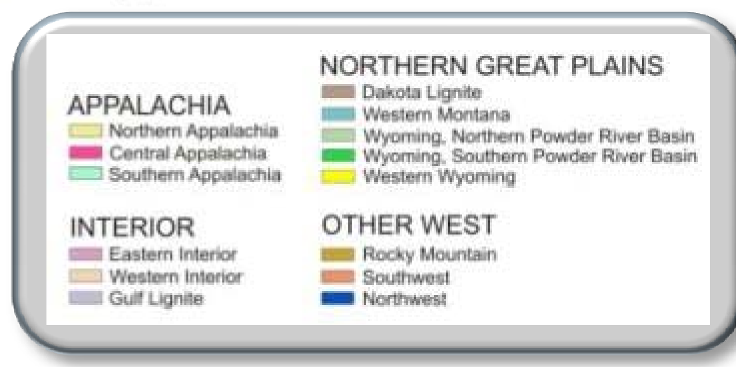
More than 200 Years of Proven Reserves

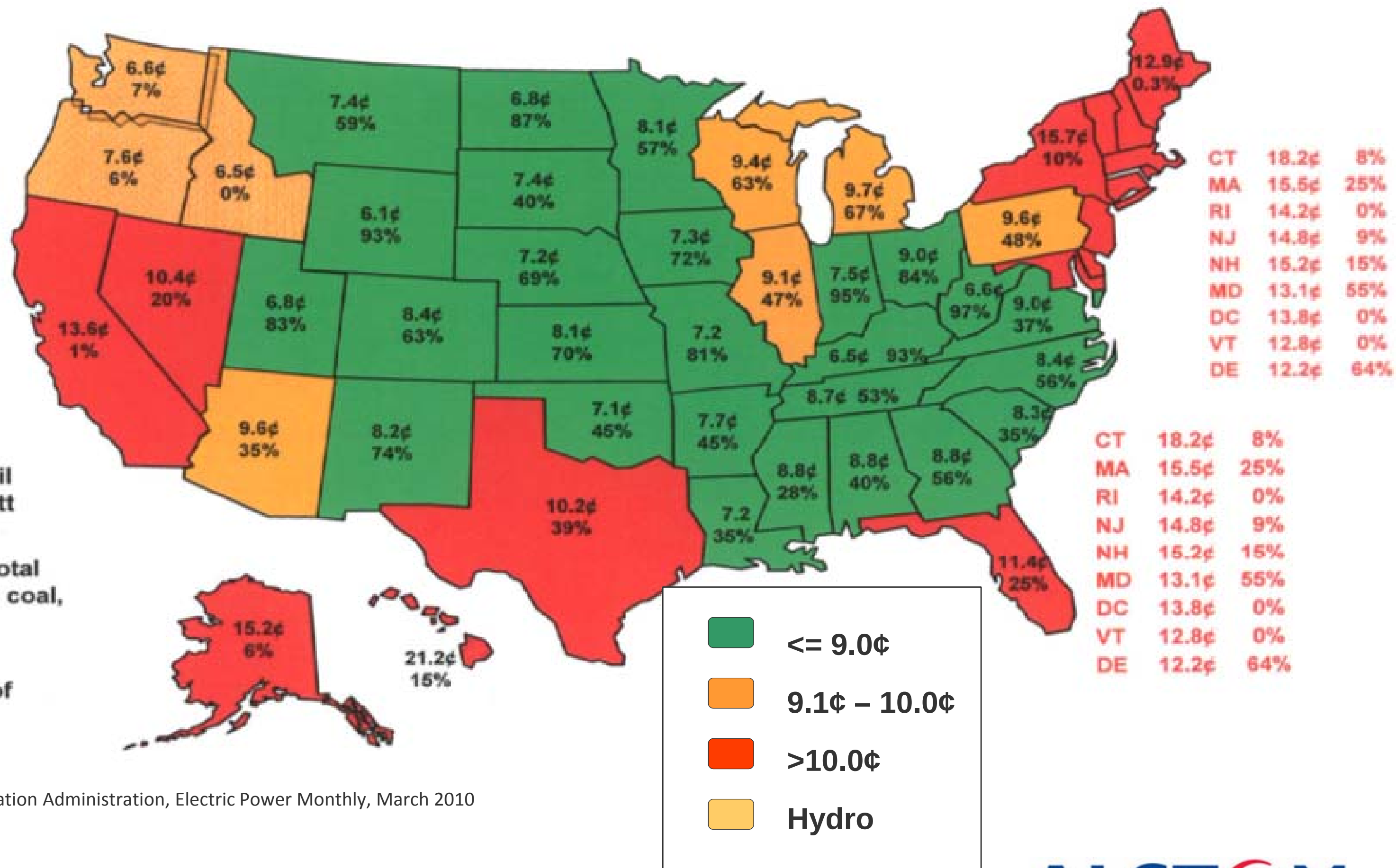


All–of –the–Above Strategy leads to a Matter of National Security



Coal Provides Low Cost Electricity

Cost per kWh and Percent of Coal Power Sector Generation



¢ = average retail price per kilowatt hour, 2009

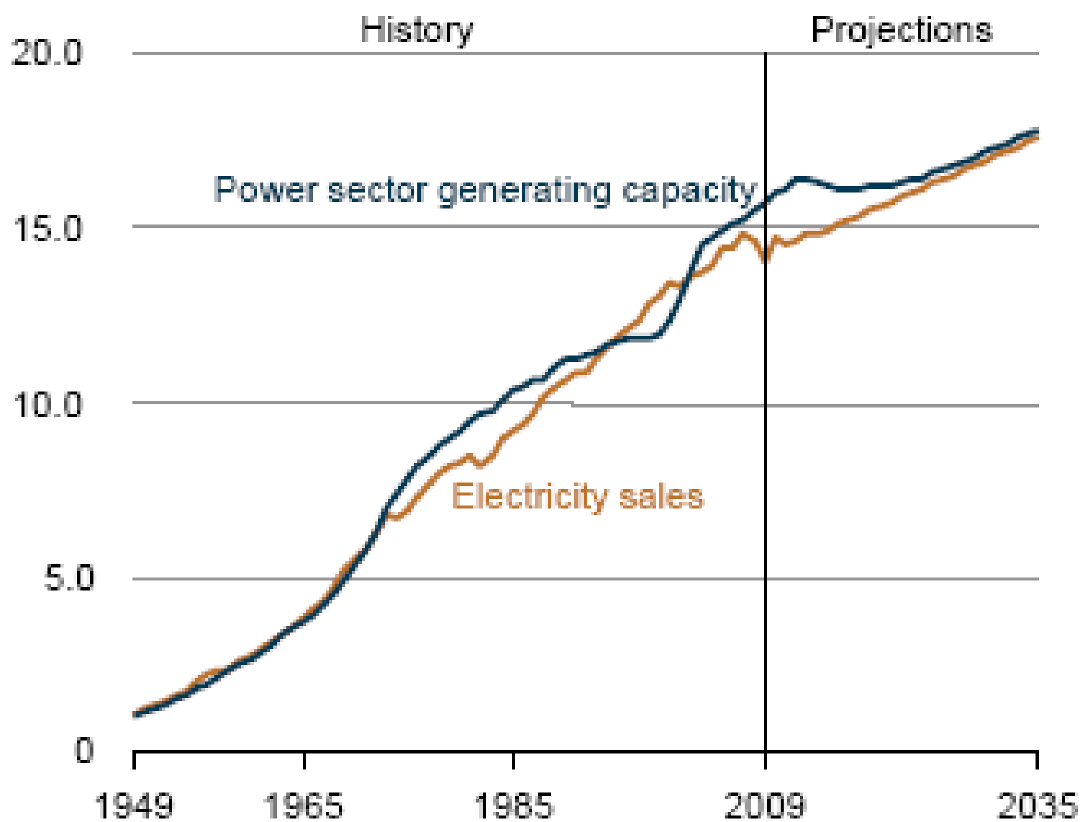
% = percent of total generation from coal, 2009

U.S. Average – 9.9¢/kWh 46% of generation

Source of Data: Energy Information Administration, Electric Power Monthly, March 2010

DOE/EIA projected growth of U.S. electric sales and generation capacity （1949=1.0）

Figure 80. Electricity sales and power sector generating capacity, 1949-2035 (index, 1949 = 1.0)



Source: DOE/EIA Annual Energy Outlook 2011.

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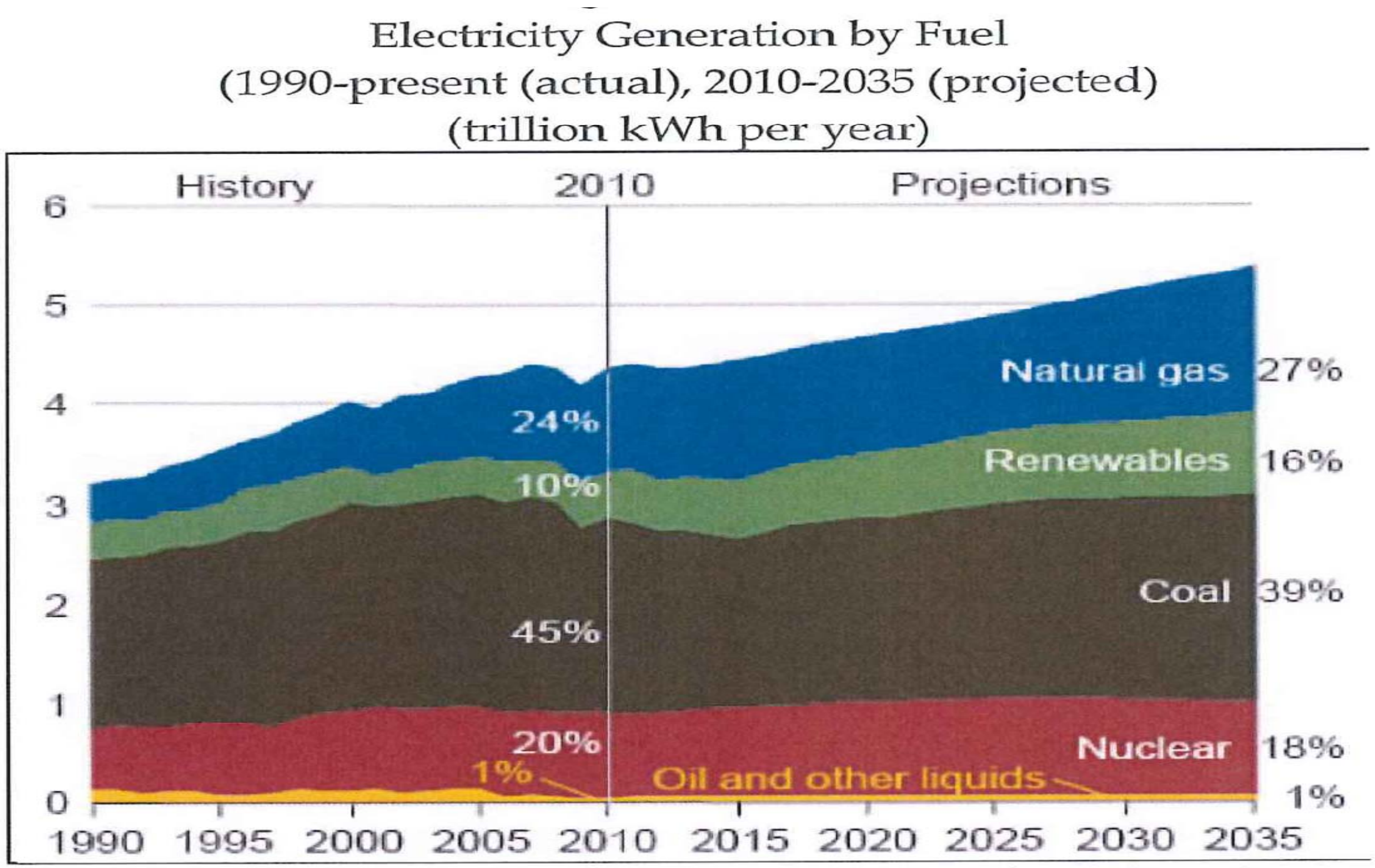
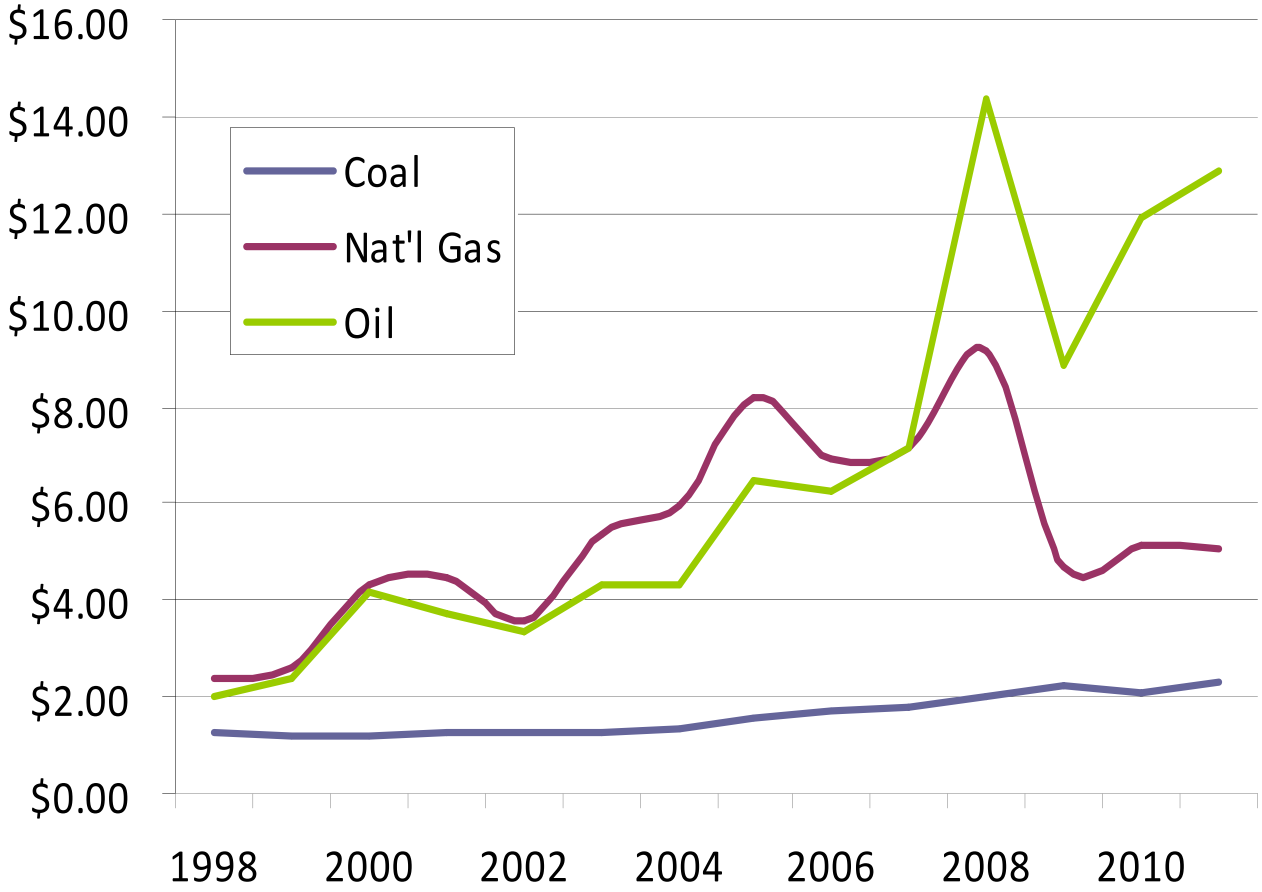
US Generation by Fuel



Source: EIA, Annual Energy Outlook 2012, Early Release Overview.

Coal Provides Price Stability

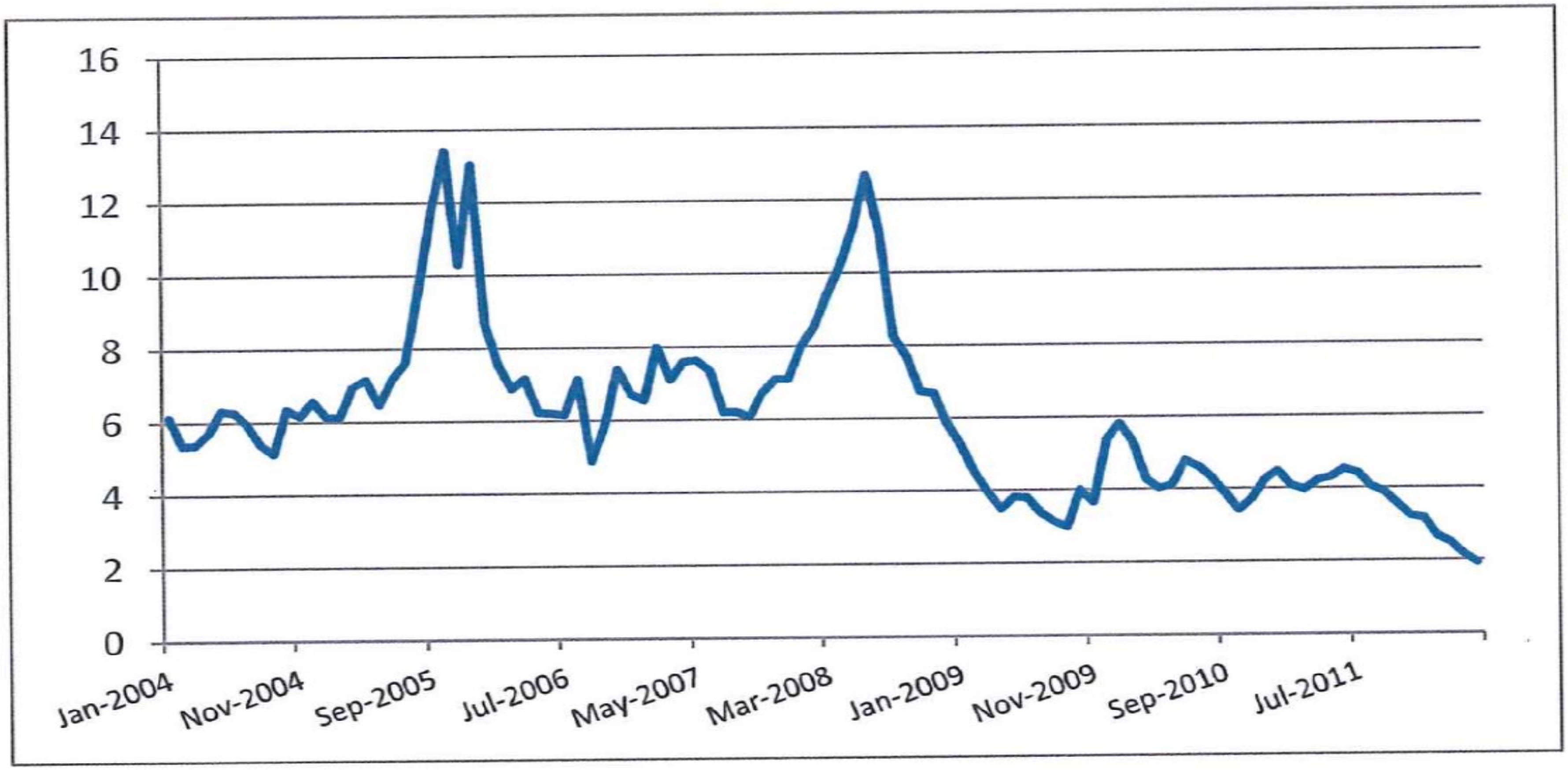
($/MMBTU delivered to utility power plants)



Source: DOE/EIA (2011 data are projections).

Volatility of Natural Gas in the Last Decade

Natural Gas Prices – 2004 through April 2012
(Henry Hub Spot Prices - $/MMBtu (nominal$))



Source: Energy Information Administration

The Value of Coal to The US Economy

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Coal Mining and Transportation Employment

	Mine workers	Support Activities	Transportation	Indirect and Induced	Total Jobs
Total Operations	93,000	64,000	61,000	372,000	590,000

Mine Workers are in 28 states
Coal-based generation in 47 states
Transportation is in 49 states

Coal Is Critical to Transportation

Coal accounts for 1 in 5 railroad jobs and 1 in 4 revenue dollars

Without coal, the railroad network as we know it would cease to exist – costs for all other freight would increase dramatically

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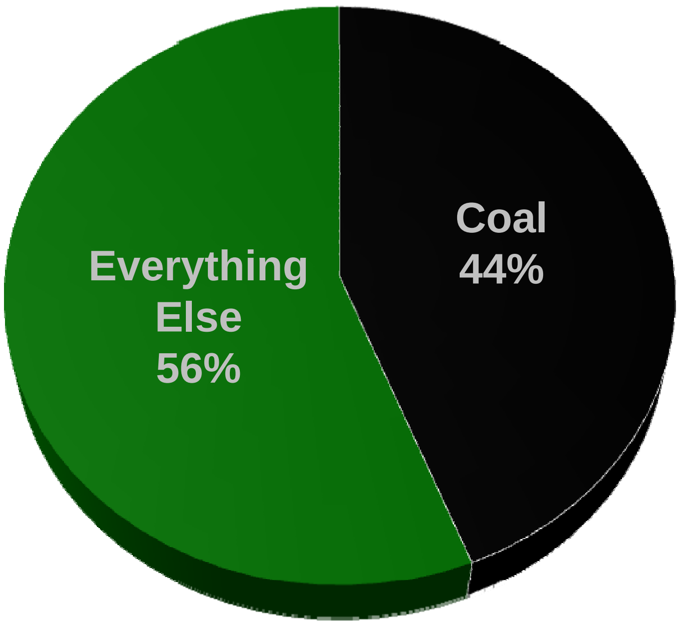
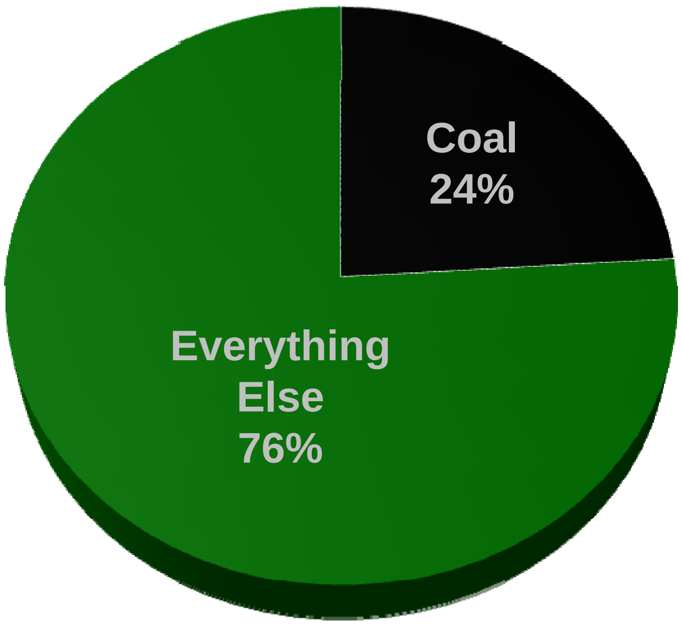
Coal as a Percent of U.S. Rail Traffic



Tonnage



Gross Revenue

Class I Railroads, 2010

Source of Data: Association of American Railroads, AAR Freight Commodity Statistics

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Impact of Low Gas Prices

- Drop in Coal Generation – as much as 50% in less than one year
- Retirements– many planned any way
- Questioning the investment in retrofit of APC equipment
- Coal to Gas conversions

Uncertainty

- Is Unconventional Gas the Future
  - Reserves announced and then down graded
  - Water and permit impacts
  - Chemicals Controversy
  - Seismicity
- Is Climate/Carbon Reduction a done Deal?
  - CCS not until 2020+?
  - Sequestration possible?

So What Needs To Be Done?

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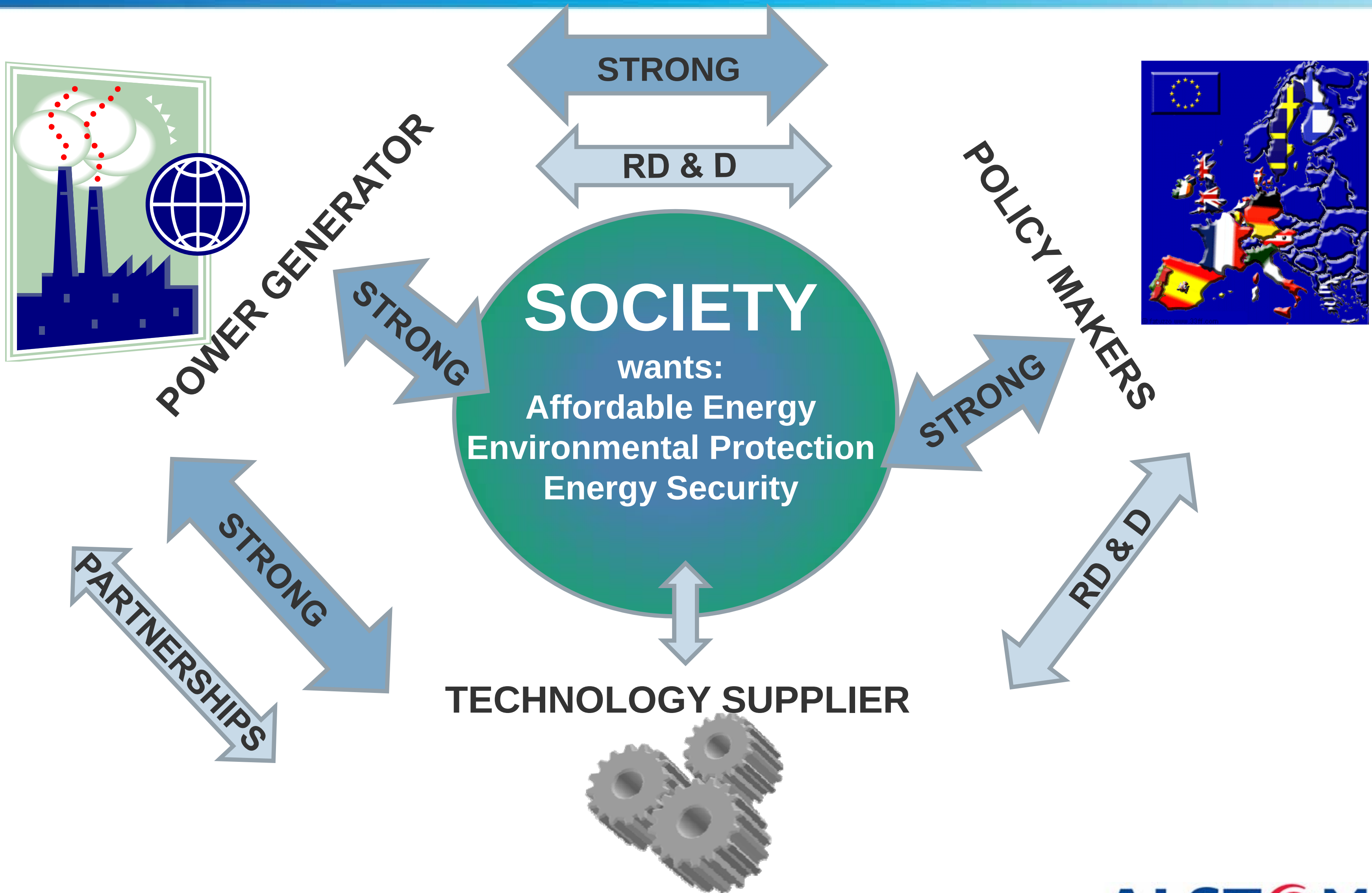
Suggestions

- The Industry needs to speak with one uniform voice
- Anti-coal efforts are well coordinated and financed
- We need to speed up technology development to market
- On a level playing field , coal is competitive
- Message about coal needs to be that it is clean and economical

Multiple Key Energy Policy / Technology Interfaces…



Challenges

- Develop equal consideration for all generation technologies
- Innovative, cost effective solutions for MATS and CASPR
- Accelerate the demonstration and cost reduction of CCS
- Demonstrate IGCC and continue to accelerate the development roadmap
- Deploy energy efficient technology to raise the fleet efficiency
- Work on Congress and permitting agencies to smooth the path for technology deployment and , where necessary , demonstration

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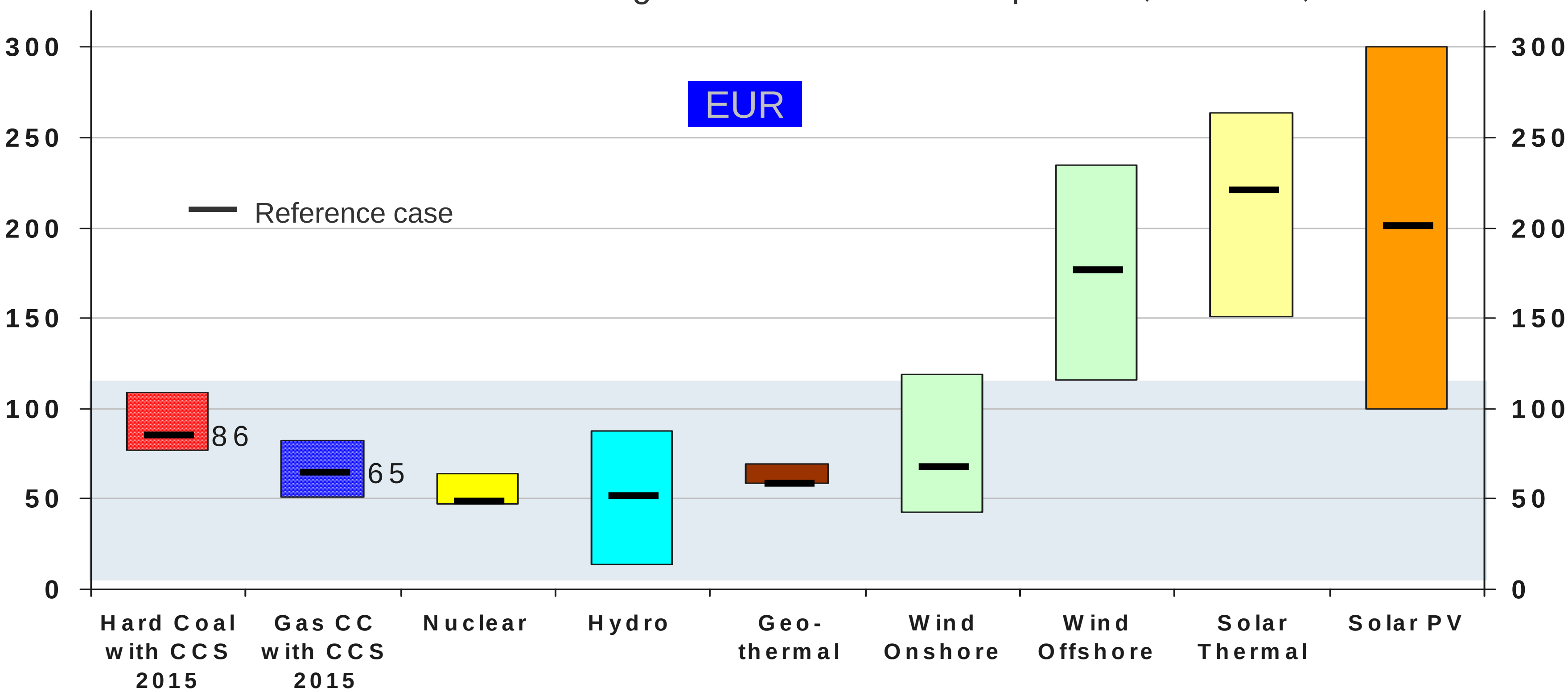
CCS is competitive against other low-carbon technologies, in Europe by 2015

€ / MWh CoE Low Carbon technologies over 2011-2016 period (New PP)



Source : Alstom analysis 2011. CCS Post amine 2015 costs, including on shore T&S and CO_2 price (Flue Gas Recirculation case for CCS Gas CC) – Cost for firming intermittent Power Generation not accounted

Under realistic assumptions and with a conservative variation range, CCS is competitive on coal and gas by 2015

Challenges and Needs

Political / Policy	Political will to establish global CO_2 targets Regional and National Energy Policies for CCS Robust regulatory frameworks
Legal	CCS Legislation (Capture, Transport and Storage) Permitting/consent regimes Capture ready requirements
Environmental Health & Safety	Emissions and waste standards for CCS (Capture technology) CO_2 specifications for Transport and Storage Storage site validation
Economic	Current power spreads do not support CCS CCS financial incentives Market mechanisms (Cap & trade, EPS, Carbon taxes, etc)
Commercial	CCS demonstration at commercial scale (bankability) Long term Storage liability Public acceptance ’

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Conclusions

- Existing coal plants will be retrofitted as they can not be shut down given lack of new plants being permitted.
- Retrofit of existing plants attractive given projected cost of new PC or IGCC base load plants- Impact of new Gas Capital costs?
- New plant costs will not be significantly increased to comply with MATS and CSAPR regulations
- Permitting of new plants will be mired in uncertainty until proper guidance on CCS in the interim period
- Permitting will remain difficult until the industry handles the perception of coal as dirty and expensive, and gas as cheap and plentiful
- Coal needs a level playing field with all generation technologies

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Does Coal Have A Future?

It Is Up To All of US!!

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