

# Under the lamp post (nothing but moths?)



Kevin Leahy - Managing Director, Environmental & Energy  
Policy

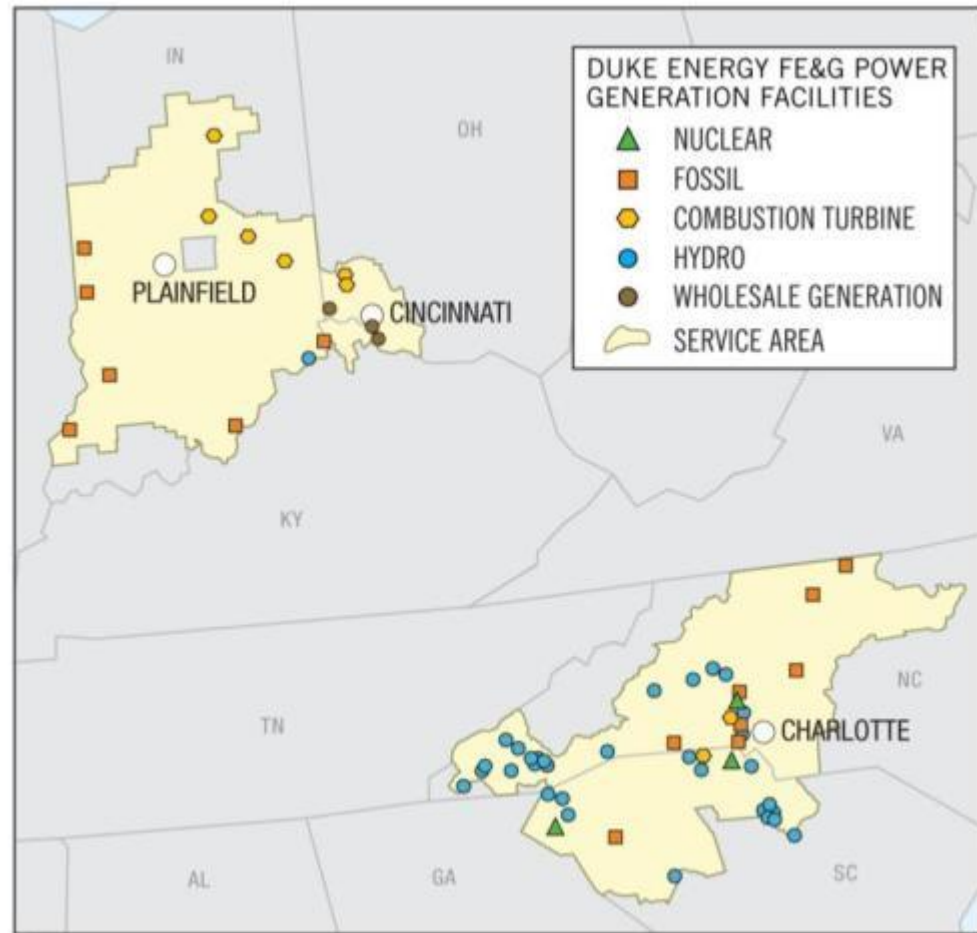
**HEPG**

*Tucson, AZ*

*Dec 9, 2010*

# U.S. FRANCHISED ELECTRIC AND GAS

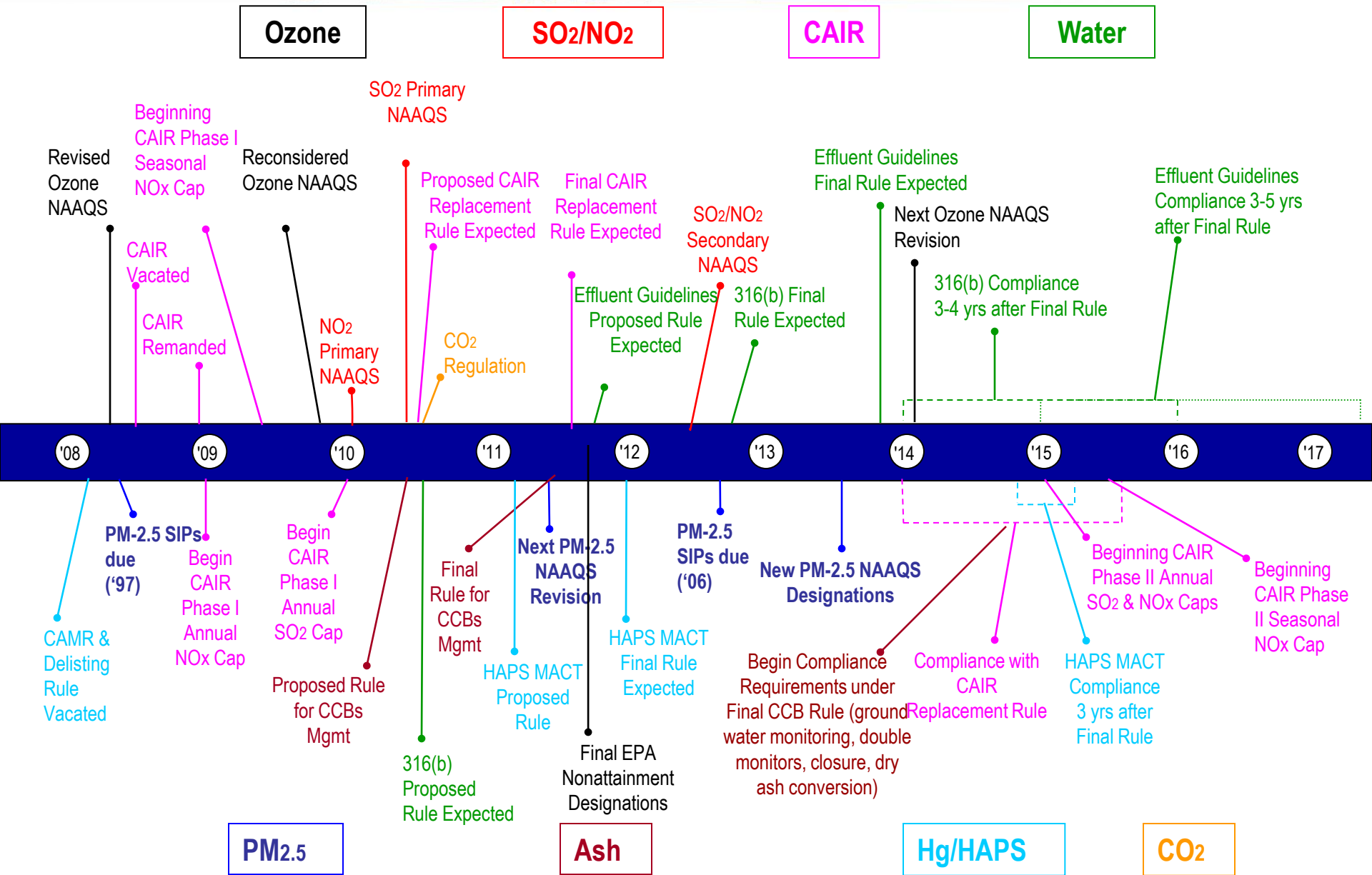
- 5 states: North Carolina, South Carolina, Indiana, Ohio and Kentucky
- 50,000 square miles of service area
- 27,000 MW of regulated generating capacity
- 4.0 million retail electric customers
- 500,000 retail gas customers in the Cincinnati area



## U.S. Generation fleet aging

- About 500,000 MW of electric generation plants in the U.S. -- about 300,000 MW fueled with coal
- Most large plants built between 1960 and 1980
- Many of these already have pollution controls
- Few pre-1960 vintage plants have pollution equipment
- Most of these responsible for largest share of criteria pollutants (SO<sub>x</sub>, NO<sub>x</sub>, mercury and so on)
- 30 to 60,000 MW likely to retire between now and 2016
- Must replace this capacity – what tech to deploy?
- Climate the wild card --

# Pending Regulations



# **WAS COST CLIMATE'S FATAL FLAW?**

# What's the acceptable price for any policy?

- In terms of rate impact? Some climate bills had moderate near term impacts with strong limits on volatility
- Indiana electricity impact of K(G)L (one of the most coal intensive states): Between 5 and 10% electricity price increase –
  - \$6 to \$12/month/household or 20 to 40 cents/day
- Gasoline price – 1 penny/gallon for each \$/ton CO<sub>2</sub>, therefore, if assume \$20/ton, 20 cent/gallon.
  - 20 mpg vehicle driven 40 miles/day = 40 cents/day
- Therefore (conservative) impact on pocket is from 60 to 80 cents/day in IN
- Real economic costs (NPV of annual reduction from “no policy case”) as per EPA analysis of \$79 to \$146/year/household or 22 to 40 cents/day
  - 2.6 people/household → cost of 8.5 to 15 cents/day/person

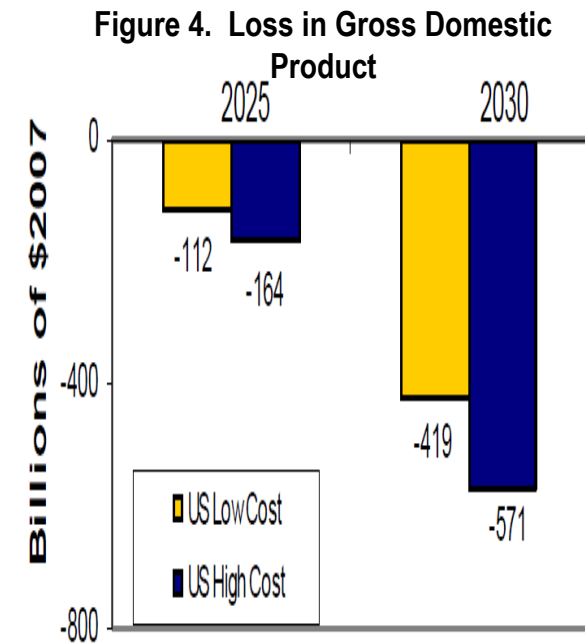
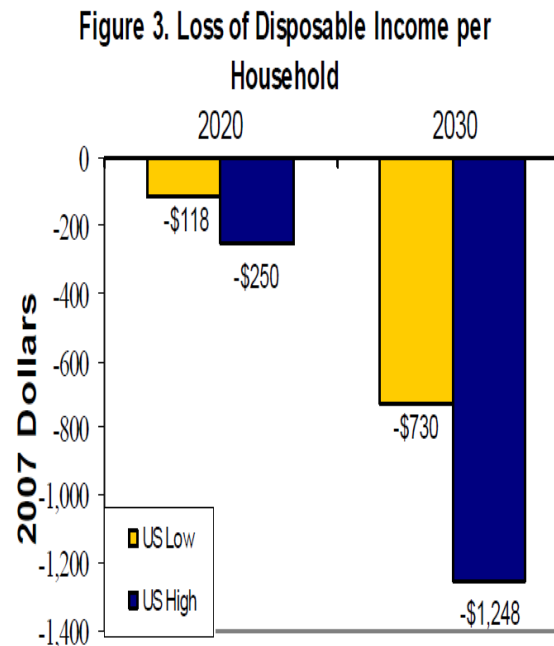
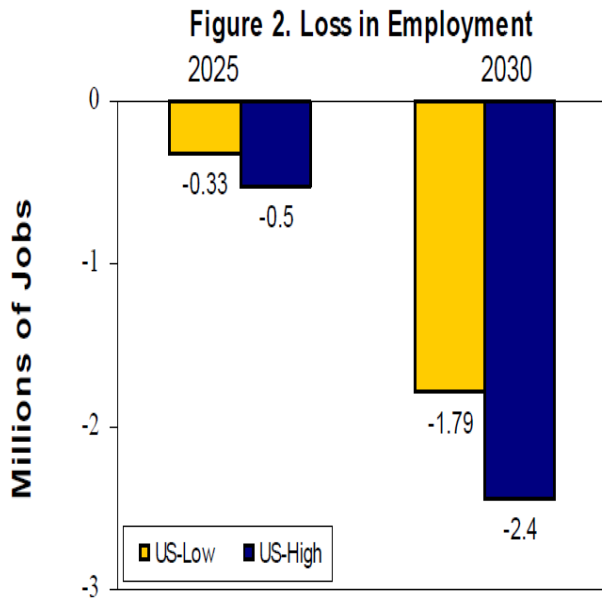


# Economics in the Political Debate

## NAM's Analysis of Climate Legislation (House passed version – Senate version was less costly)

NAM examined scenario of slow technology deployment with severely limited offsets—legitimate “worst case” view

- “U.S. jobs decline by 1.8 million under the low cost case and by 2.4 million under the high cost case”
- “would impose a financial cost on households of \$118 to \$250 by 2020 and \$730 to \$1,248 by 2030”
- “reduce U.S. Gross Domestic Product (GDP) by between \$419 billion and \$571 billion by 2030 GDP falls by 1.8% under the low cost case and by 2.4% under the high cost case in 2030.”



# Not Bad Enough?

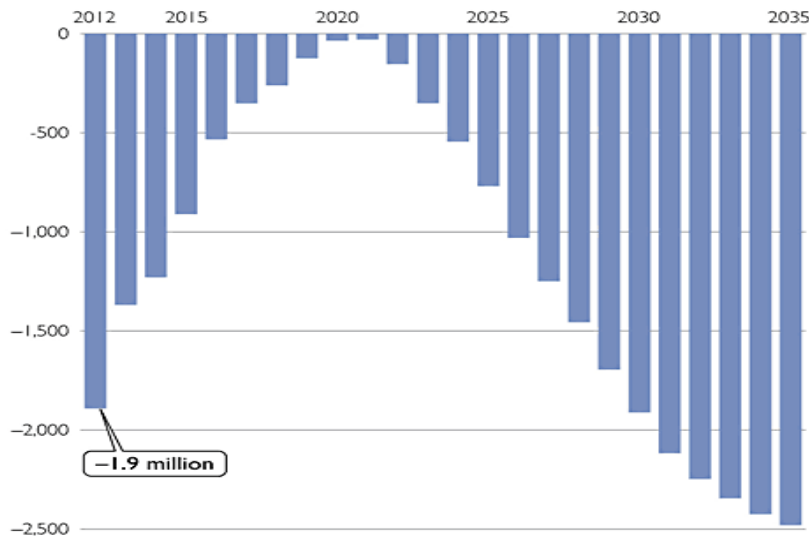
## Heritage Foundation's Analysis of House passed climate legislation -- Waxman Markey Examining scenario of "wheels coming off"

- Ignored cost containment provisions – no offsets, no allocations, no technology, CO2 price constraints ignored
- Very high CO2 prices in first year, resulting in energy price shocks

### Waxman–Markey Climate Change Bill Would Cost Millions of Jobs

The legislation would increase unemployment levels for every year: 1.9 million fewer jobs in 2012, and an average of 1.14 million fewer jobs from 2012 through 2035.

Change in Employment Due to Waxman–Markey Climate Change Bill, in Thousands of Jobs



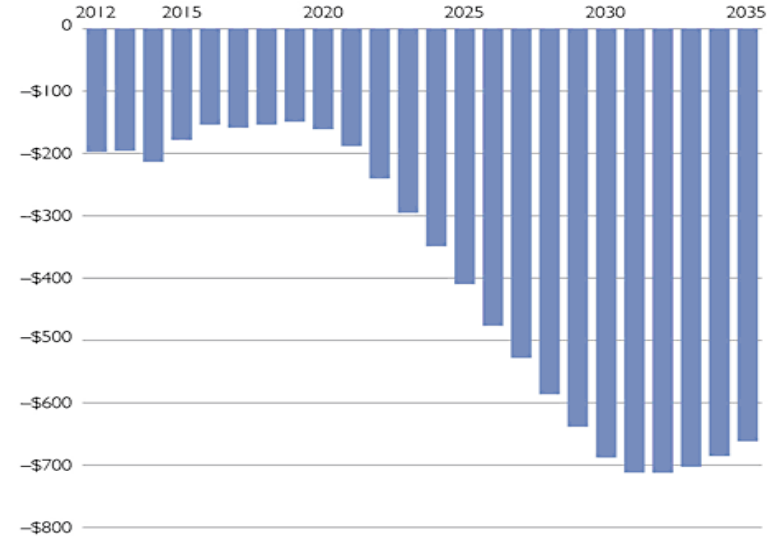
Source: Heritage Foundation calculations based on the IHS/Global Insight U.S. Macroeconomic model.

Chart 1 • CDA 09-04 heritage.org

### Waxman–Markey Climate Change Bill Would Weaken the Economy

The legislation would reduce the economy by no less than \$120 billion in any year, with an average loss of \$314 billion from 2012 to 2035 and cumulative losses exceeding \$9.4 trillion.

Annual Change in Gross Domestic Product Due to Waxman–Markey Climate Change Bill, in Billions of 2009 Dollars



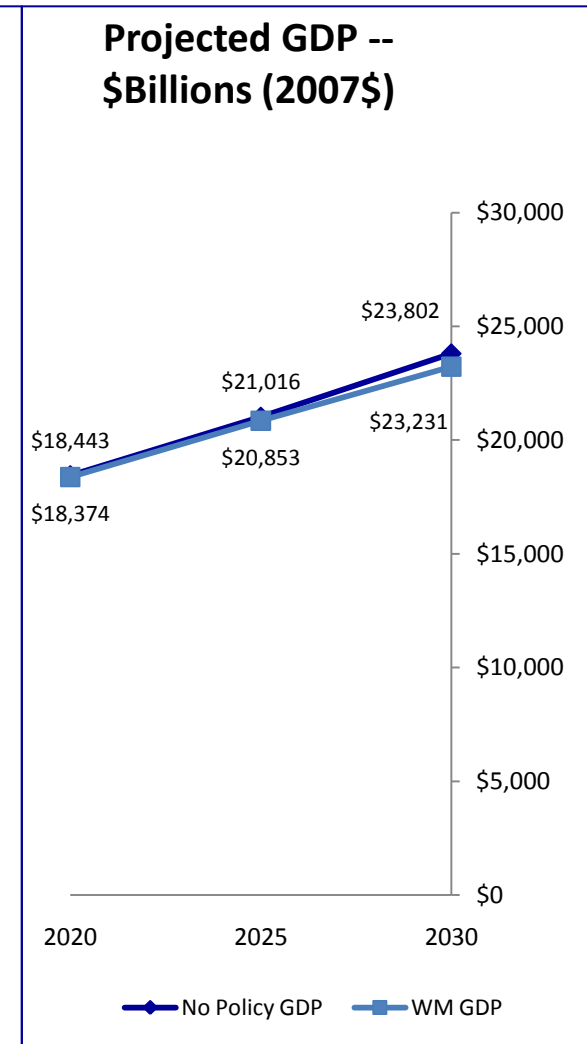
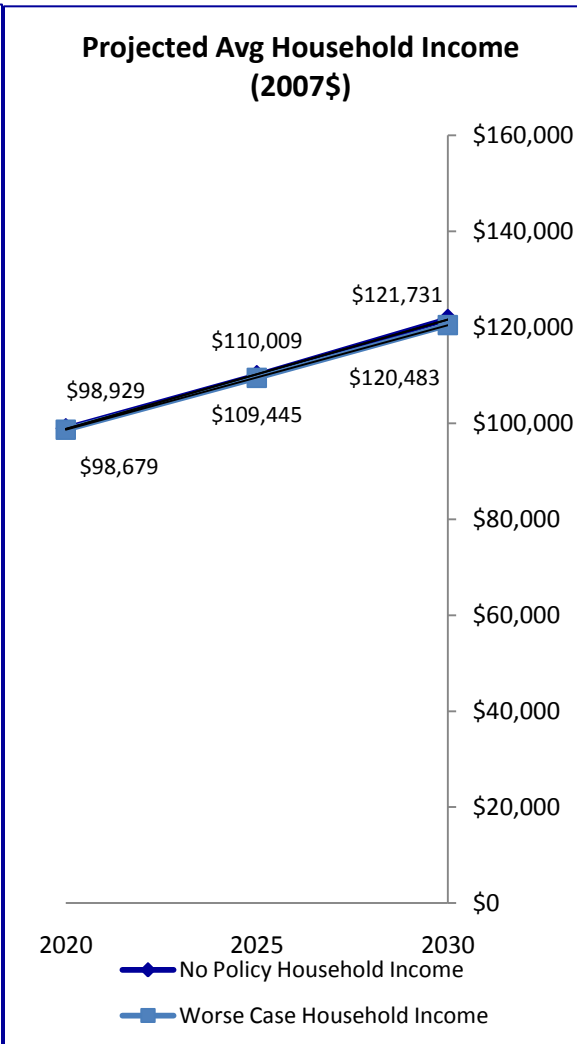
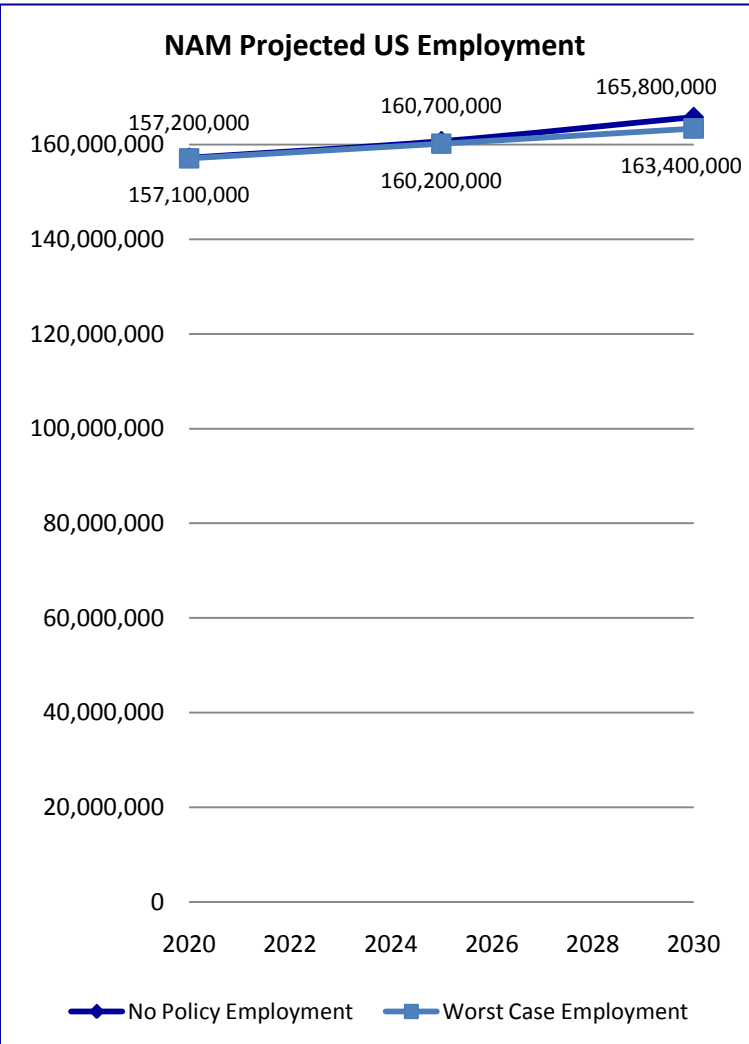
Source: Heritage Foundation calculations based on the IHS/Global Insight U.S. Macroeconomic model.

Chart 4 • CDA 09-04 heritage.org



# NAM With Context:

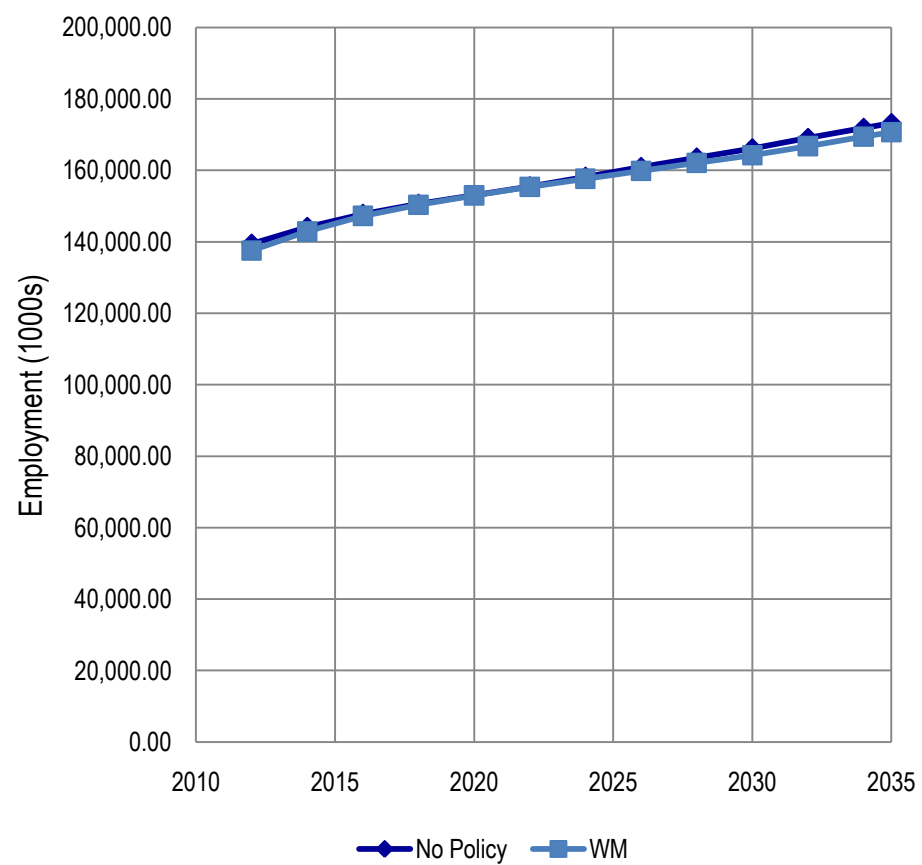
Same analysis & model output  
 Not a matter of “loss” but delay in achieving the same “no policy” numbers – a matter of months.



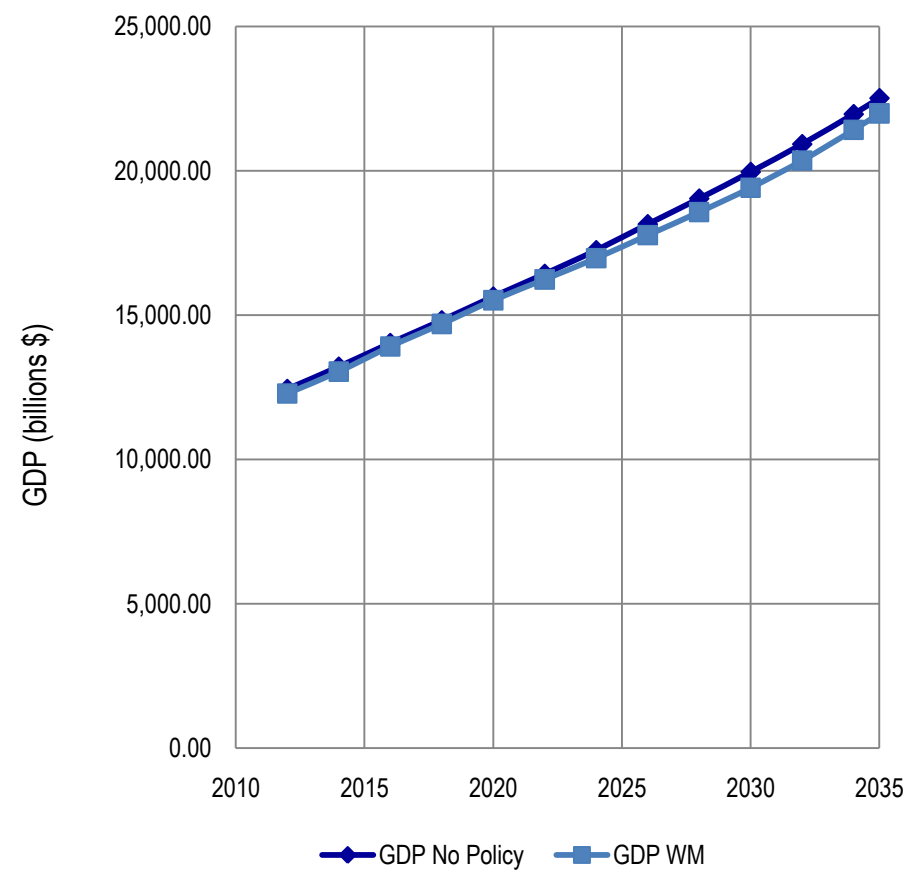
# Is Heritage just another organization overwhelmed by optimism?

Same model runs and output as slide 7

## Waxman Markey Employment Impacts



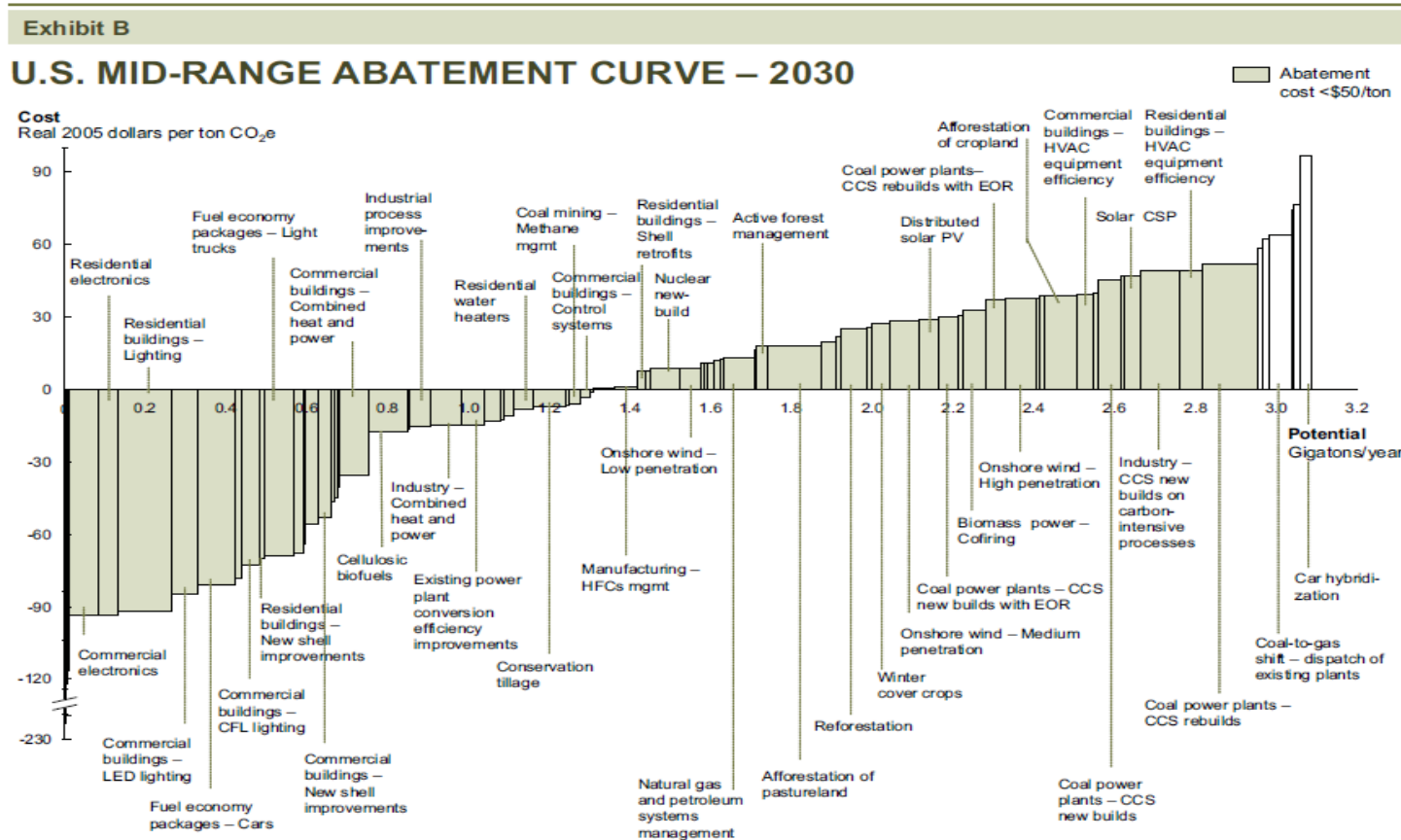
## WM Impact on GDP



Source for above data: Heritage Foundation analysis of Waxman Markey -- [http://www.heritage.org/research/energyandenvironment/images/CDA-waxman-markey-appendix-table-2\\_1.gif](http://www.heritage.org/research/energyandenvironment/images/CDA-waxman-markey-appendix-table-2_1.gif)

# **ENERGY EFFICIENCY FREEBIE?**

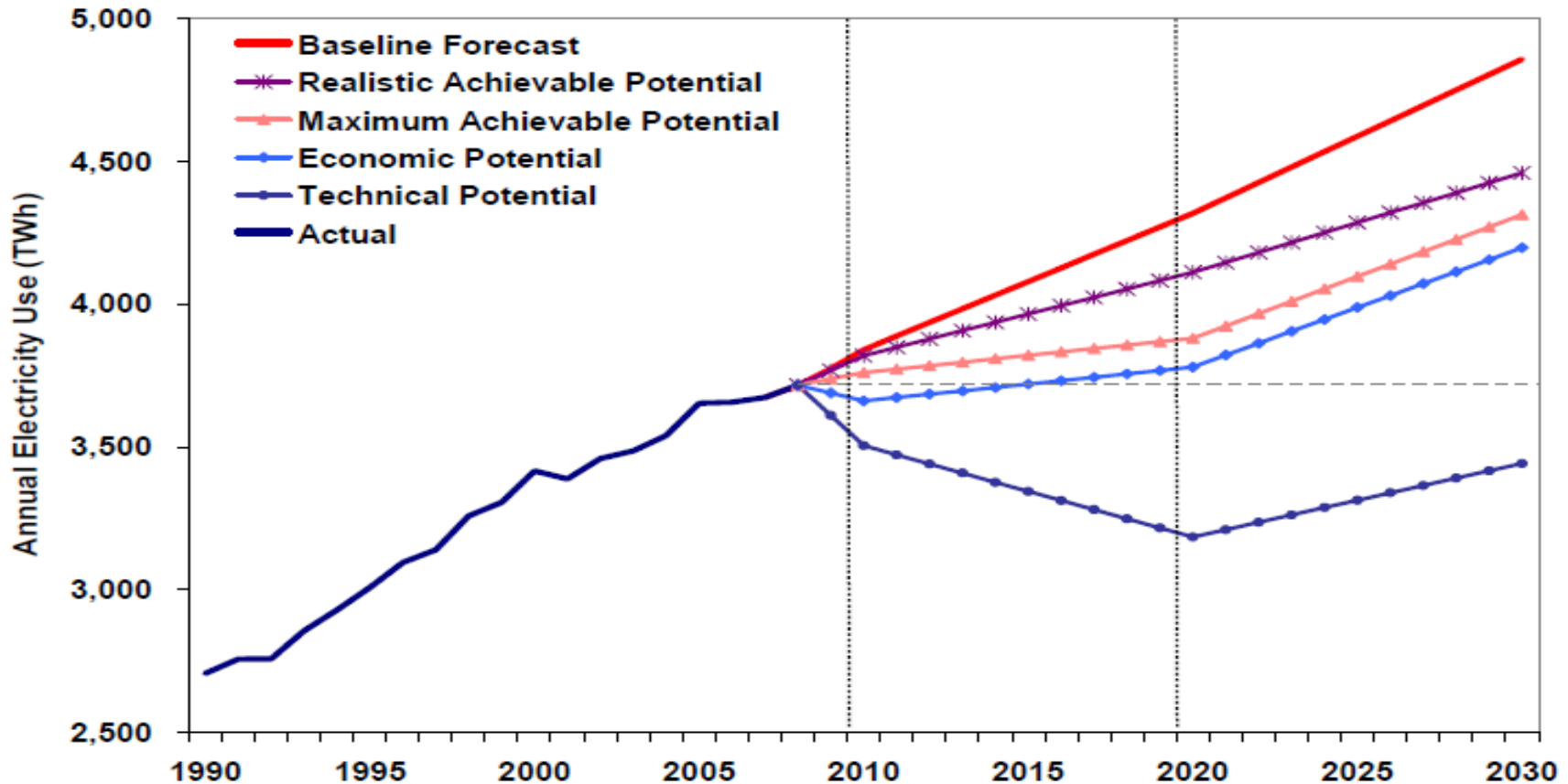
# Really? → Up to our knees in “negative costs”



Source: McKinsey analysis

From: Reducing U.S. Greenhouse Gas Emissions: How much at what cost?  
 U.S. Greenhouse Gas Abatement Mapping Initiative, Executive Report, Dec. 2007

# EPRI less confident



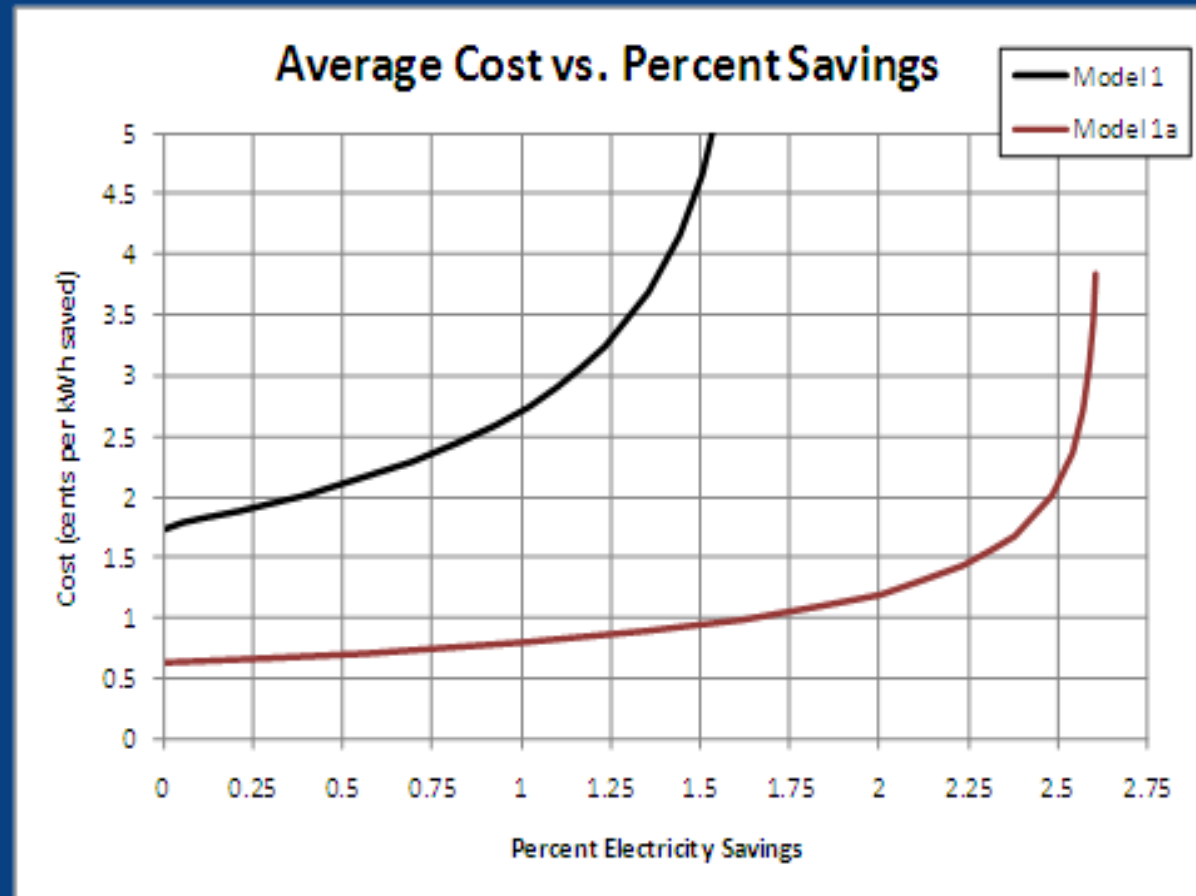
**Figure 4-3**  
**Energy Efficiency Potentials in Context of Baseline Forecast**

Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the U.S.

(2010–2030)

1016987 Technical Report, January 2009

# Percent Energy Savings and Average Cost (models 1 and 1a, preliminary)



Cost-Effectiveness of Electricity Energy Efficiency Programs

Karen Palmer  
RFF Senior Fellow  
(co-authors Toshi Arimura,  
Richard Newell and  
Shanjun Li)

RFF Cancun Side Event on  
Energy Efficiency

December 6, 2010



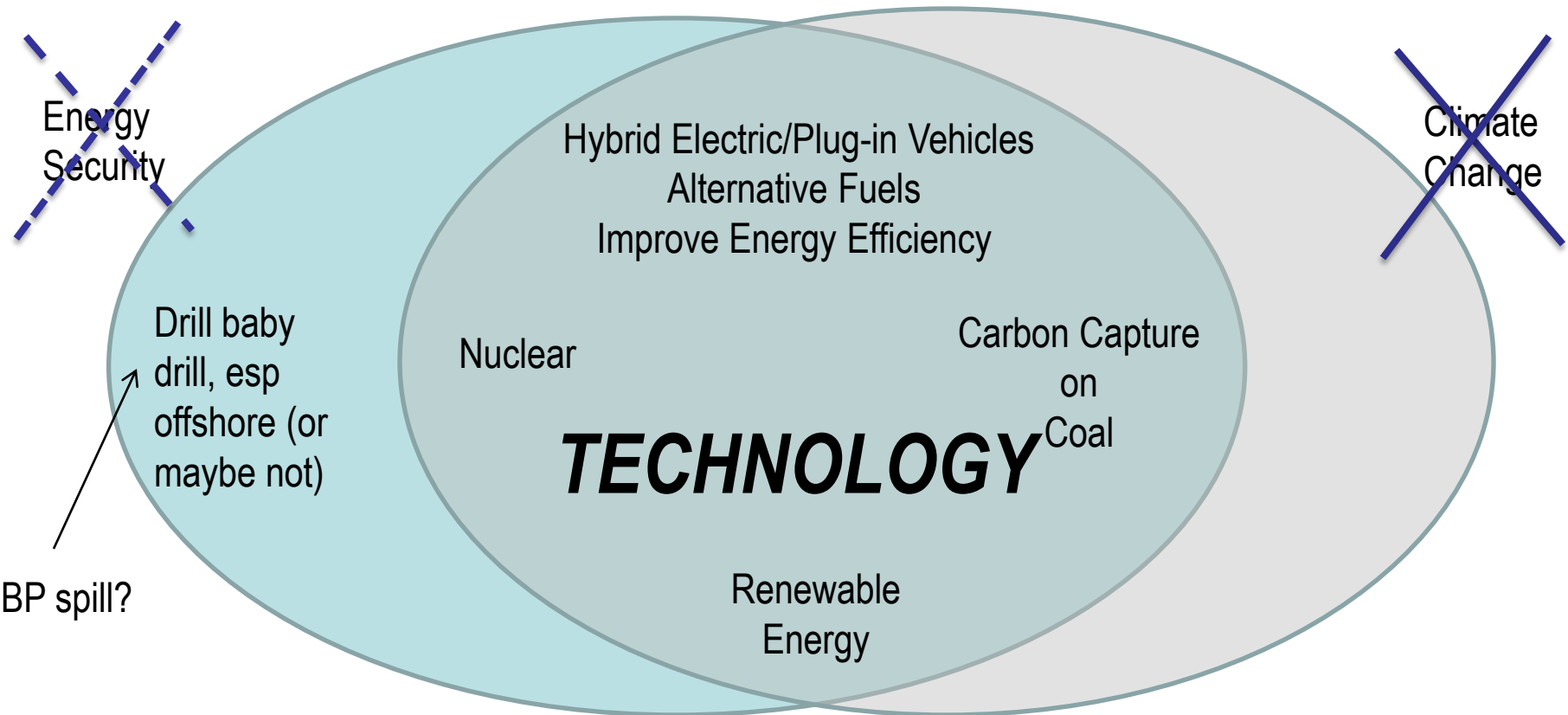
# **TECHNOLOGY R&D?**

# The \$25B/yr R&D idea\*

- Is \$25B/yr > 0 in today's political environment?
- Innovation in energy is typically around integration -- there are few truly "new" techs – electro/mechanical/chemical world – 100+ years of development
  - Coal gasification
  - Solar
  - Wind
  - Nuclear
  - Batteries
- Smart phone is very poor analogy for energy
  - Thermodynamics
- Need to build the BIG projects – Don't like rent seekers? Don't like big government funded projects? Don't like picking winners?

\*POST-PARTISAN POWER, HOW A LIMITED AND DIRECT APPROACH TO ENERGY INNOVATION CAN DELIVER CLEAN, CHEAP ENERGY, ECONOMIC PRODUCTIVITY AND NATIONAL PROSPERITY, Steven F. Hayward, American Enterprise Institute, Mark Muro, Brookings Institution, Ted Nordhaus and Michael Shellenberger, Breakthrough Institute

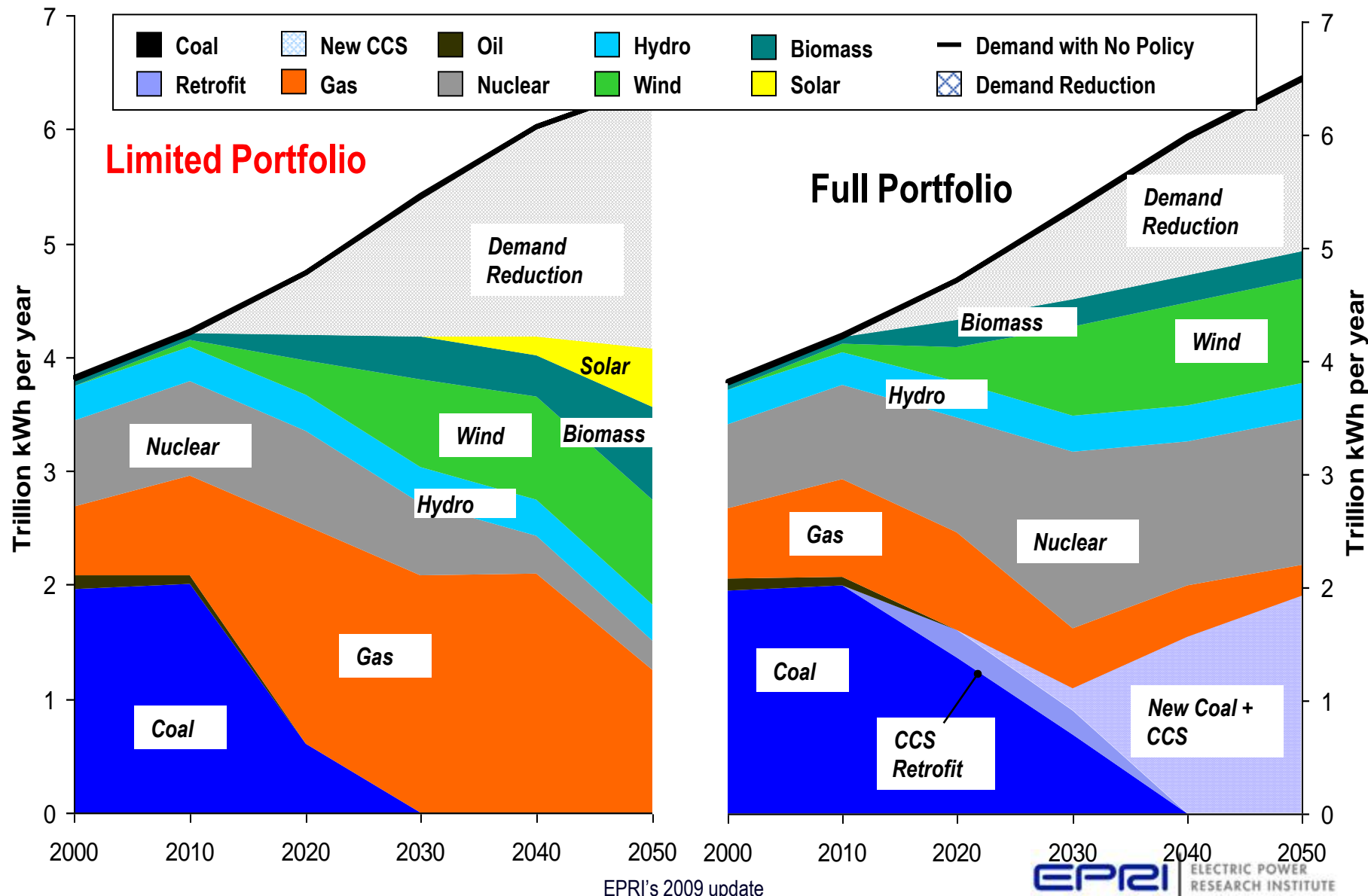
# 2011 -- Possible focus on technology...and JOBS



- Jobs don't matter unless they are here
- Batteries and turbine blades – big or heavy
- Energy security could still be component – domestic nat gas not for electricity, but for vehicles
- Small legislation, comprehensive (bloated) polices out
- Libertarians now taking aim at all “rent seekers” (renewables, nuke, EE and EV proponents)

# Electric Sector Tech

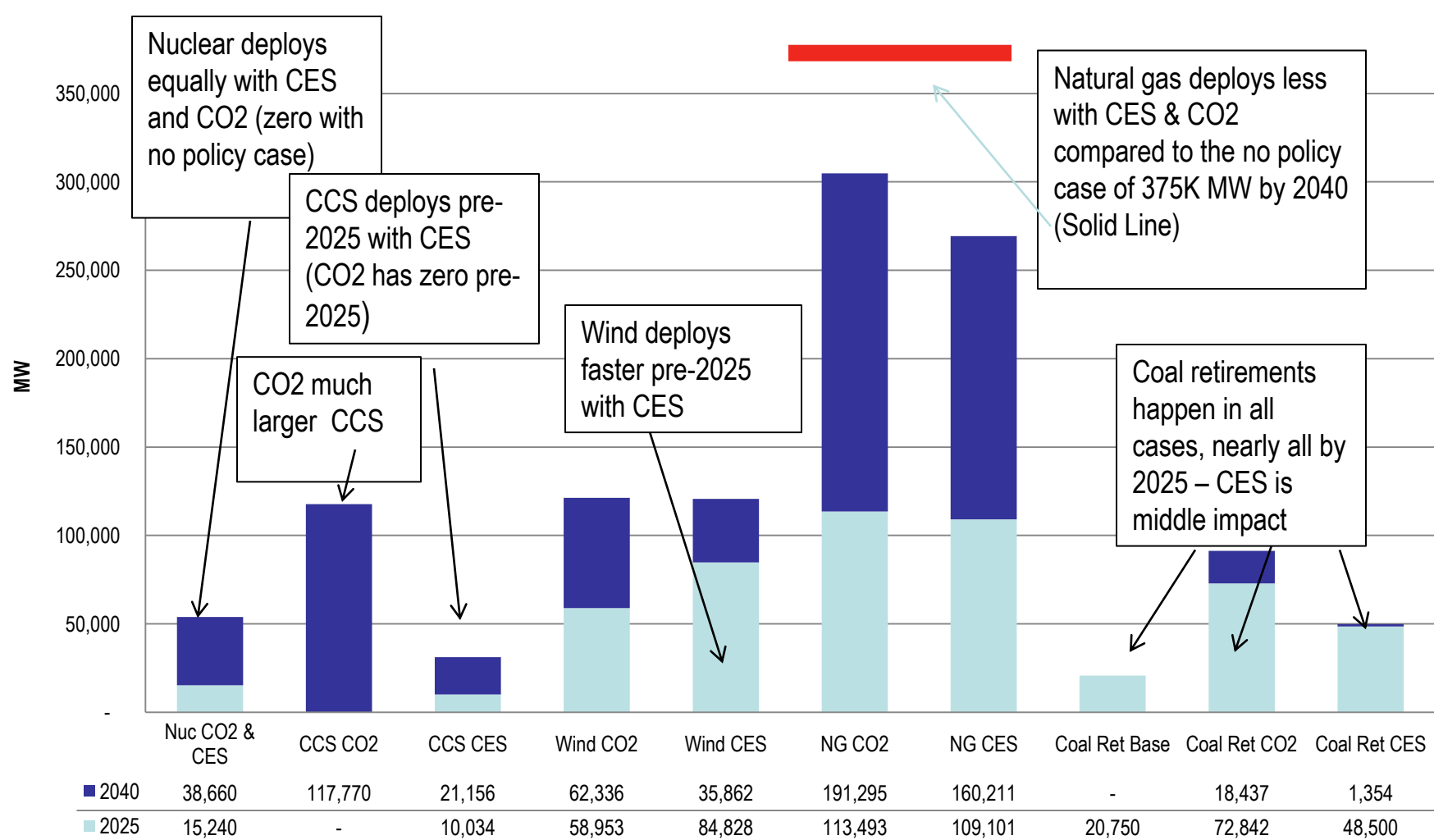
Two Scenarios with market based policies



# Lugar's CES Idea



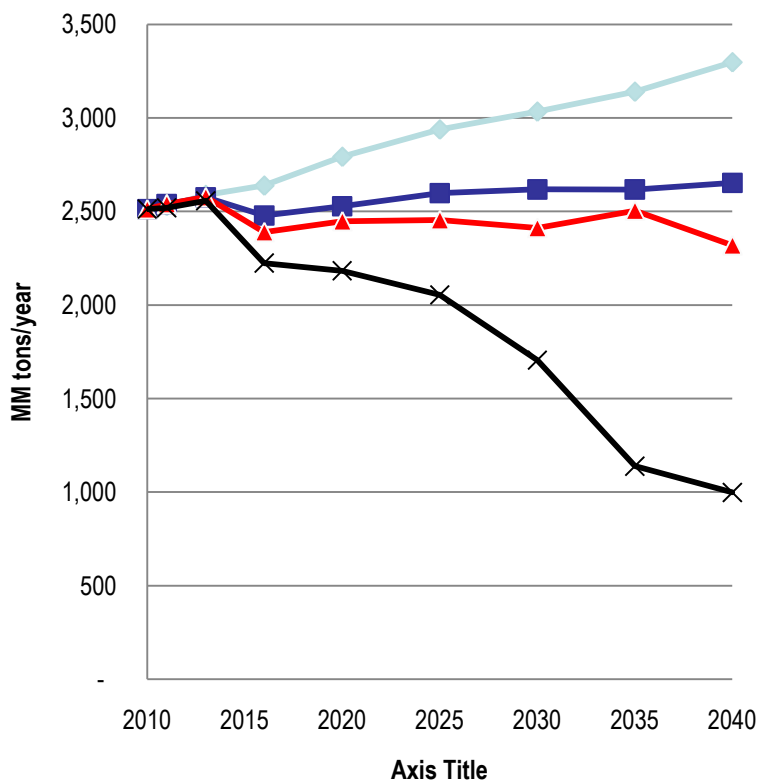
Total Capacity Build By Technology and Scenario (IPM model run, summer 2010 best guess regulatory scenario) Assumptions no longer valid. Lugar CES, CO2 price and no policy scenarios.



Model run did not include possible ash, water regulations, nor did it include REDD as a CES compliance option

# CES Complements, Not Replaces, Future CO2 Policy

## CO2 Emissions



—◆— Baseline —■— Lugar no EE —▲— Lugar w/EE —×— CO2 price

Graph from ICF model run

- Today's backlash against legislation provides a respite, not a pardon
  - Scientific bodies' views regarding long term risks are unchanged
  - Delay may cause future targets to be tighter than recent legislative proposals (80% economy wide emission reductions by 2050 = near complete decarb of electricity emissions)
- CES pushes technology, not emissions
  - Market based – efficient
  - No change in dispatch between coal and nat gas
  - Salvages power sector's technology strategy & prevents die-off of nascent tech supply chain (Schlumberger, Areva, Siemens, ADP, etc)
- CES makes future CO2 policies an “easier lift” because tech has running start
  - Reduces risks of large rate increases because system will already have some low-emitting tech deployed
  - Technology will be further advanced, therefore will cost less
- Policy still not free -- \$50 alt compliance payment = \$7/ton CO2 price with full auction with Lugar policy



- Economics don't really matter – long term projections of CO2 costs equivalent to rounding errors in investment decisions
- – chicken and egg problem – sour economy makes stakeholders reluctant to support big projects or legislation
- Is the only noble advocate the one who wants status quo or regulatory unraveling?
- Political support for policy measures “as long as it doesn't cost anything”
- EE is fine, but real questions re depth of supply
- Can not advance new technologies (or old for that matter) if requirement is zero cost – forced to ride down capital stock & face eventual capacity problems or ...
  - Make suboptimal near term investments in natural gas and lose opportunities to advance new technologies
    - Exposure to nat gas price risk increases (minor point?)
  - Lose time in technology development
  - Lose nascent engineering, design, project management and domestic manufacturing of key components (nuclear, CCS, etc.)

