

Reconciling Coal and Climate

David Hawkins
NRDC
March 2009



Why NRDC CCS interest?

- NRDC started looking at CCS 12 years ago. Why?
- Not because we prefer fossil fuels. We don't.
- Not because we are trying to minimize CO2 control program costs. While important, this is not our top priority.
- Not because we believe it is impossible to protect the climate without CCS. A strong case can be made that efficiency and renewables could provide a long-term solution.
- But we saw and still see a huge gap between what we need to do and what we are doing. Clean energy development is not happening fast enough.
- We believe CCS can stimulate faster policy action and help fill the gap between what we need to do and what we have committed to do.

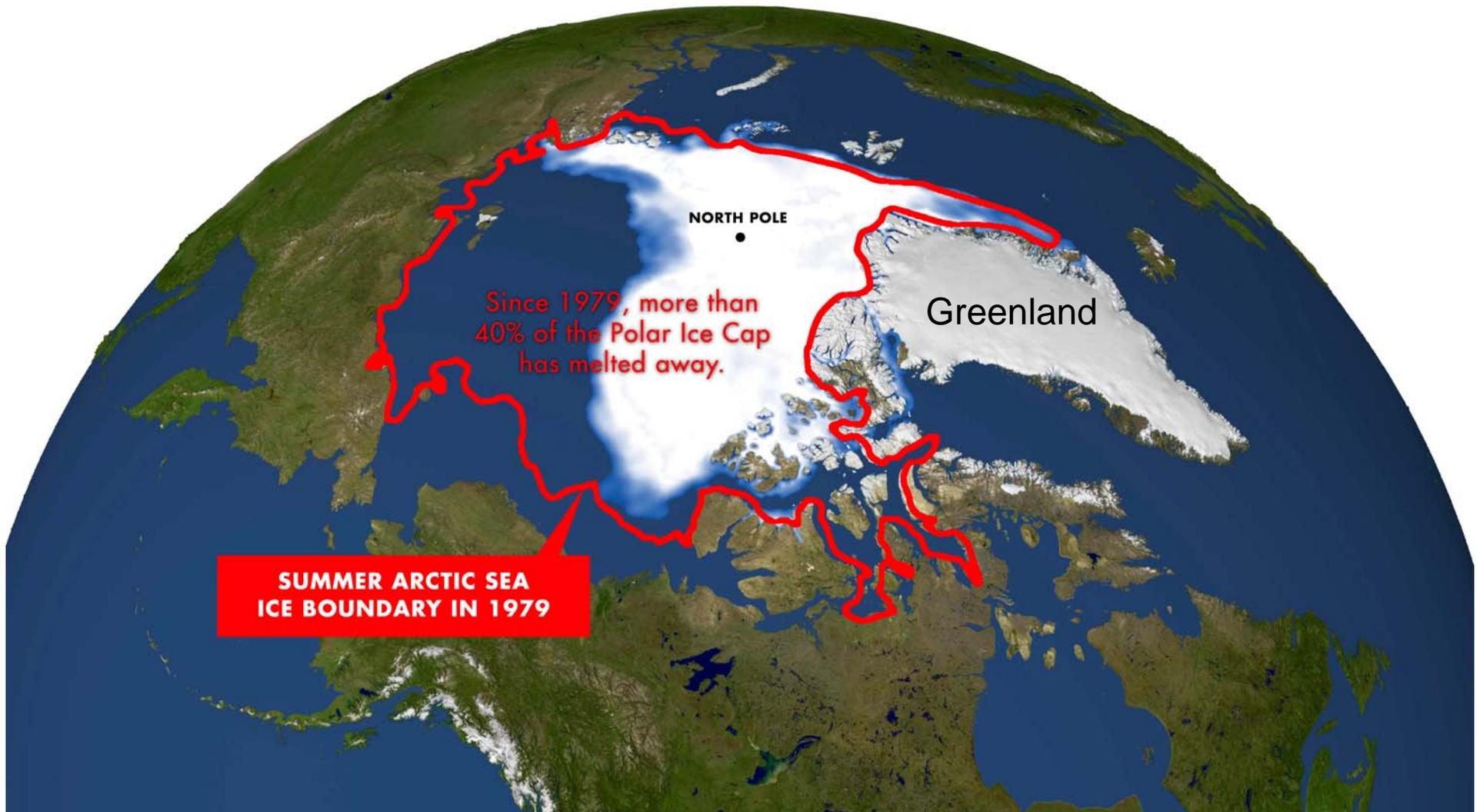
Main Points

- We must cut carbon ASAP.
- Carbon from coal will kill the climate.
- Why capture carbon?
- Politics of winning fast.
- CCS = another tool to cut carbon.
- China and India.

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Disappearing Ice Sheets



Peril for polar bears



Melting glaciers & ice sheets



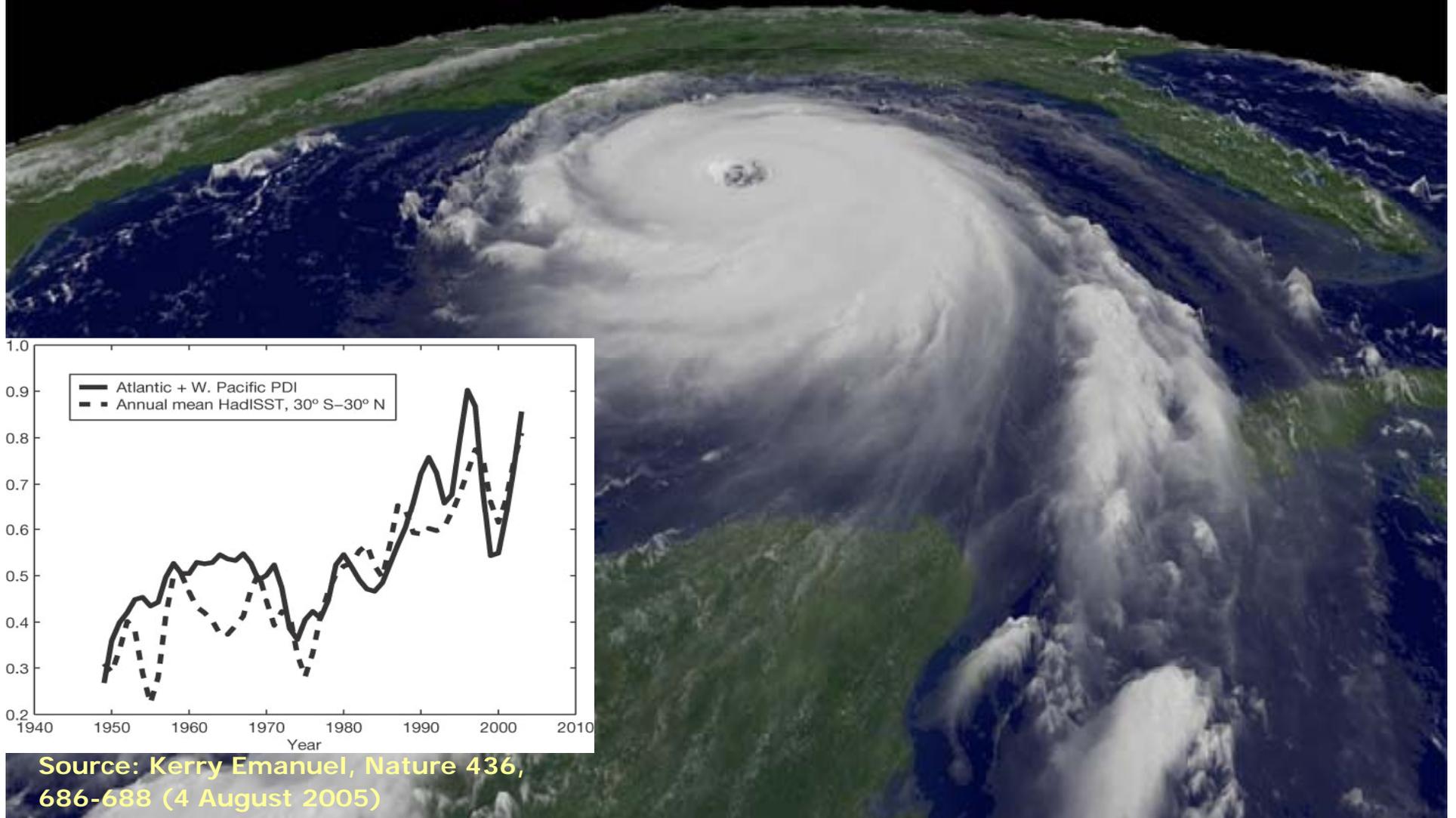
Greenland Melt Area



1992

2002

Increased Hurricane Intensity



Source: Kerry Emanuel, *Nature* 436,
686-688 (4 August 2005)

Copyright: Jeff Hicke 2004

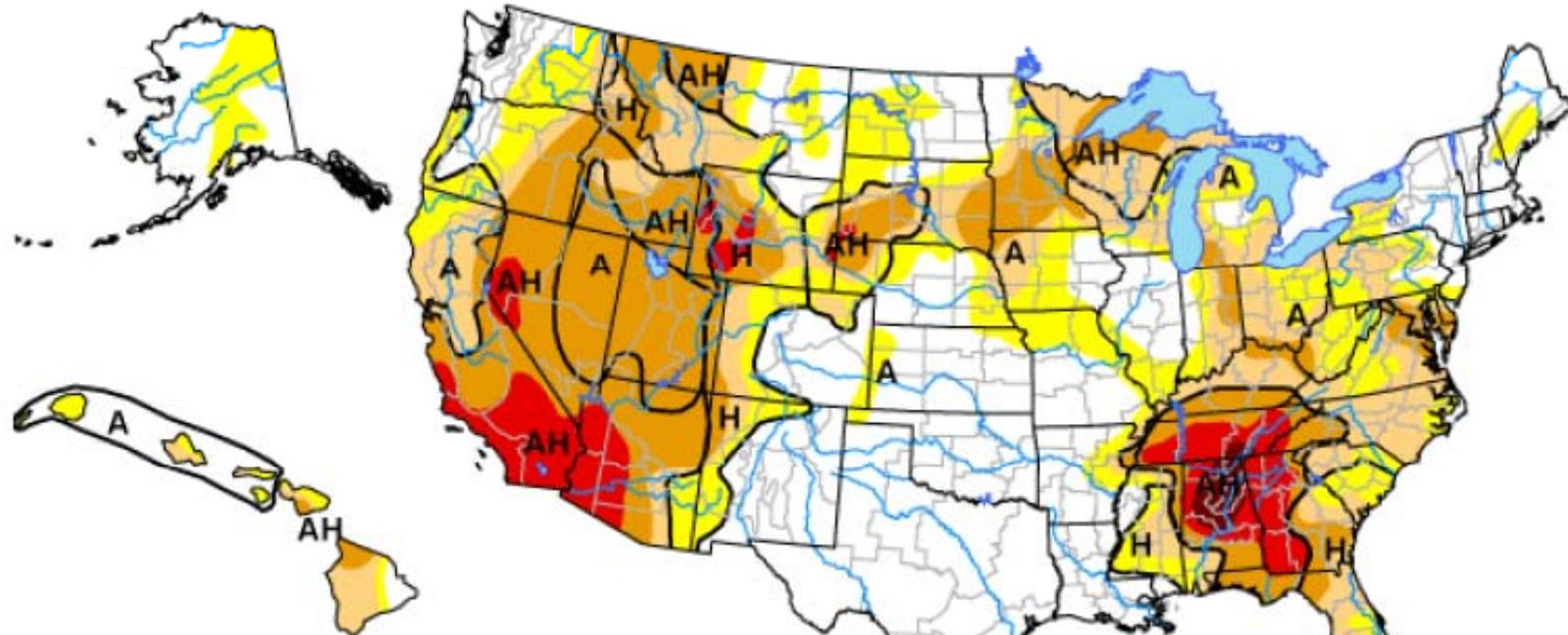
Mountain Pine Beetle Outbreak



U.S. Drought Monitor

July 31, 2007

Valid 8 a.m. EDT



Intensity:

-  D0 Abnormally Dry
-  D1 Drought - Moderate
-  D2 Drought - Severe
-  D3 Drought - Extreme
-  D4 Drought - Exceptional

Drought Impact Types:

-  Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



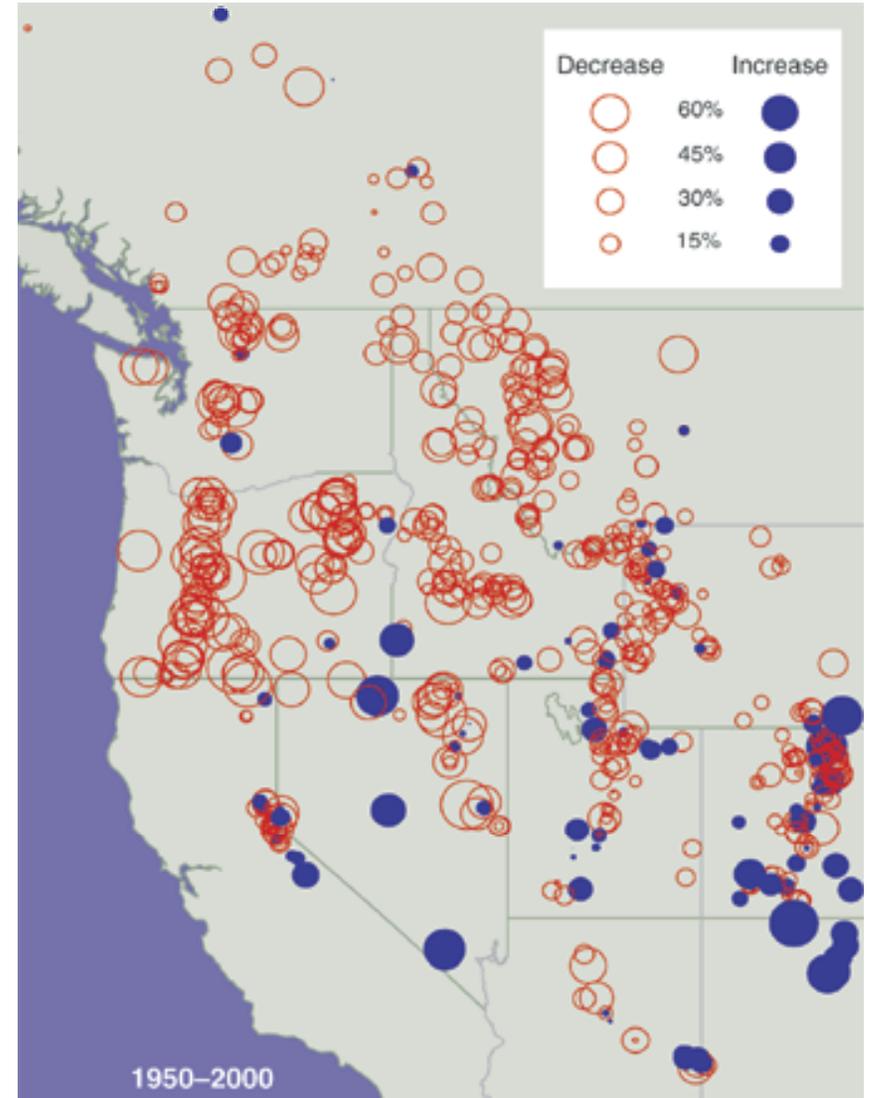
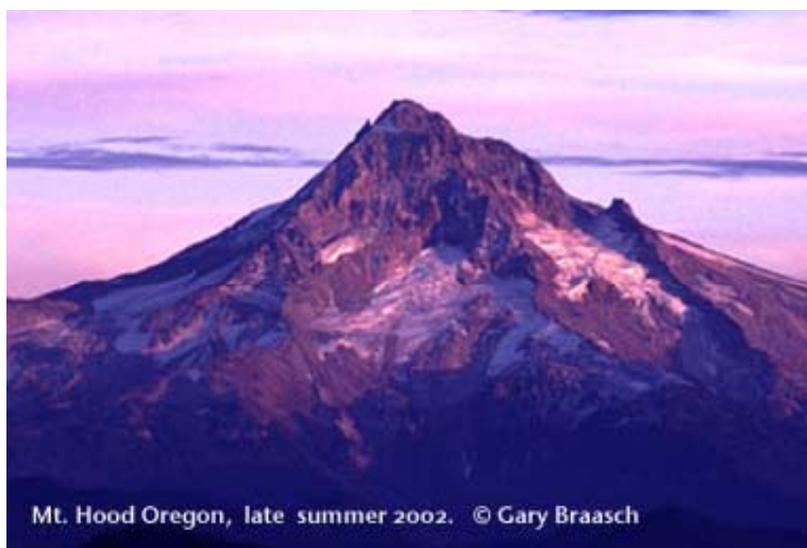
Released Thursday, August 2, 2007

Author: Brian Fuchs, National Drought Mitigation Center





Declining snowpack



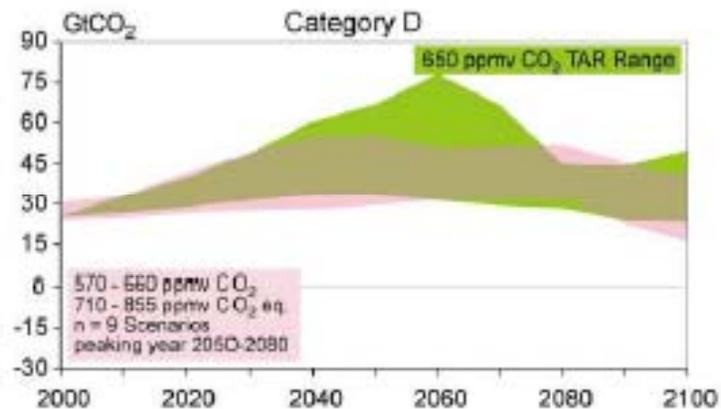
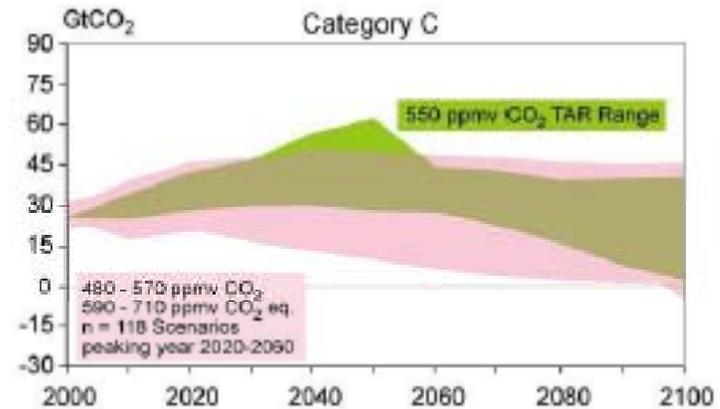
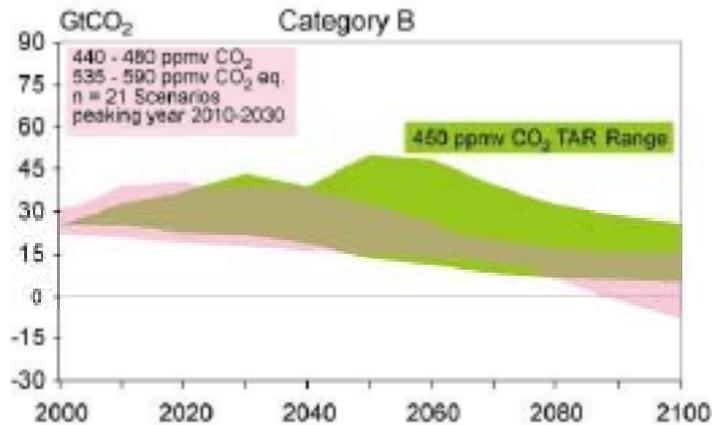
Source: P. Mote, U. of Washington

Extreme Precipitation



Tewkesbury, UK July 2007

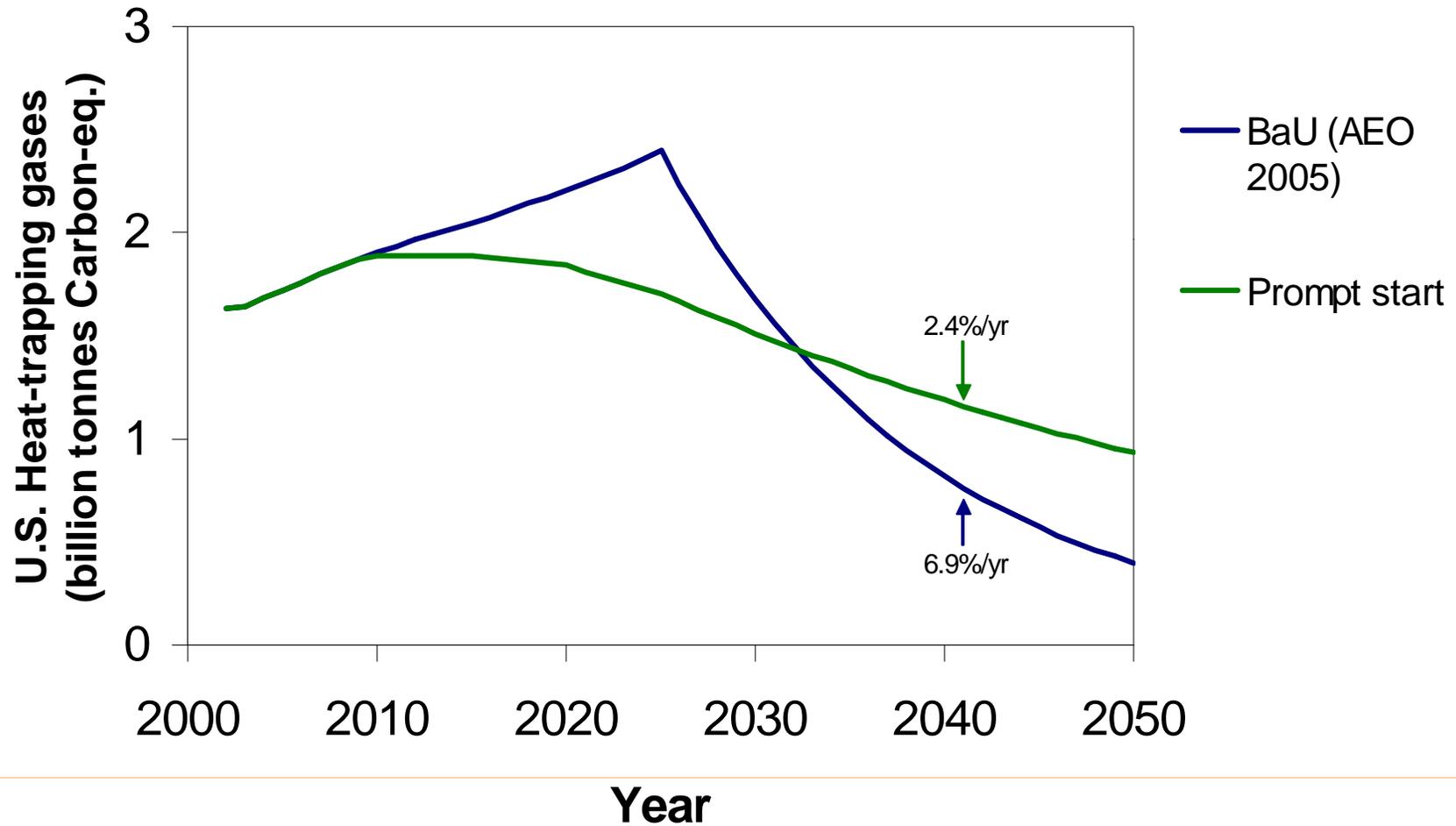
Faster Cuts Required



Source: IPCC, WG III SPM, May 2007

Delay Hurts

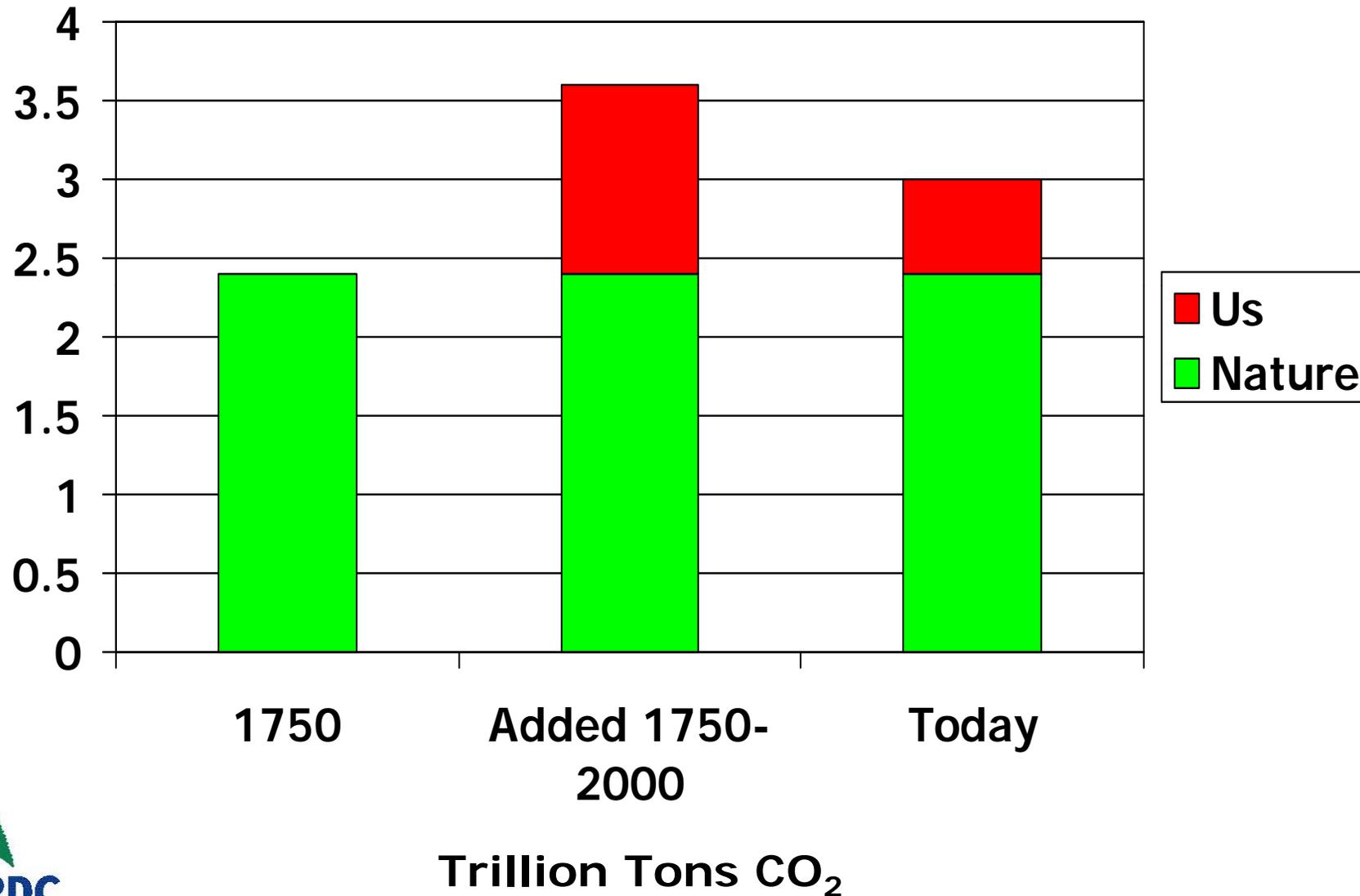
Slow Start Means Crash (...Or Burn) Finish



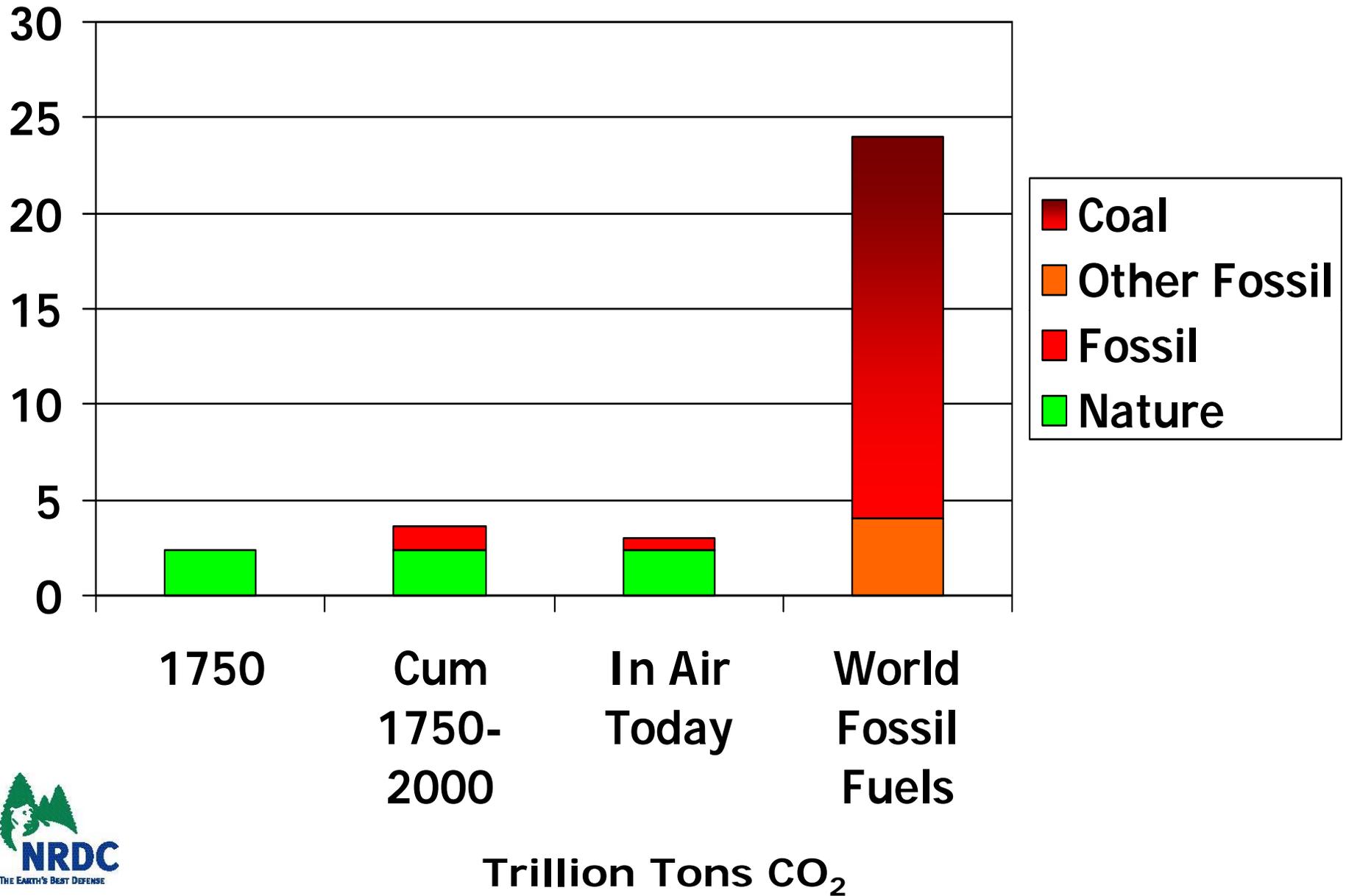
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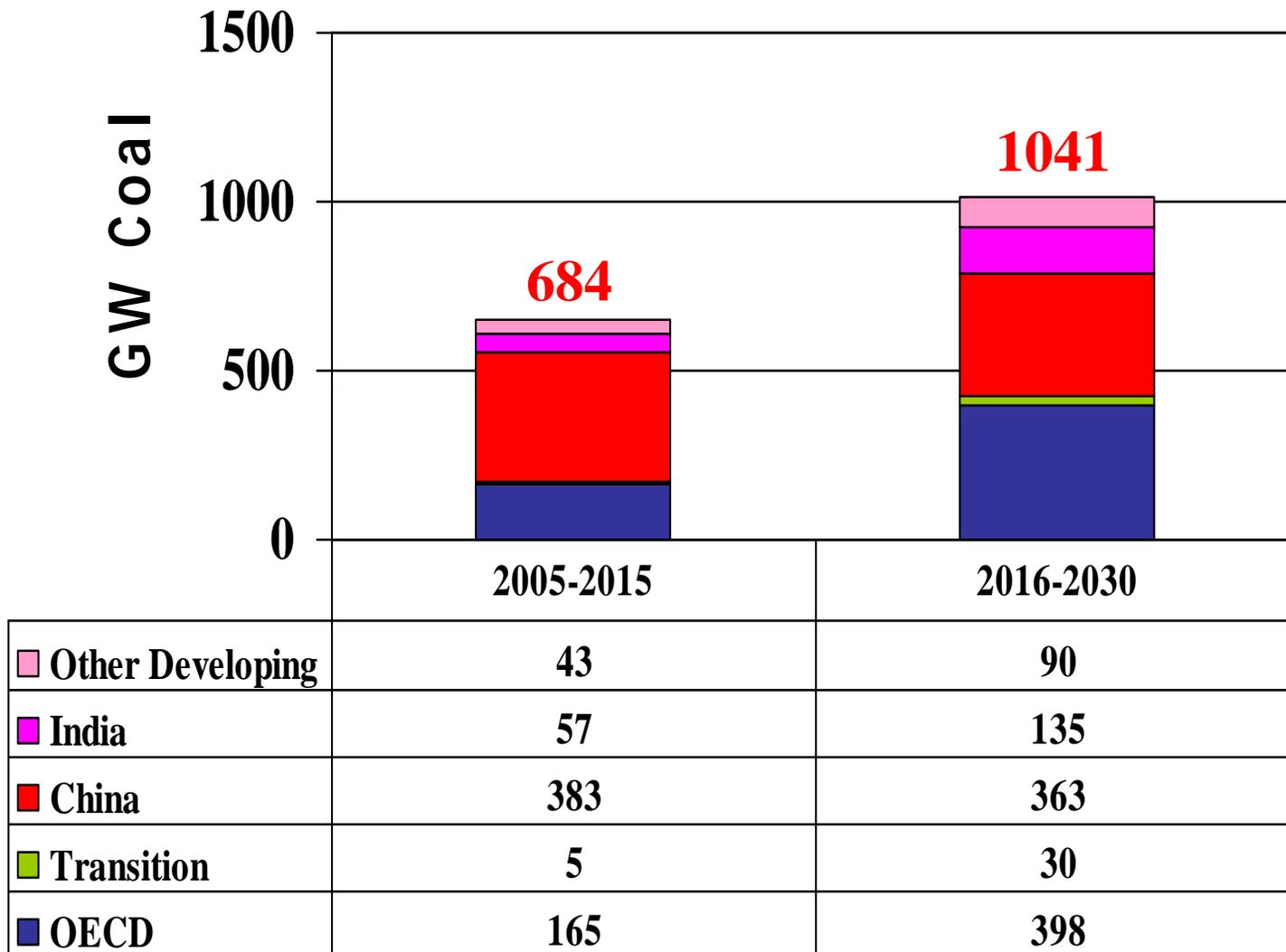
How Much Have We Added?



What Lies Ahead?



Global New Coal Build

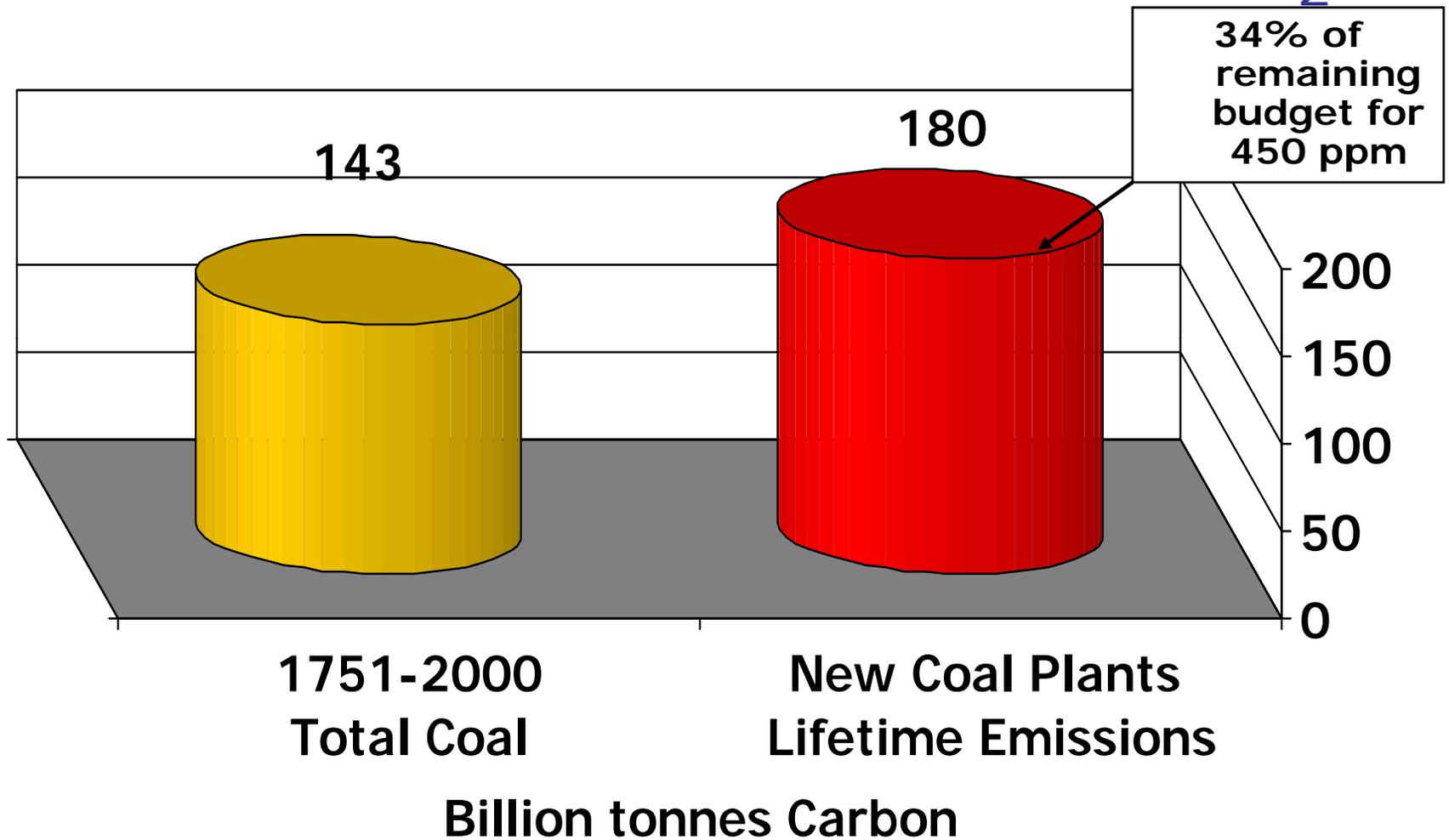


Source:
IEA,
WEO 2006



Incremental new coal capacity

New Coal Plant Emissions 26% Greater than All Historic Coal CO₂



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Addressing the Coal Threat

- Two approaches:
 - Eliminate coal use ASAP.

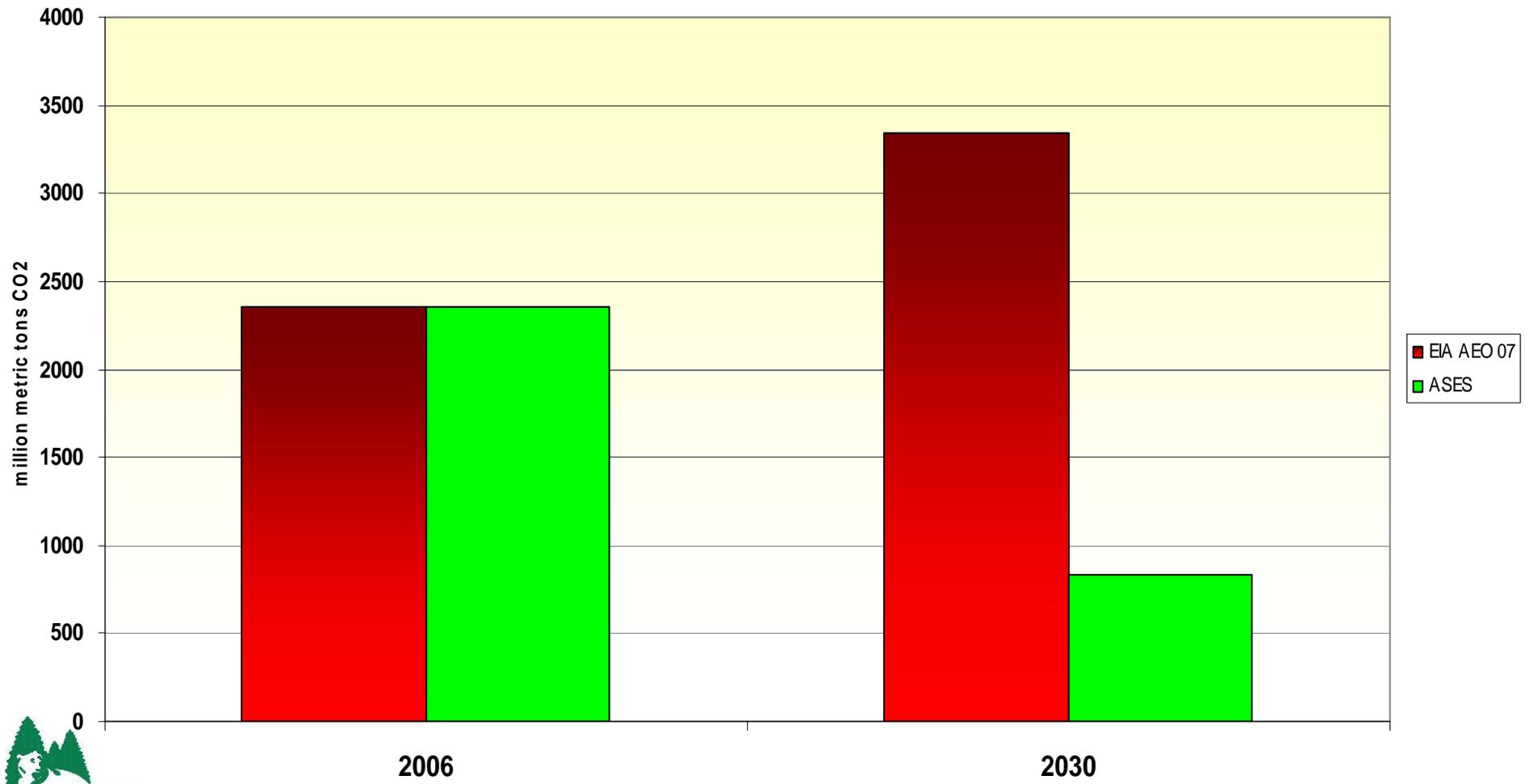
or

- Reduce dependence on coal fast AND capture carbon from the coal that IS used.

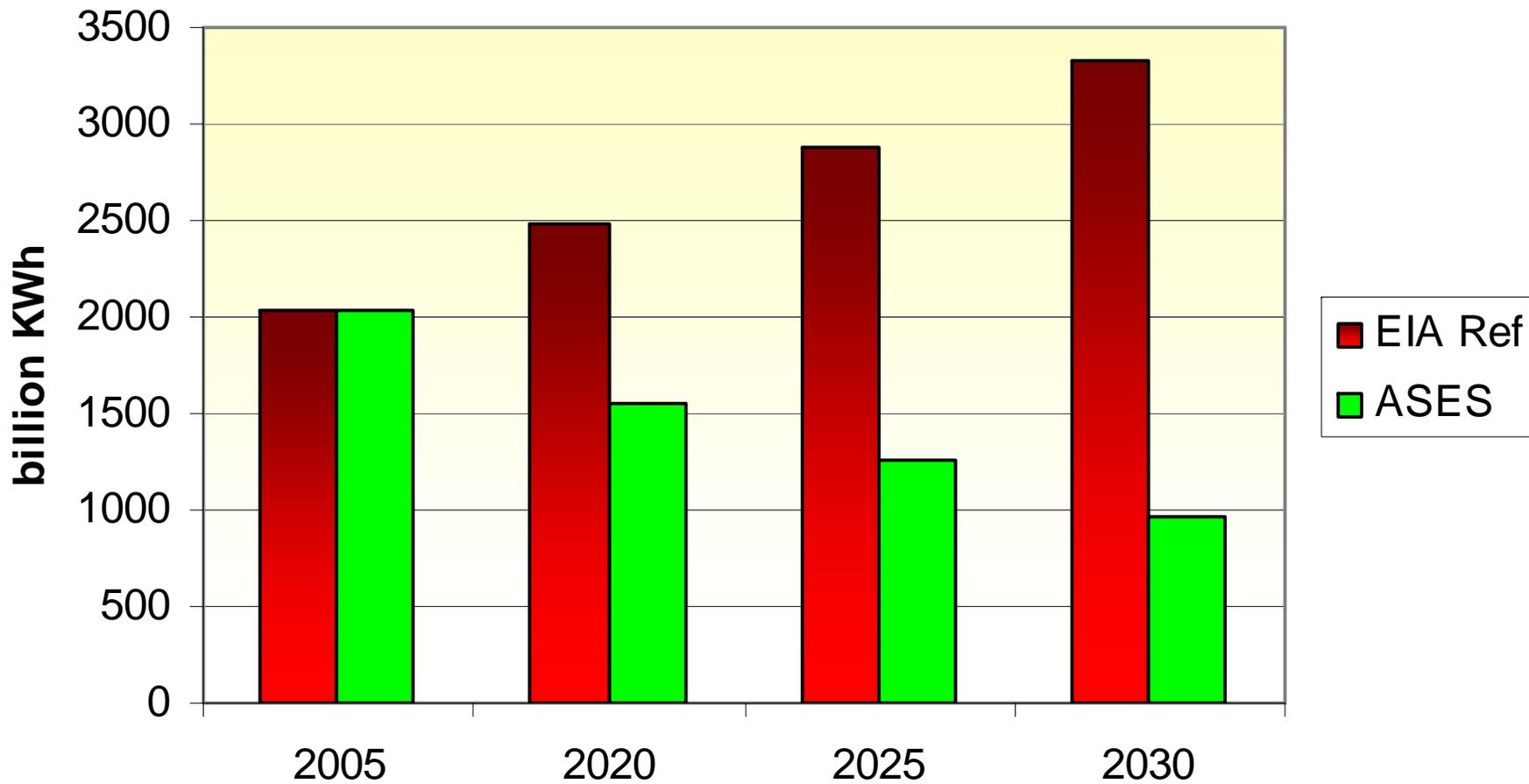
EERE Path

Power Sector CO₂ Emissions

Total US Power CO₂: EIA v ASES



Coal Gen EIA Ref v ASES



Main Points

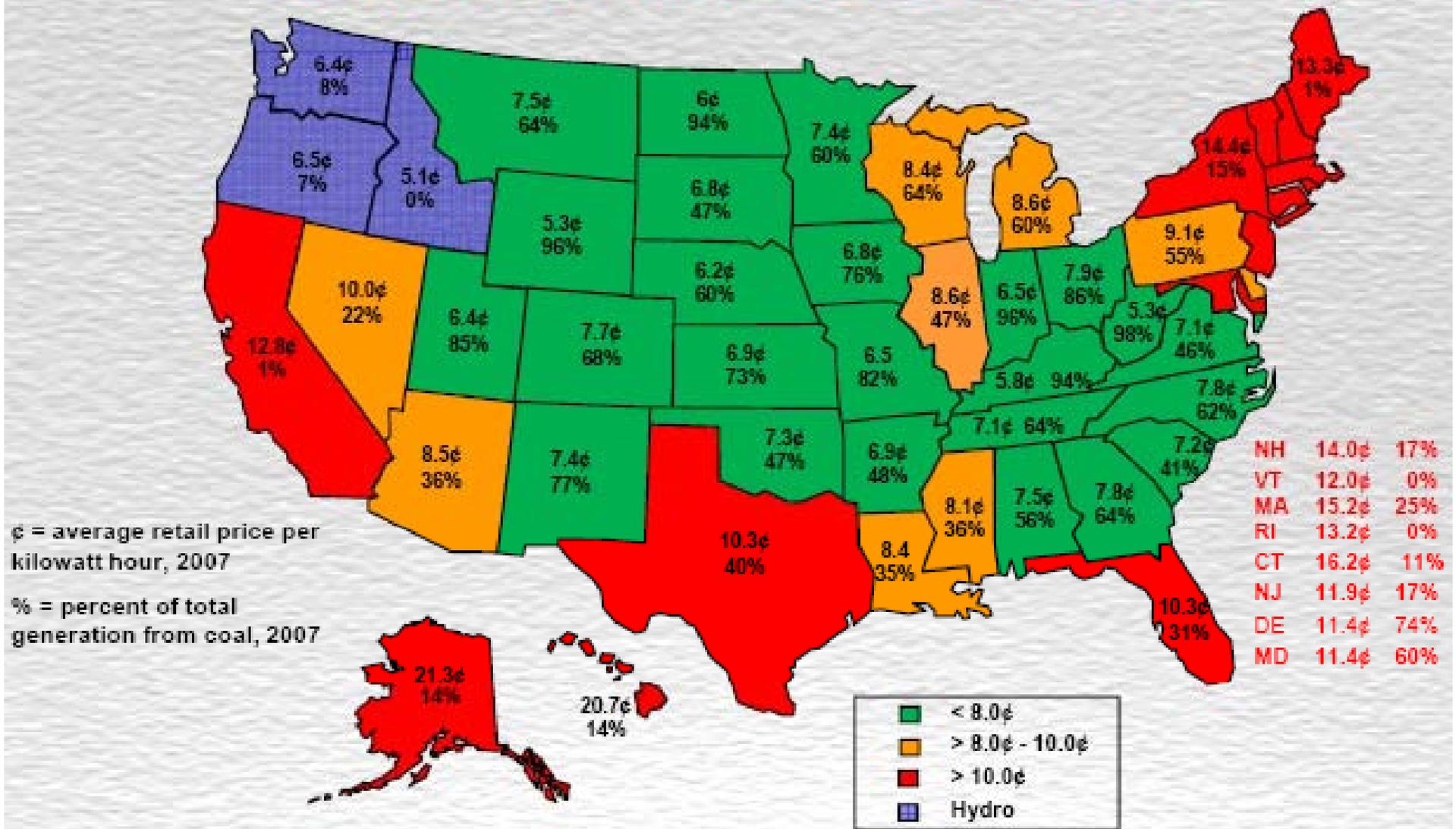
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Democrats Questioning Boxer Bill

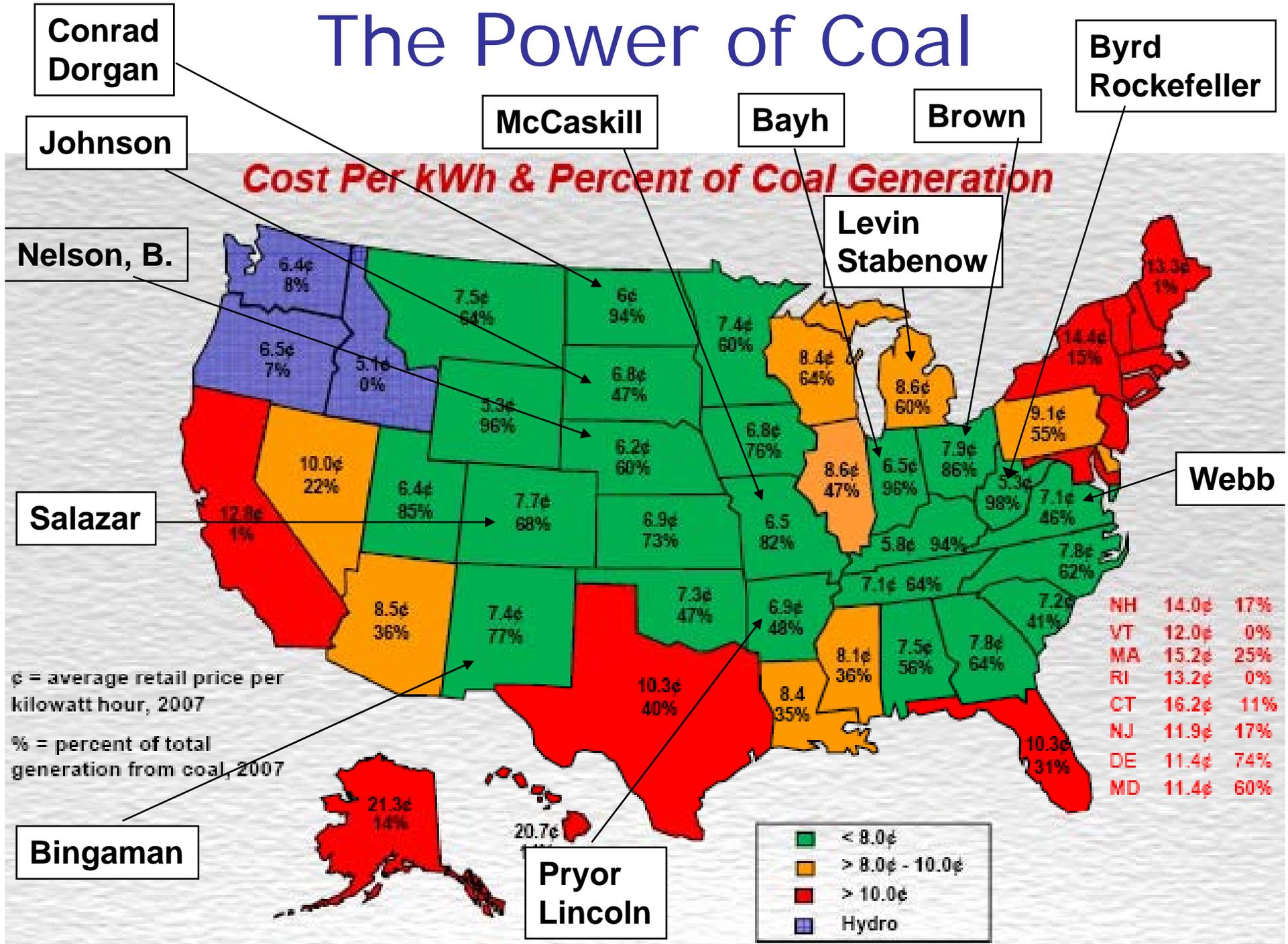
- Bayh
- Brown
- Levin
- Lincoln
- McCaskill
- Nelson, B.
- Pryor
- Rockefeller
- Stabenow
- Webb
- Bingaman
- Byrd
- Conrad
- Dorgan
- Johnson
- Salazar

The Power of Coal

Cost Per kWh & Percent of Coal Generation



The Power of Coal



Coal and the Senate

West Virginia

Indiana

Wyoming

Utah

North Dakota

Kentucky

New Mexico

Ohio

Missouri

Iowa

Delaware

Colorado

Kansas

Wisconsin

Georgia

Tennessee

Minnesota

Michigan

Nebraska

Maryland

Texas

Pennsylvania

Illinois

Alabama

North Carolina

Montana

Virginia

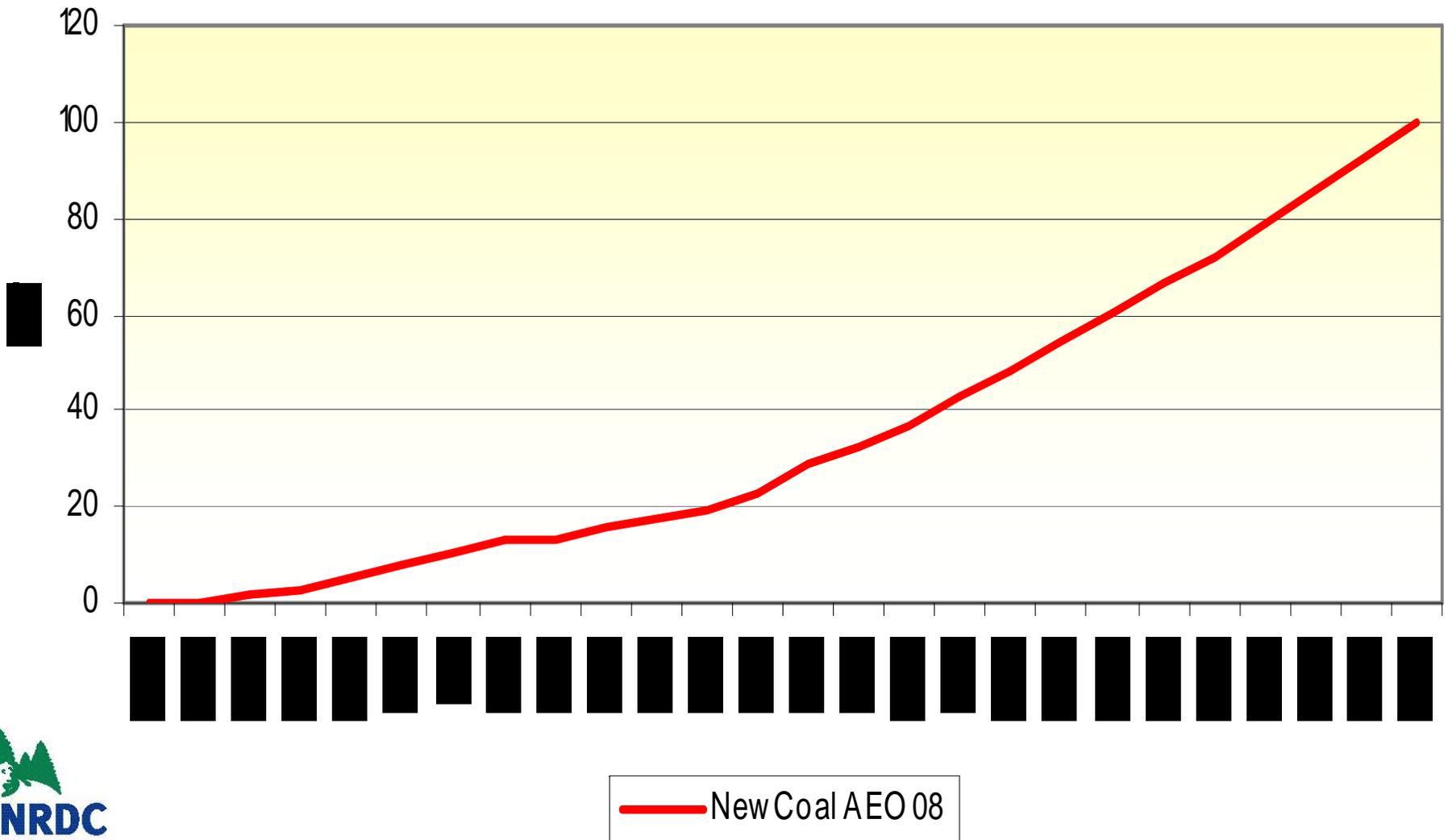
Arizona

South Dakota

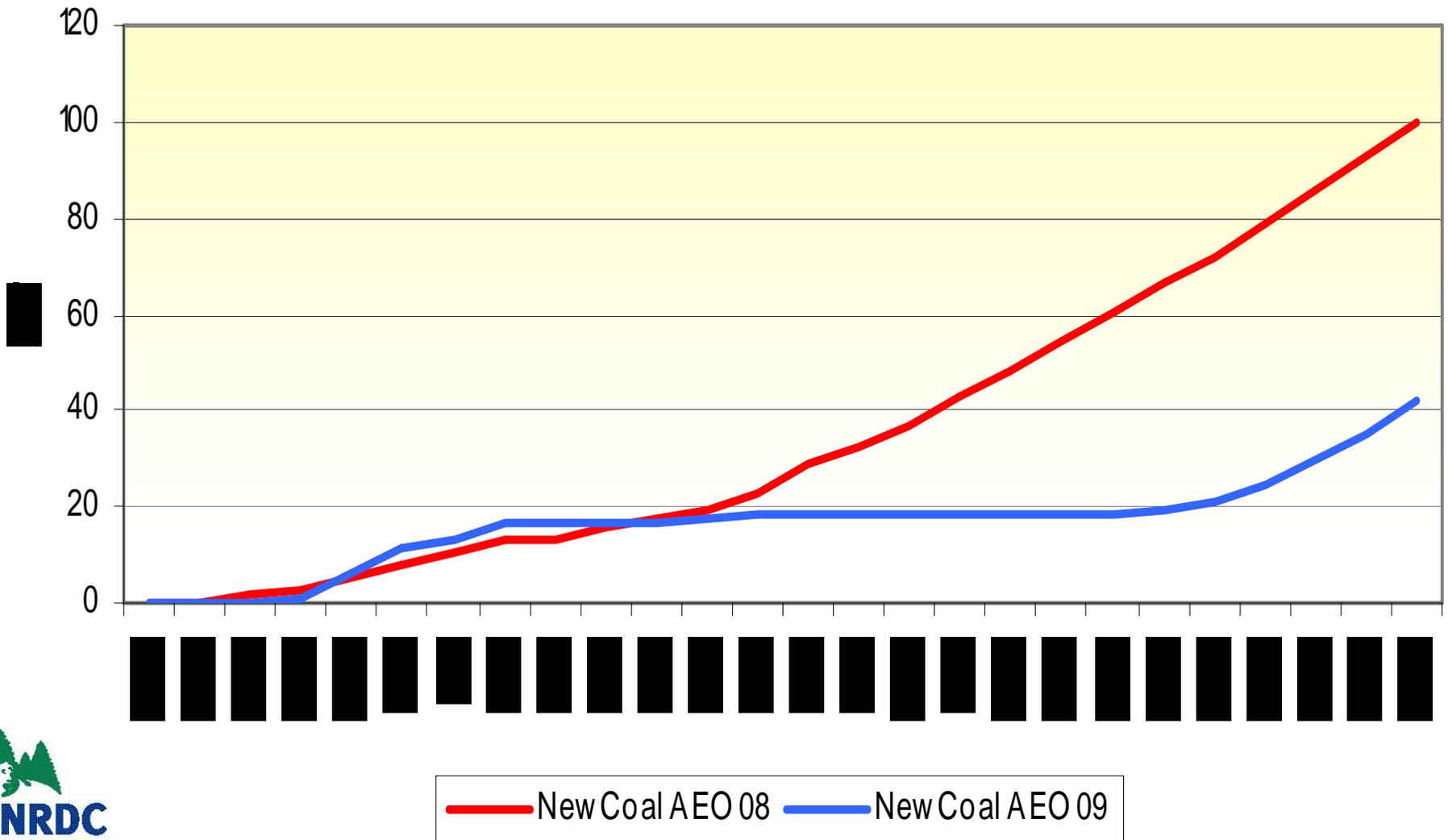
Mississippi



U.S. New Coal Build?



U.S. New Coal Build?

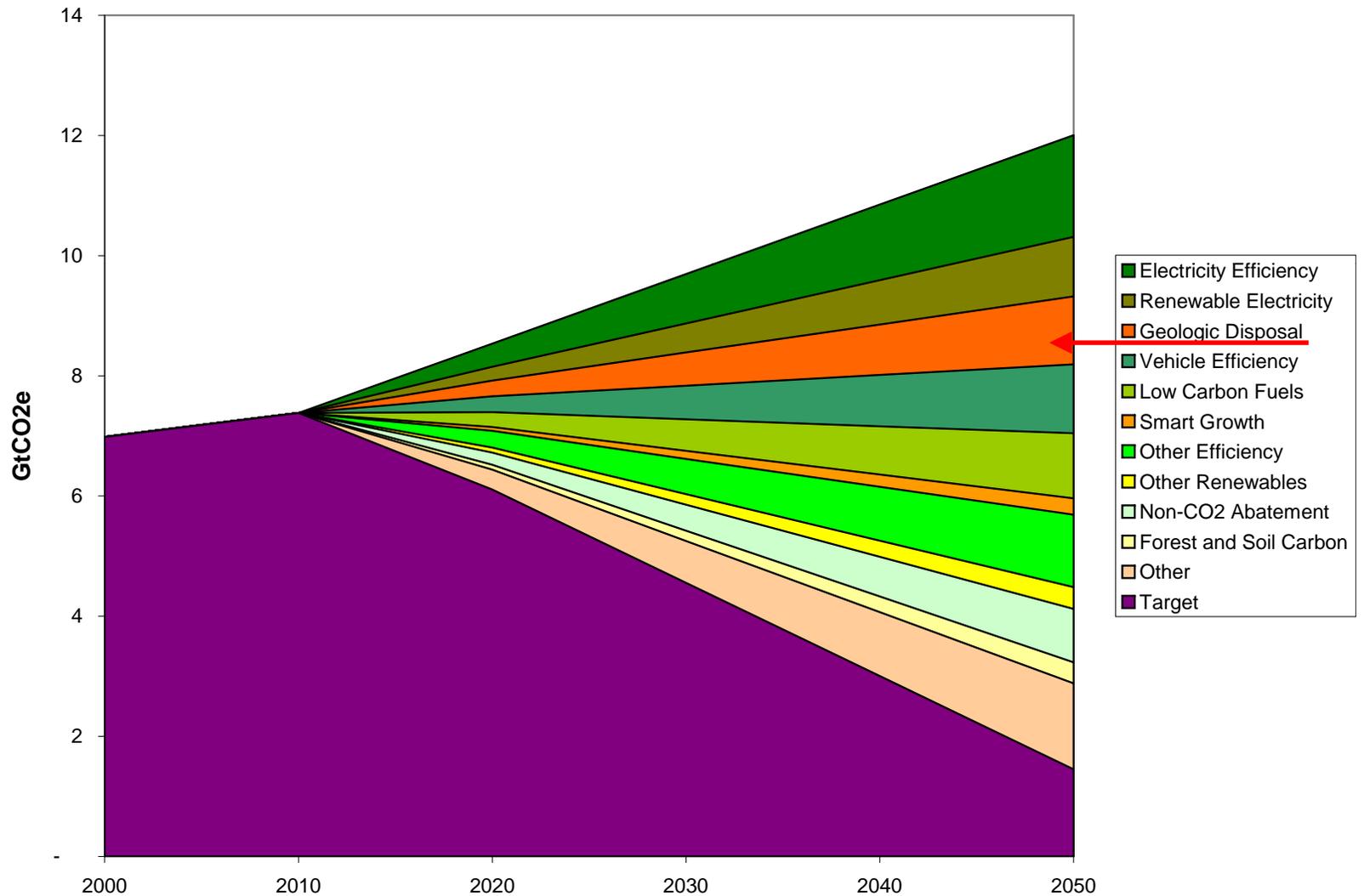


— New Coal AEO 08 — New Coal AEO 09

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NRDC Stabilization Wedges: High Efficiency and Renewables Scenario



CCS Can Get Deeper Cuts

- Back out oil with Plug-in Hybrids and power with CCS. Near-zero carbon with coal; negative carbon with biomass.
- Back out more oil with less land use using biofuels and CCS. Negative carbon fuel.
- Use biomass and CCS for negative carbon power.

POLICY

4-Part Deployment Program

- National GHG Cap
- Fleet-wide standard: low-carbon generation obligation (tradable requirement to generate low-carbon kwh from coal).
- New plant performance: NSPS.
- Financial Incentives: direct payments for injected CO₂ (funded by allowance value).

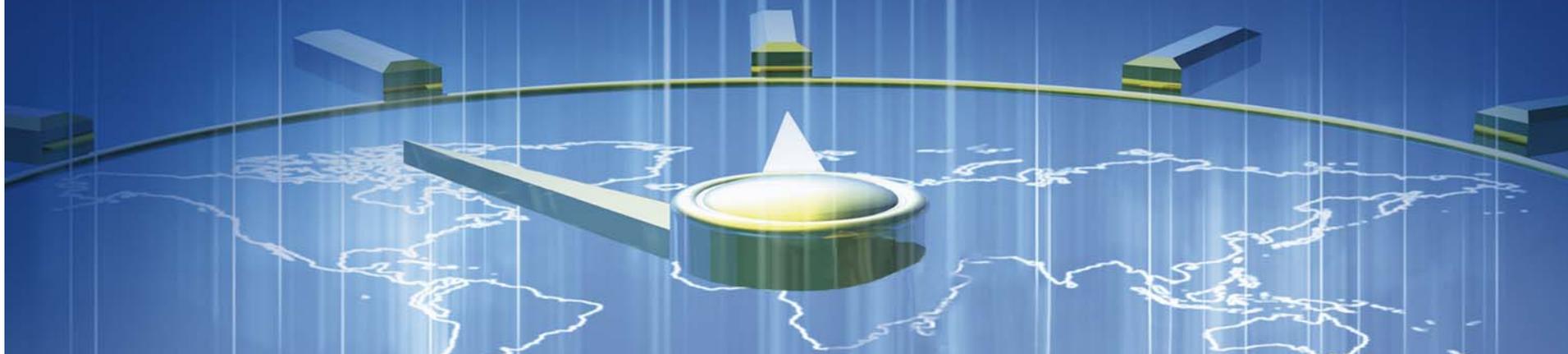


USCAP

United States
Climate Action
Partnership

BLUEPRINT

FOR LEGISLATIVE ACTION



Diverse Voices Represented

Member Organizations:



BLUEPRINT
FOR LEGISLATIVE ACTION

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INTERNATIONAL
ENERGY AGENCY

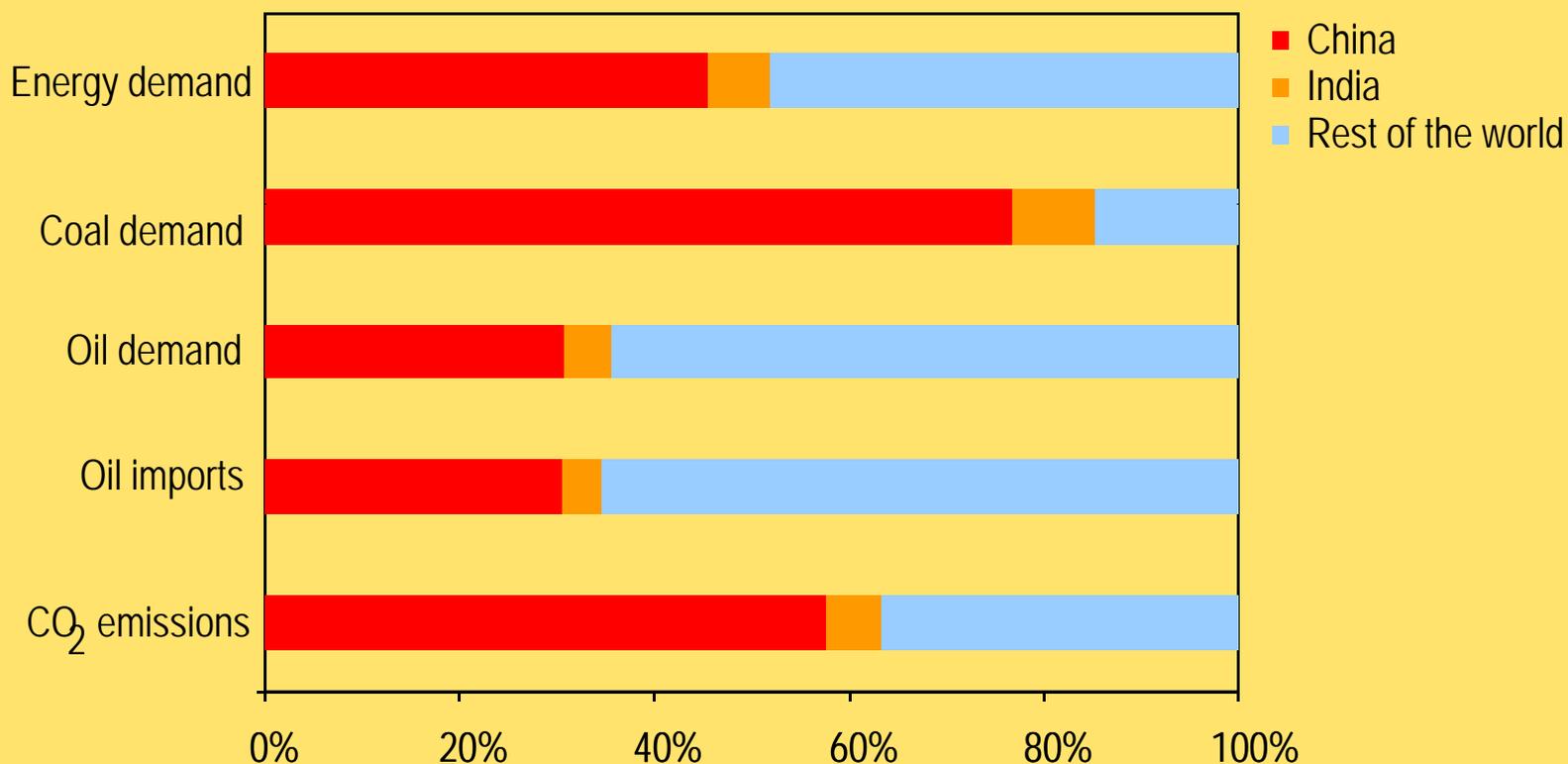
WORLD
ENERGY
OUTLOOK
2007

China
and India
Insights

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Why Focus on China & India?

Increase in World Primary Energy Demand, Imports & Energy-Related CO₂ Emissions in the Reference Scenario, 2000-2006



China & India have contributed more than half of the increase in global demand for energy and over 80% for coal since 2000



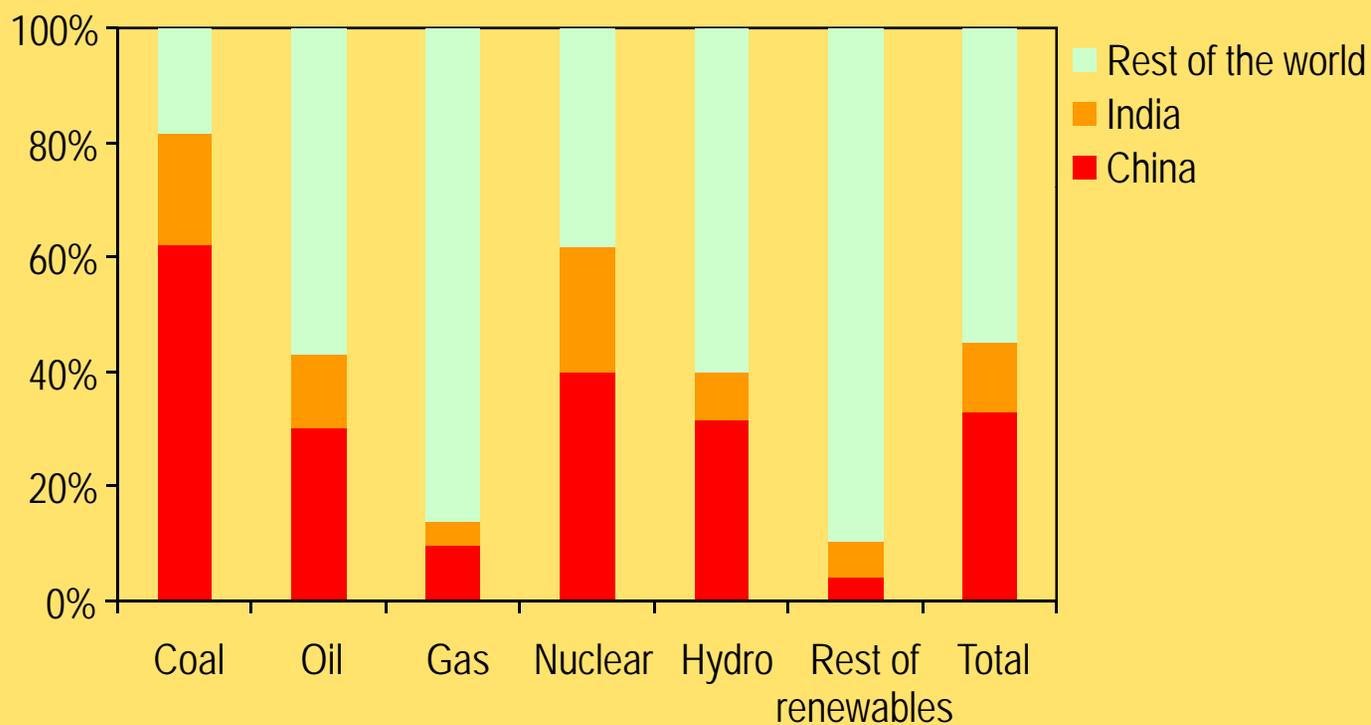
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Reference Scenario: Increase in World Primary Energy Demand, 2005-2030



China & India will contribute about 45% of the increase in global energy demand to 2030 on current trends



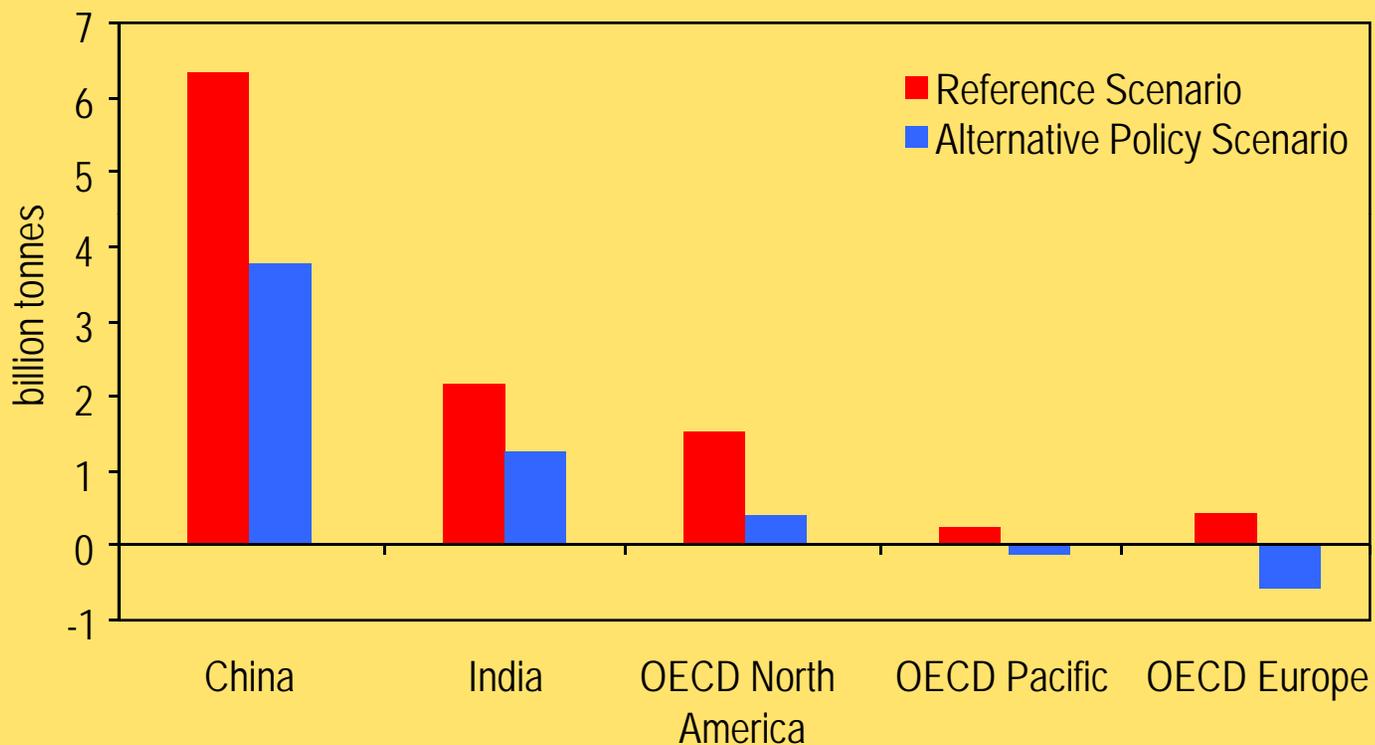
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Incremental Energy-Related CO₂ Emissions, 2005-2030



Most of the increase in emissions are projected to come from China & India in all scenarios

Questions about CCS

- Is it safe?
- Will it leak?
- Will it prolong damages from coal use?
- Will it crowd out efficiency and renewable energy?
- Will it speed or delay GHG emission cuts?

It's Not Just About CO₂



Warming won't wait. Will we?

