

Preventing Carbon Lock-in



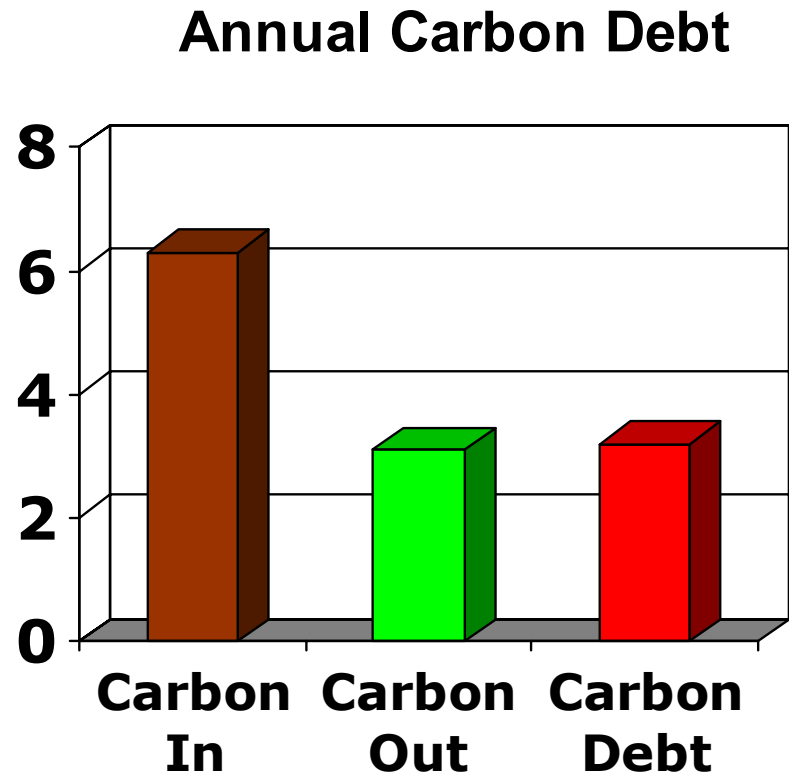
David G. Hawkins, NRDC
Robert H. Williams, Princeton
January 2005

Investments Today Drive Impacts Tomorrow

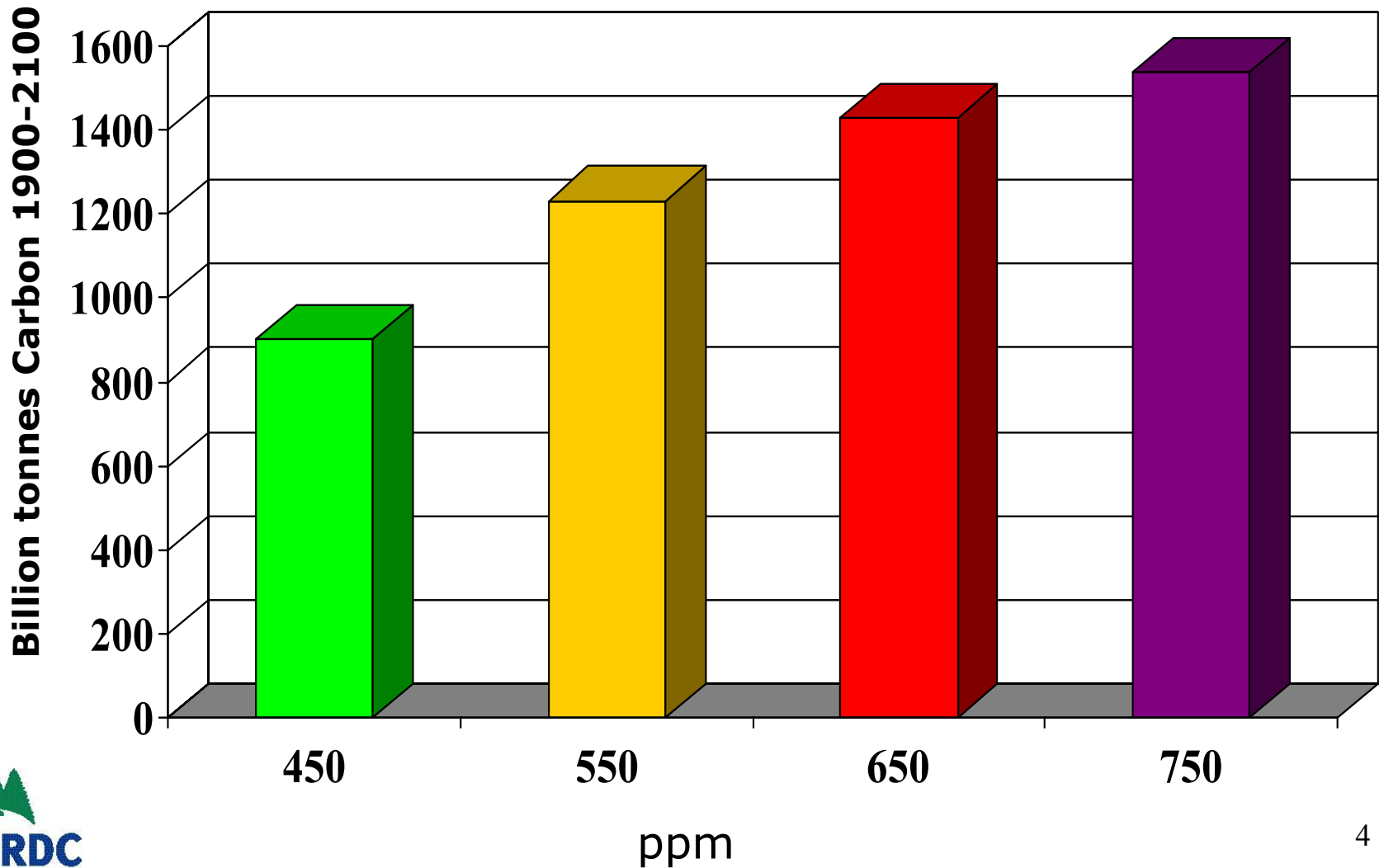
- Temperature forcing drives impacts
- Concentrations drive forcing
- Emissions drive concentrations
- Investments drive emissions

Carbon Deficit Spending— Do the Math

- **Energy carbon emissions in year 2000 = 6.3 billion metric tons**
- **Removal to oceans, soils, trees = 3.1 billion metric tons**
- **Net buildup in air = 3.2 billion metric tons**

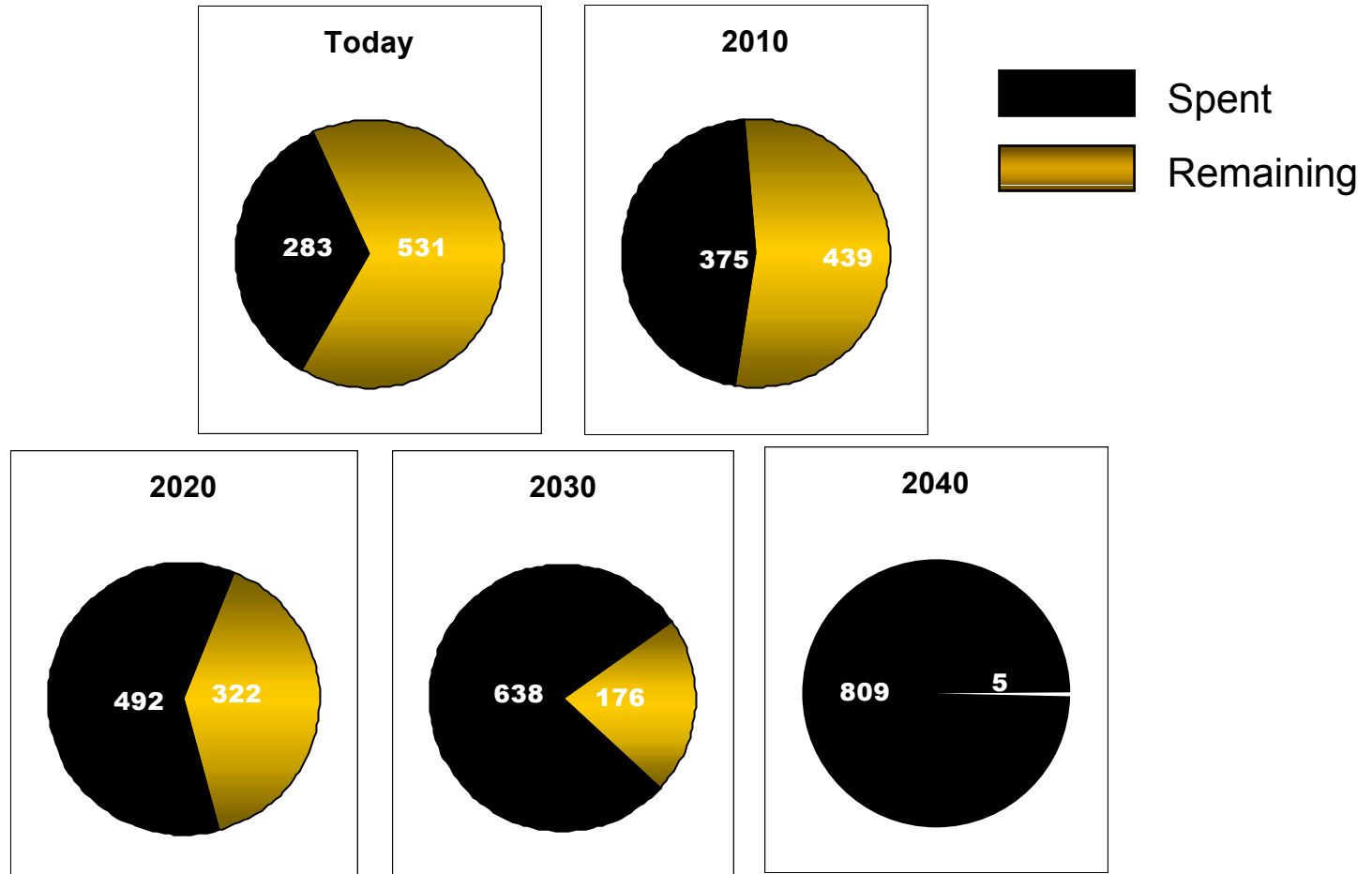


Emissions Drive Concentrations



The Budget is Disappearing

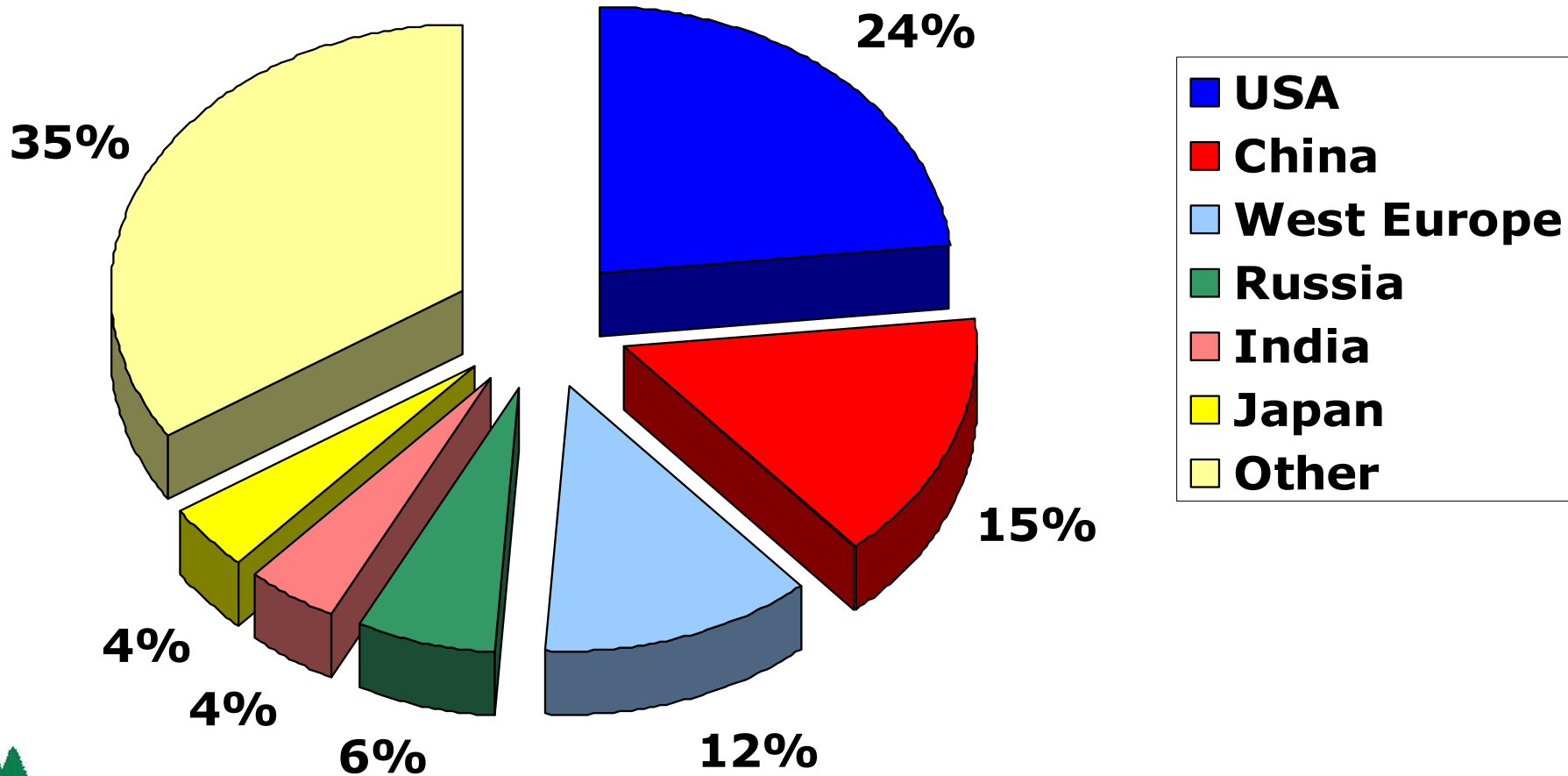
Cumulative carbon emissions 1900-2100 (GtC)



Budget for 450 ppm Stabilization

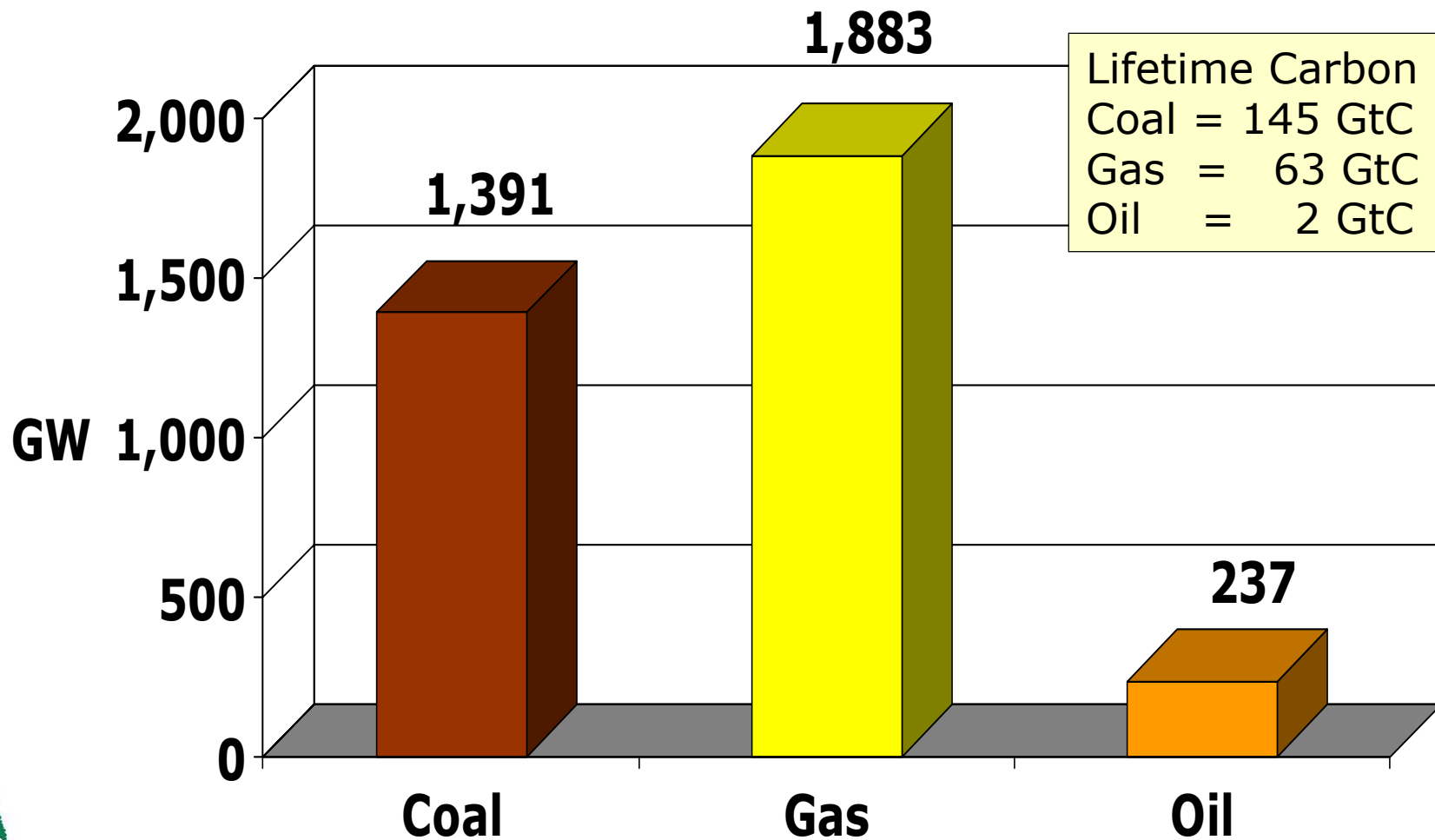
Biggest Emitters 2000-2025

Top six = 66%

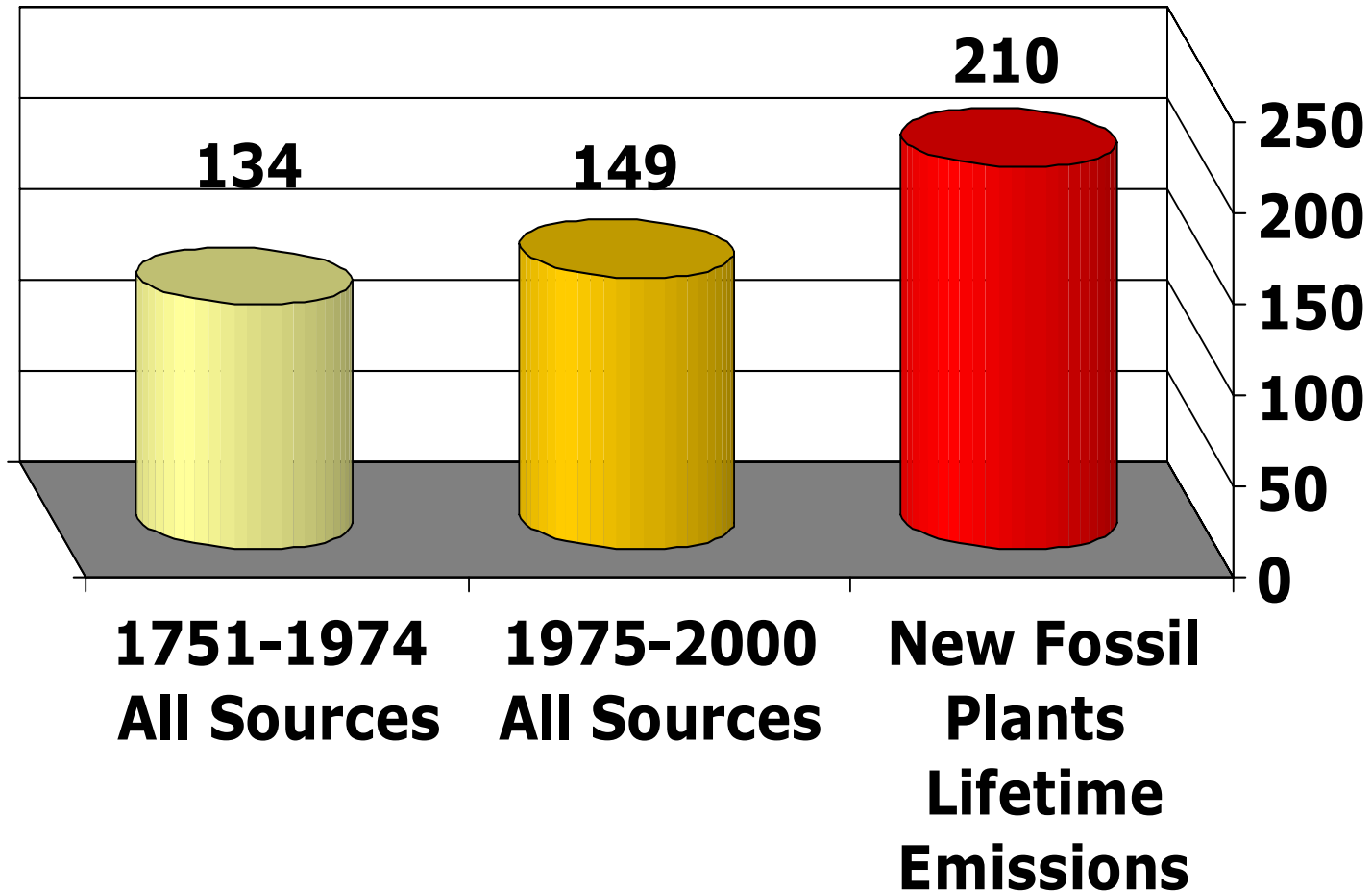


Carbon Lock-in

New Fossil Units 2003-2030

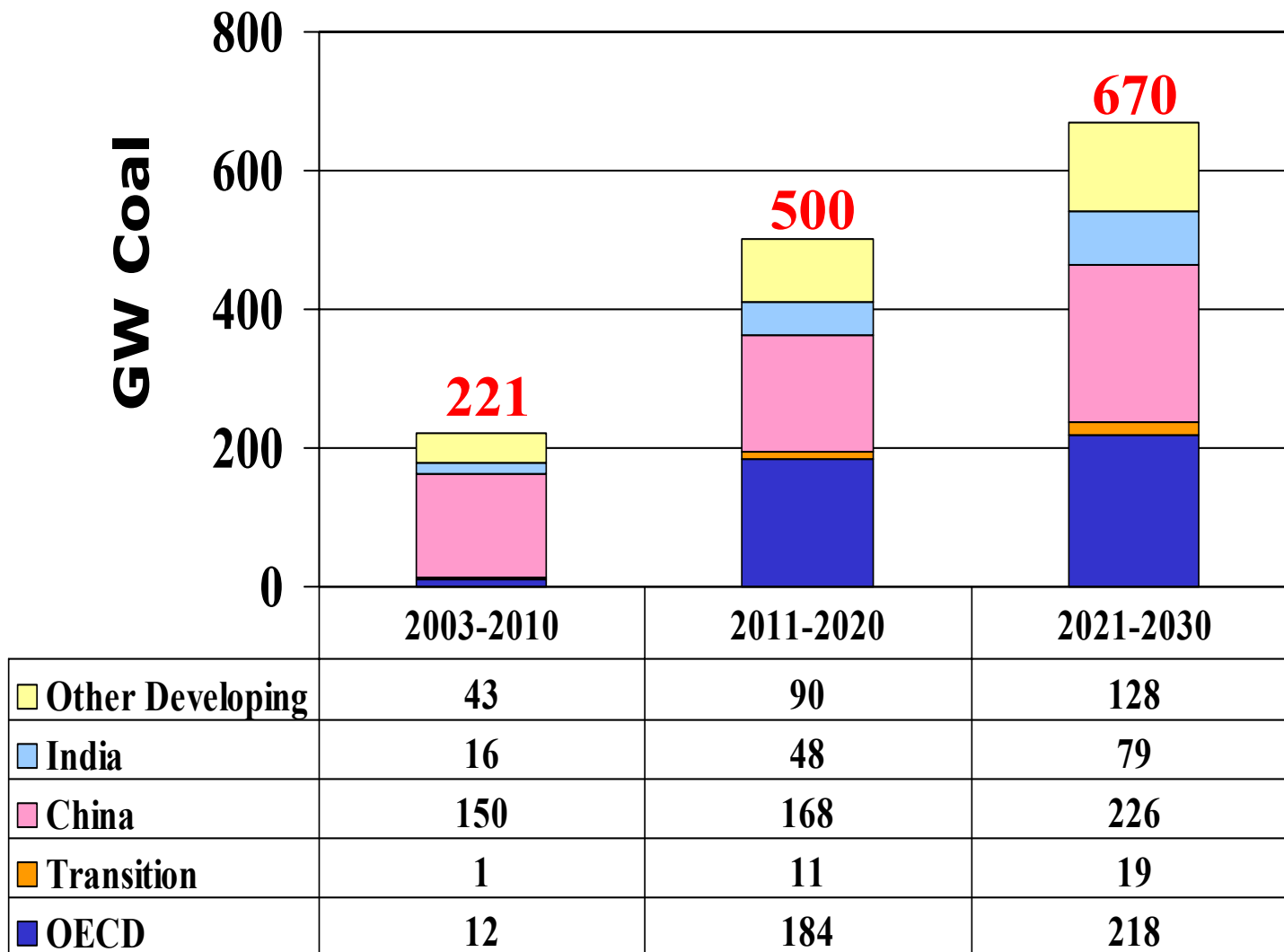


New Fossil Plant Emissions Rival Historic Totals



Billion tonnes Carbon

New Coal Build by Decade



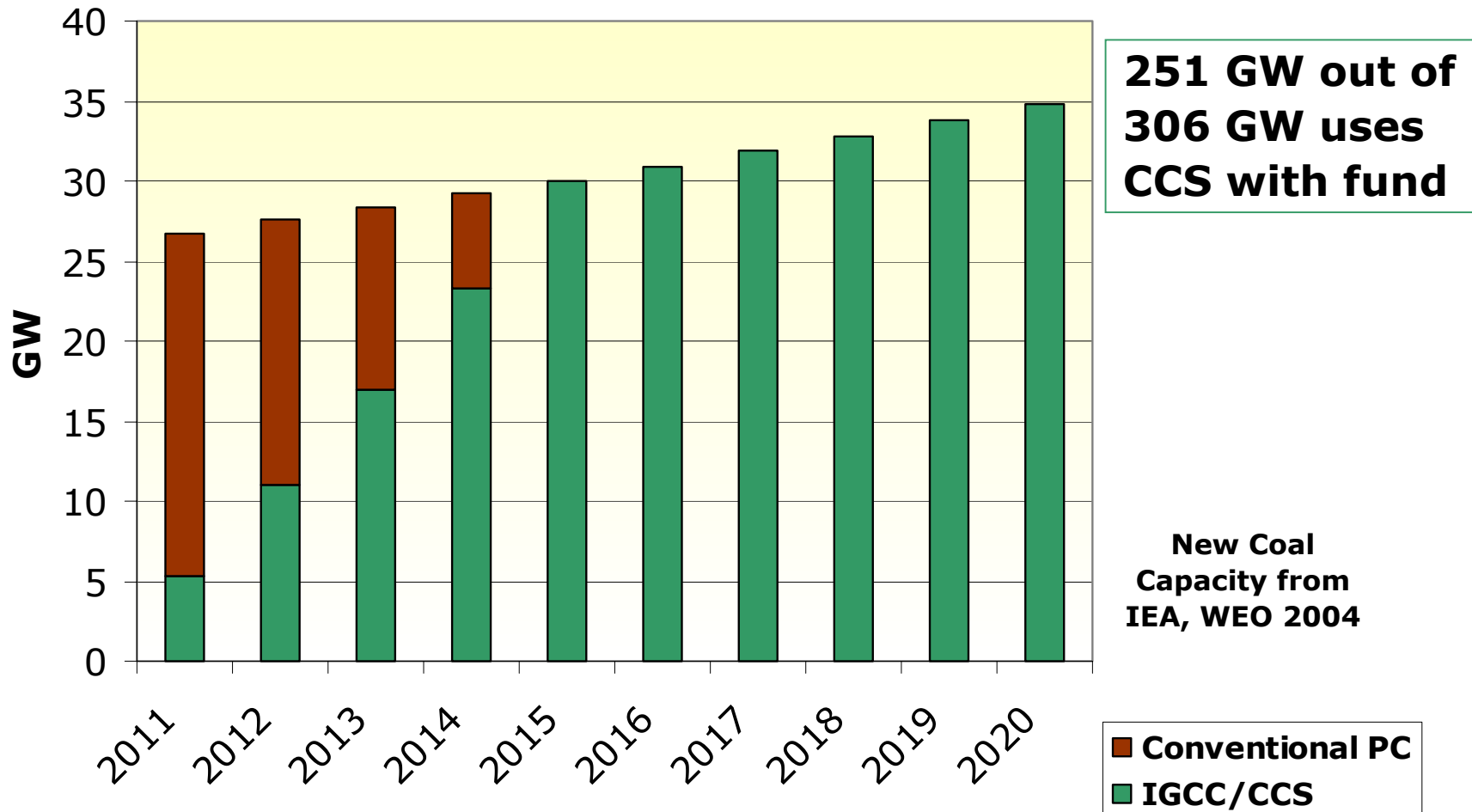
Source:
IEA,
WEO 2004

Incremental new coal capacity by decade

Fund CCS for New Coal in Developing Countries

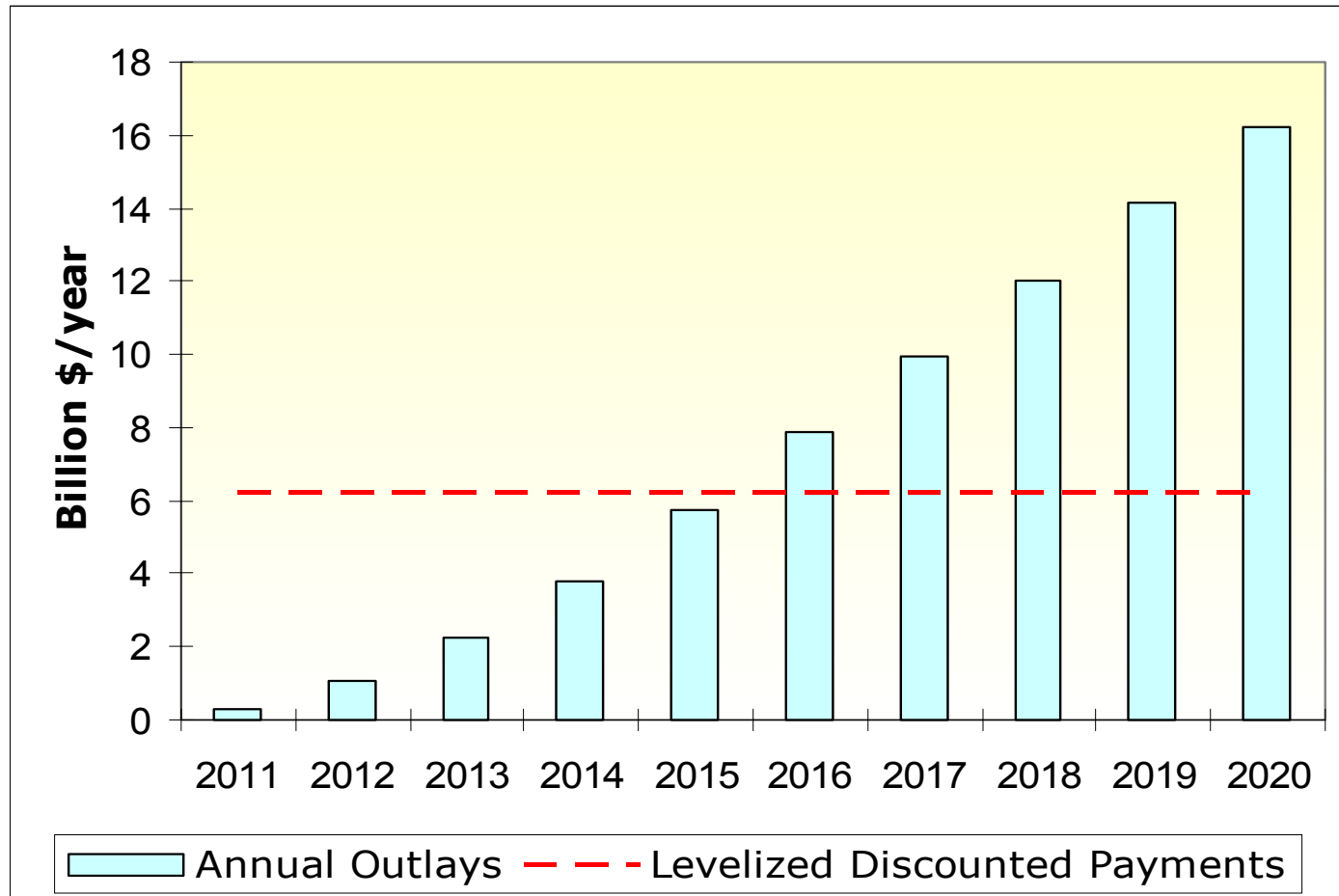
- Industrialized countries (Annex II, OECD, G8, G8+) agree to finance incremental costs of IGCC with CCS for 10 years (2011-2020) in developing countries.
- Ramp in coverage: 2011=20% of new build; 20% increase each year.
- Cover full incremental cost of electricity (levelized capital and operating costs) for IGCC/CCS to 2020.

Funding CCS for New Coal in Developing Countries



Costs of CCS Fund

- Levelized discounted costs = \$6.2 billion/yr
- Compare 2003 G7 ODA = \$50 billion
- But compare GEF = \$3 billion for four yrs.



Costs derived from Foster Wheeler Study for IEA GHG Programme, May 2003

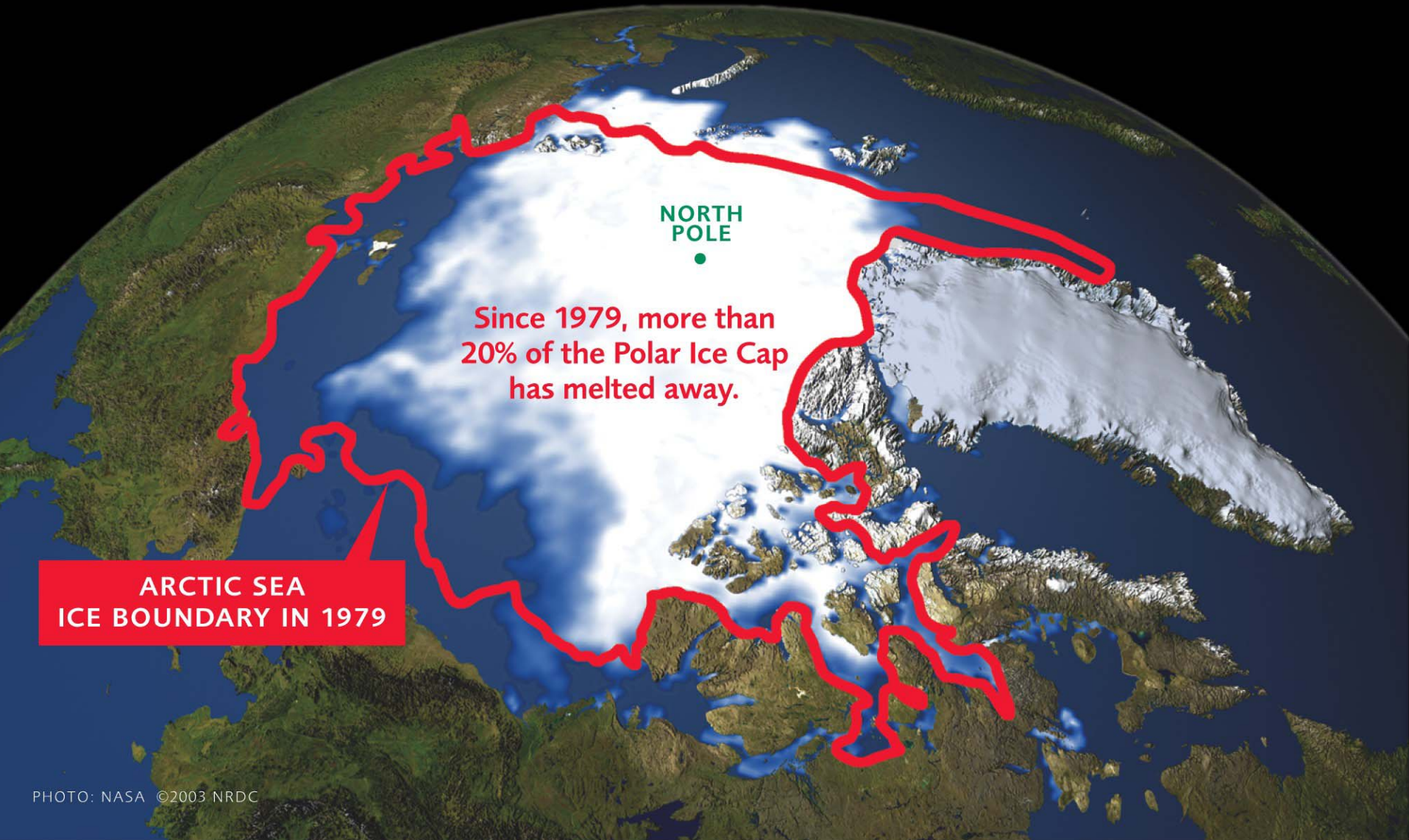
What About Industrialized Countries?

Applying the same CCS deployment schedule in industrialized countries results in 160GW of CCS capacity (out of 200GW coal forecast) with added costs of \$3.9 billion per year.

Costs in Context

- \$6.2 billion per yr = 0.5 mills/kwh if applied to OECD generation. (\$10.1 billion global program = 0.8 mills/kwh)
- Combining CCS fund with efficiency initiative can reduce costs and emissions more. If demand growth is cut from 3%/yr to 2.5%, CCS LDC program costs drop to \$5.1 billion per yr.
- Enables avoidance of 36 billion tonnes carbon emissions just from initial covered capacity; much more with spillover benefits.

Warming Won't Wait. Will We?



Since 1979, more than
20% of the Polar Ice Cap
has melted away.

ARCTIC SEA
ICE BOUNDARY IN 1979