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CCS - an uncomfortable but necessary option

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WWF International - European Policy Office
Brussels 30 January 2008

CCS ‘legitimacy’

- Sustainable renewables are presently <5%, & CO2 emissions rose globally by ca. 3% p.a. in last years
- Still, if only 1/3 of BAU coal will be build til 2030 (600 GW), without CCS those will emit approx. 4 Gt CO2/y alone – almost 1/10 of all current GHG emissions
- Priority for RES and Efficiency
- Strong Caps in EU ETS and overall EU
- WWF support for CCS conditional on reducing nuclear power, strong support for renewables & DSM
- Do not mandate CCS, mandate emissions ceilings for all new and existing power stations – part of the solution

Getting CCS on the ground by 2020 or later is NO option!

- 2006, global coal emitted about 11 Gt CO2; growing by 2.7 Gt since 1990 (33%), the largest single contributor to climate change (23%),
- Delay of 7 years for demonstration may mean a cumulative global CCS delay and resulting in +90 Gt CO2 by 2050 – or about 20 x all present EU CO2 emissions

Average coal power efficiency

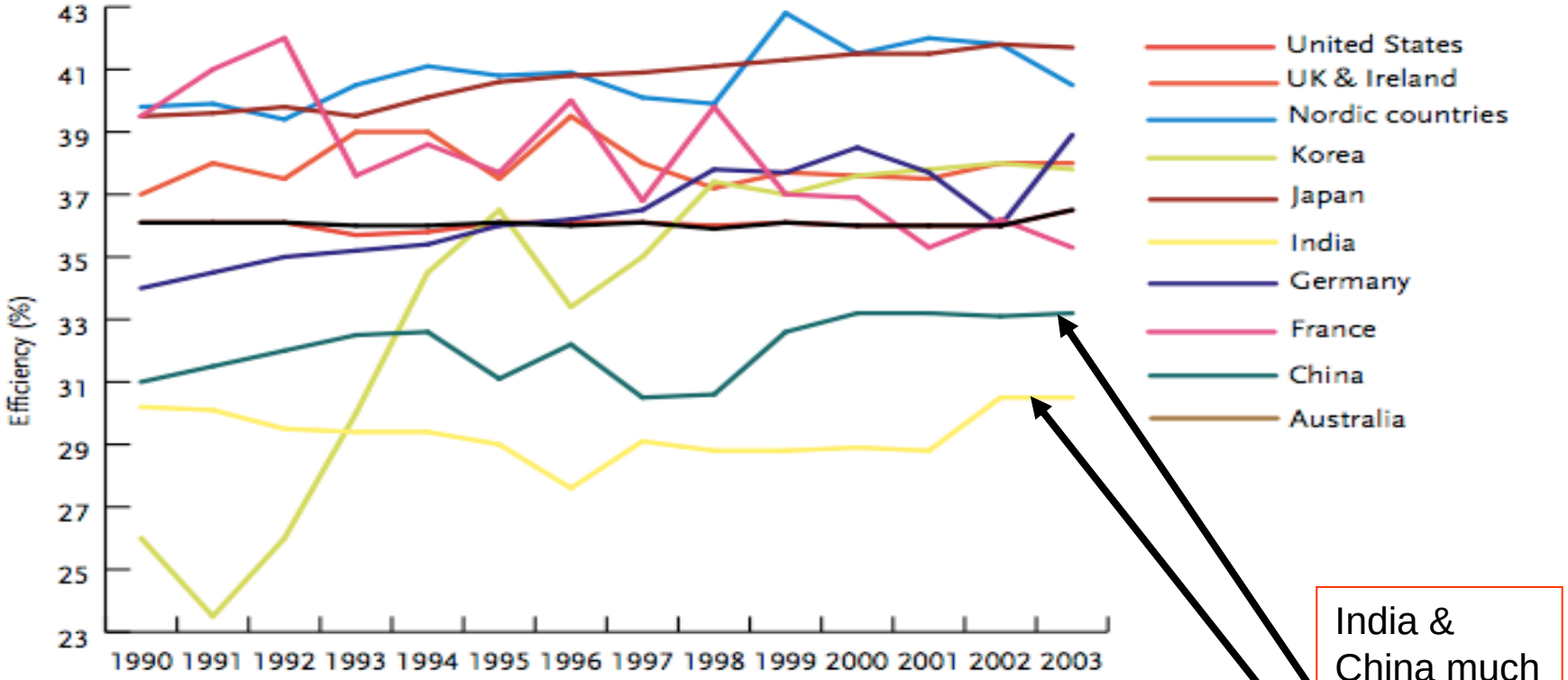
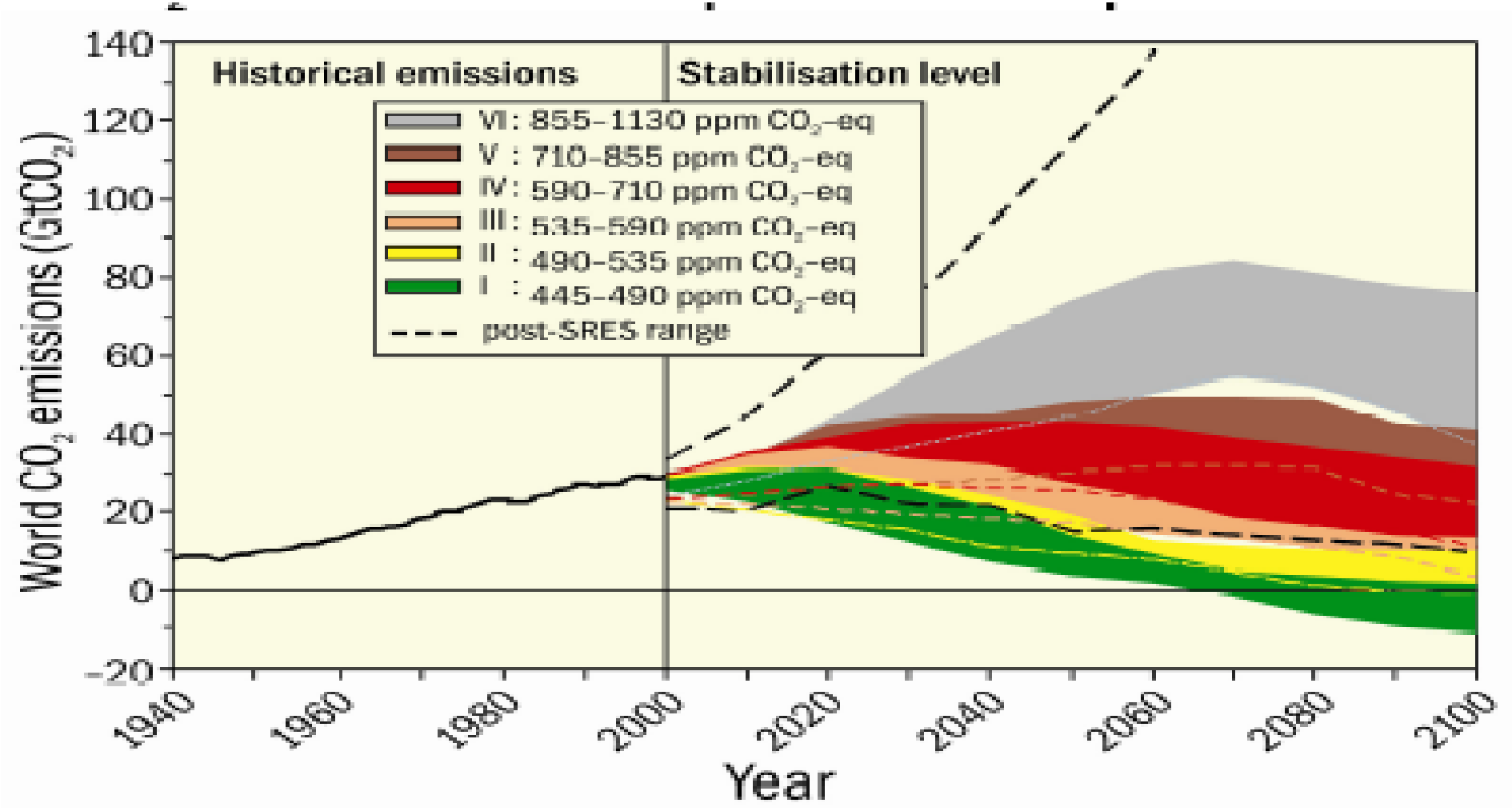


Figure 3.1 Efficiency of coal-fired power production

Source: Graus and Worrell, 2006.

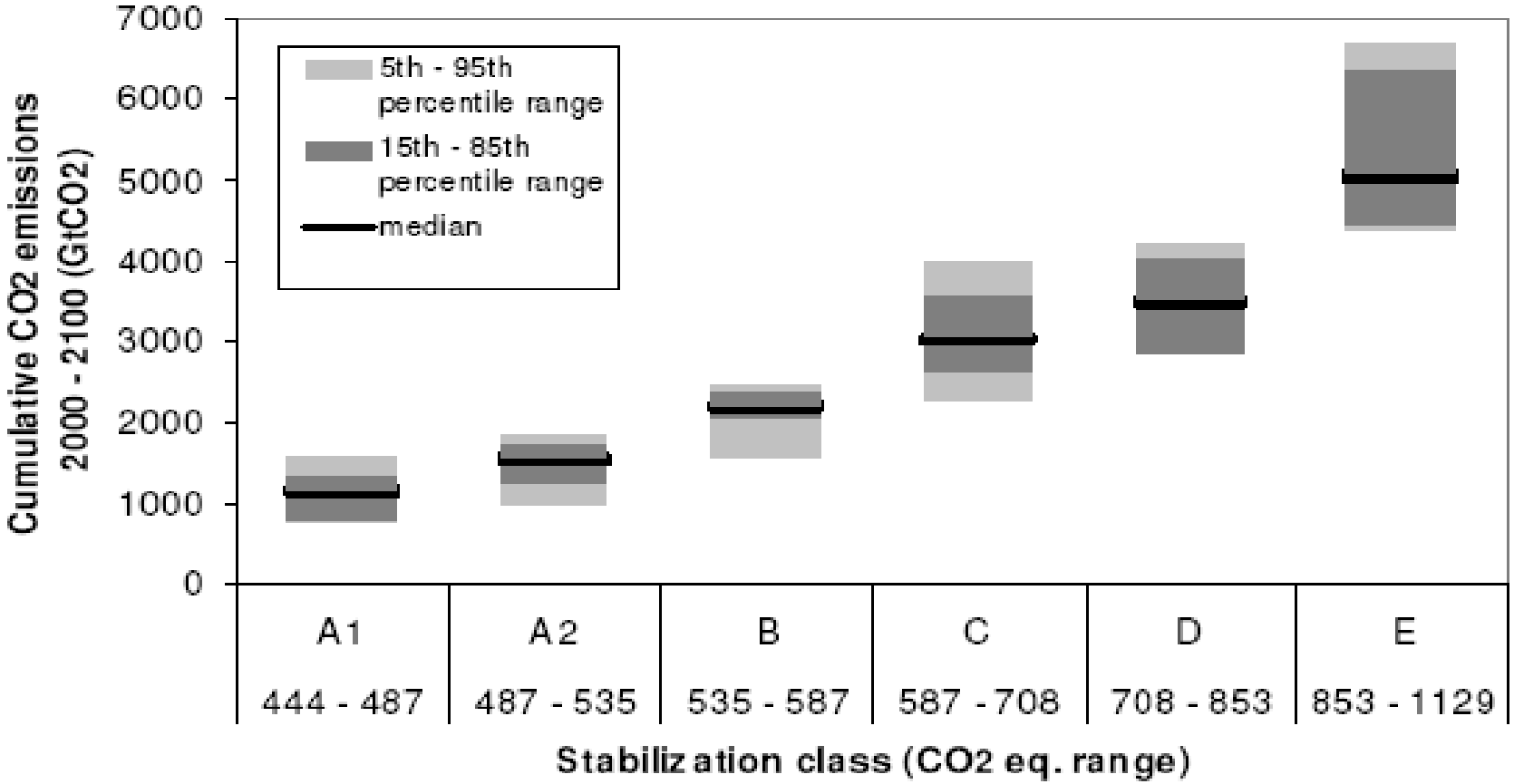
India & China much below 45% efficiency

Low atmospheric concentration requires net zero emissions world by 2070



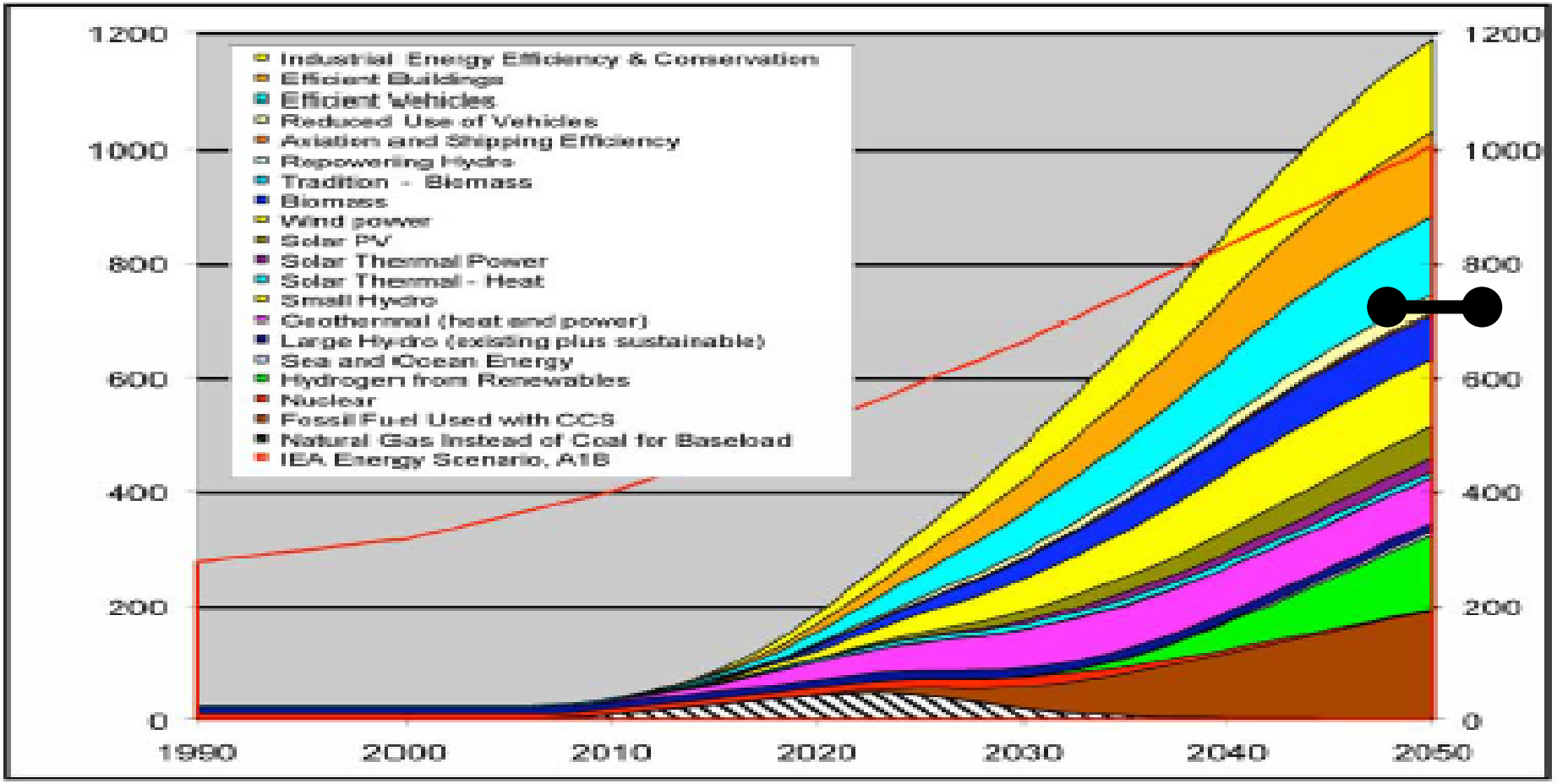
IPCC, 2007

Cumulative CO2 emissions of scenarios

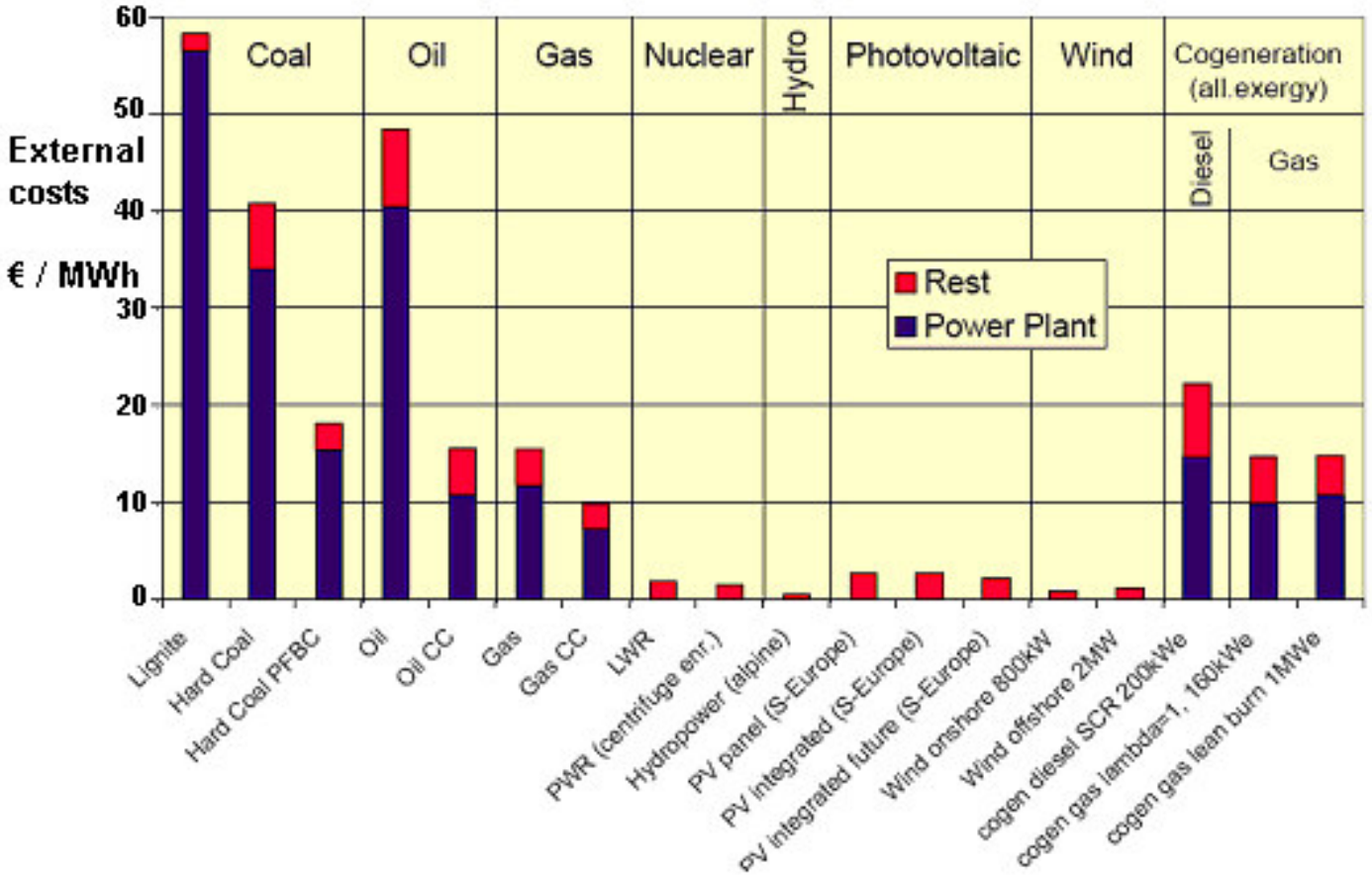


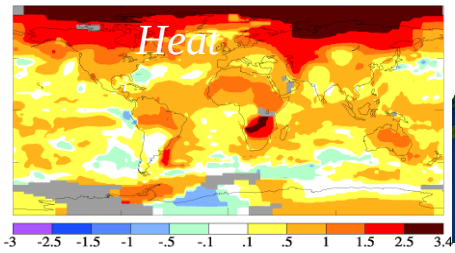
Source: IPCC, 2007

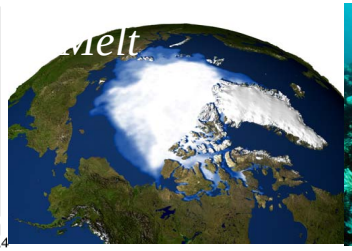
Our climate solution wedges til 2050

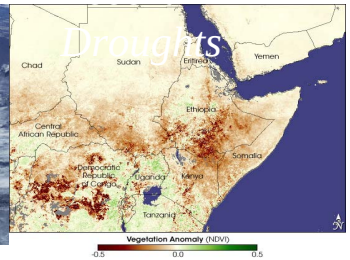


External costs of coal in EU are same as electricity price for industry

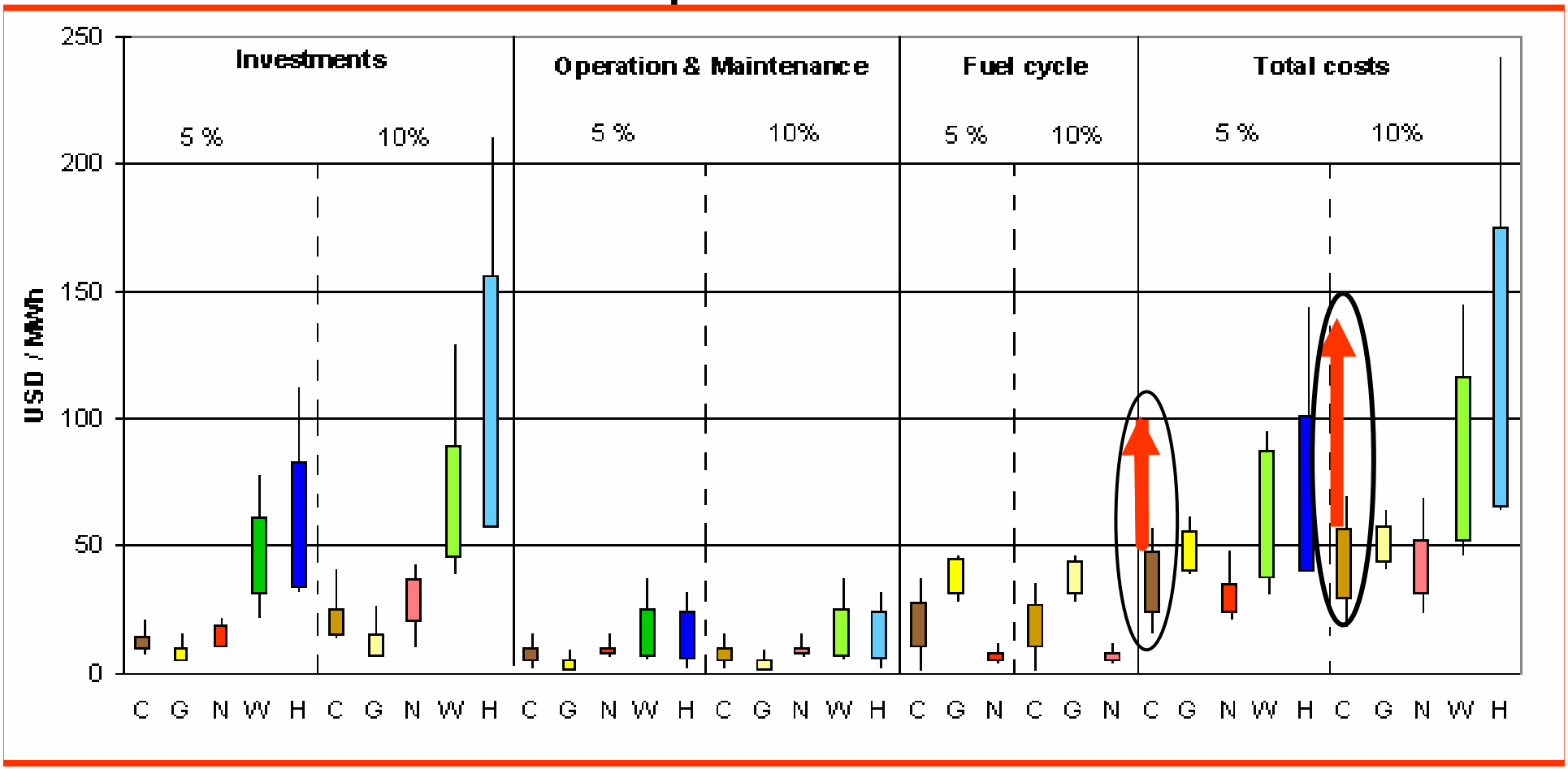






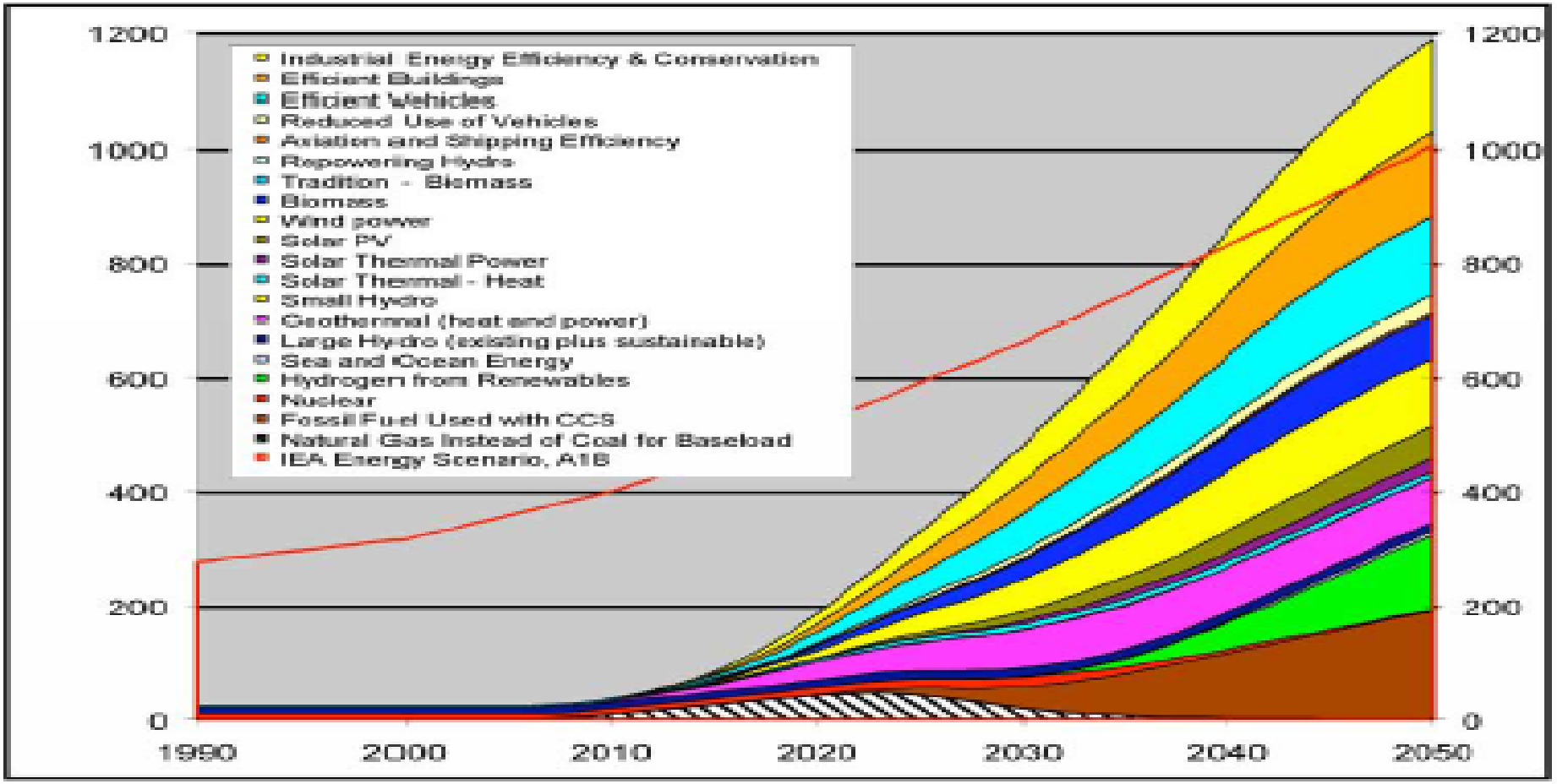


If external costs were included, coal power is more expensive than wind



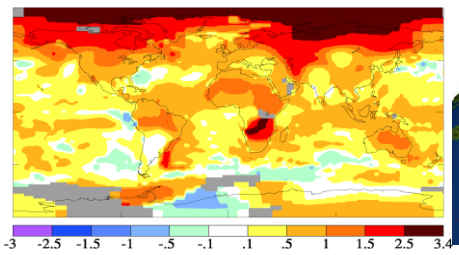
Source: Externe, 2005, IPCC, 2007 – C coal, G gas, N nuclear, W wind, H hydro

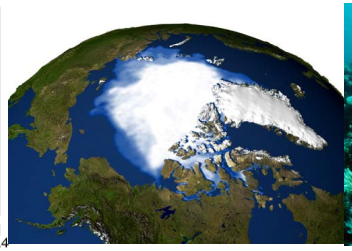
WWF climate solution wedges til 2050

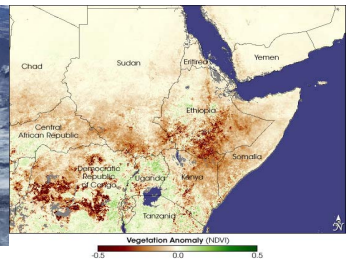


Rules of thumb to stay below 2 degree and role for CCS

- Emissions must peak soon!
- -85% to -50% CO2 cut by 2050 below 2000 levels
- Key renewables are biomass & wind, probably CSP
- Natural gas and CHP
- CCS for fossil fuels & biomass





EU coal and power

- CO2 emissions about 1600 Mt (all power),
- CO2 emissions about 1200 Mt (all coal)
- Electricity: 1000 TWh (coal), 650 TWh (gas)
- Specific CO2 - 810 g/kWh (coal)

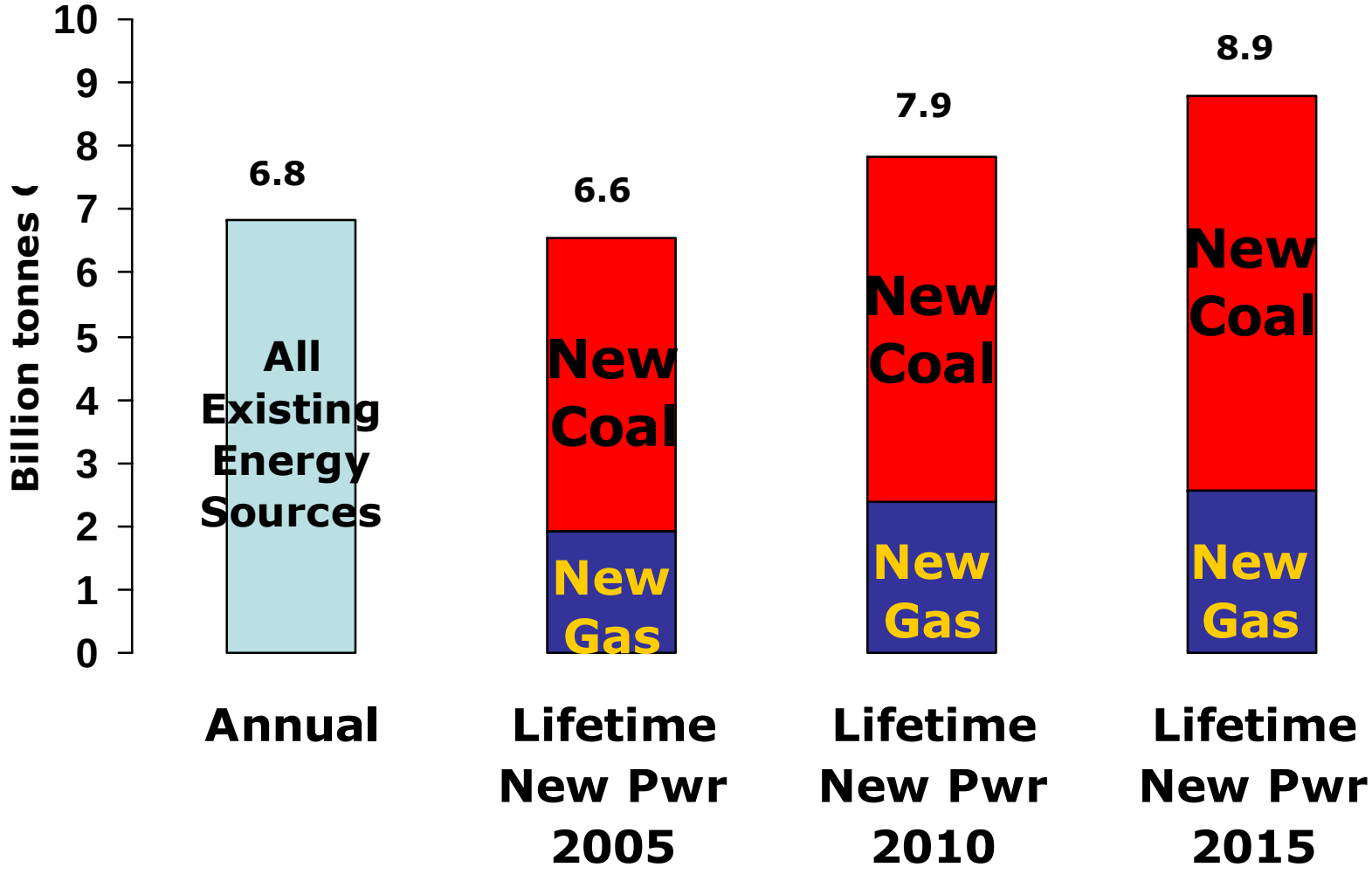
- *CO2 ceilings of 350 g CO2 (CCGT/CHP) for all new build and existing coal by 2020 will result in reduction of 685 Mt CO2 by 2020 (or 12% of all EU27 GHG emissions)*

Time plan for EU

- Regulatory frame work 2008 incl. proposals for site assessments, monitoring, liability, *& emissions standards for new and existing power stations*
- Early site assessments, geological suitability - most of EU's scheduled and supported CCS pilots shall focus on storage
- Parts of the CCS pilots should be in coal-rich developing nations
- *If* site assessment is positive and independently monitored (2012) strong emissions standards developed for all new (2015) and all existing (2020) power stations in EU
- Keep in mind: 70 GW coal in pipeline (10-15 years)

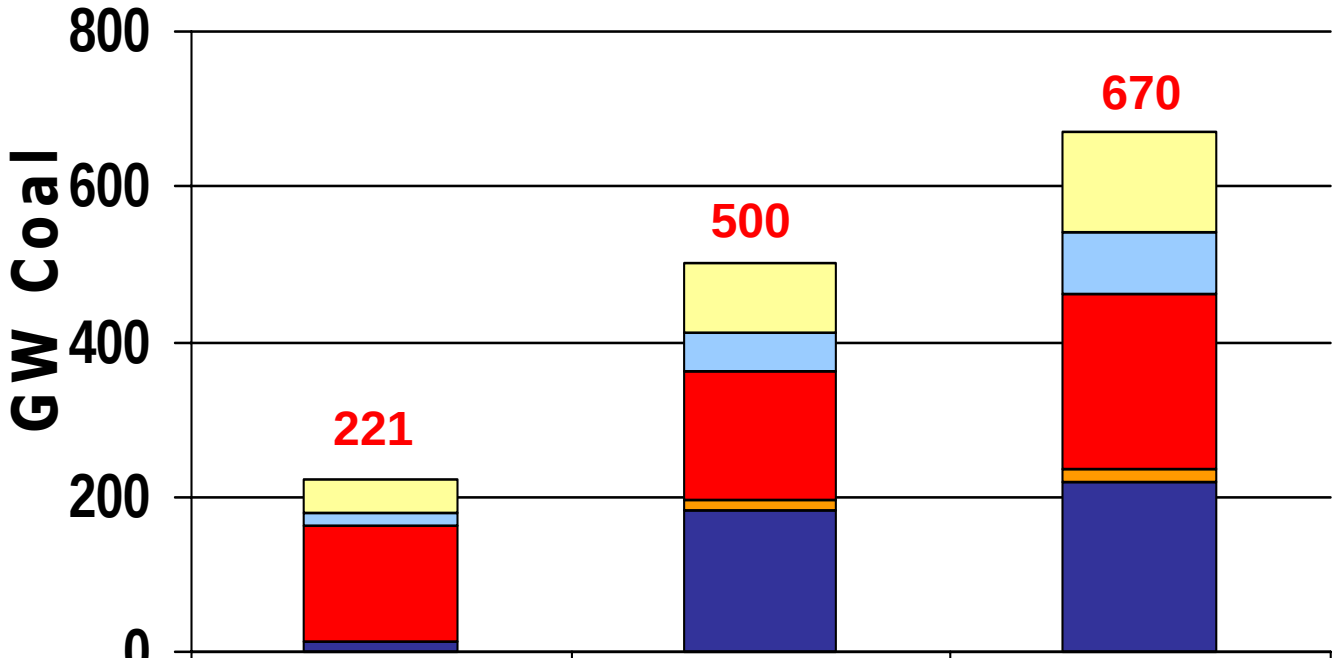
Annual Carbon Commitment

Lifetime Emissions of Annual New Fossil Investment



Source: new fossil capacity, IEA, WEO 2004

New Coal Build by Decade



	2003-2010	2011-2020	2021-2030
Other Developing	43	90	128
India	16	48	79
China	150	168	226
Transition	1	11	19
OECD	12	184	218

Incremental new coal capacity by decade

Source: IEA, WEO 2004

EU needs

Carbon-free power sector by 2035!

Need Moratorium on all conventional new built non-capture/non- storage ready power stations

Wake up - its time for fighting climate change!