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CCS - an uncomfortable but necessary option

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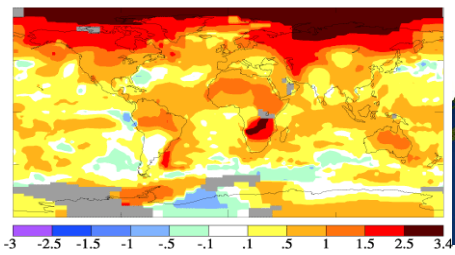
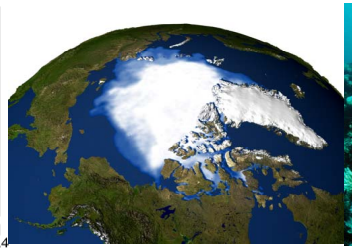
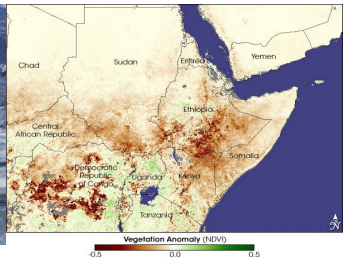
Rules of thumb to stay below 2 degree

- Global carbon budget max 400/500 Gt C til 2200 - translates into c 2 Gt C/a (8 Gt C/a now)
- Emissions must peak soon!
- -85% to -50% CO2 cut by 2050 below 2000 levels
- PE consumption increase <50% by 2050
- Key role for energy conservation
- Reduce and stop deforestation
- Key renewables are biomass & wind, probably CSP
- Natural gas and CHP
- CCS for fossil fuels & biomass





CCS ‘legitimacy’

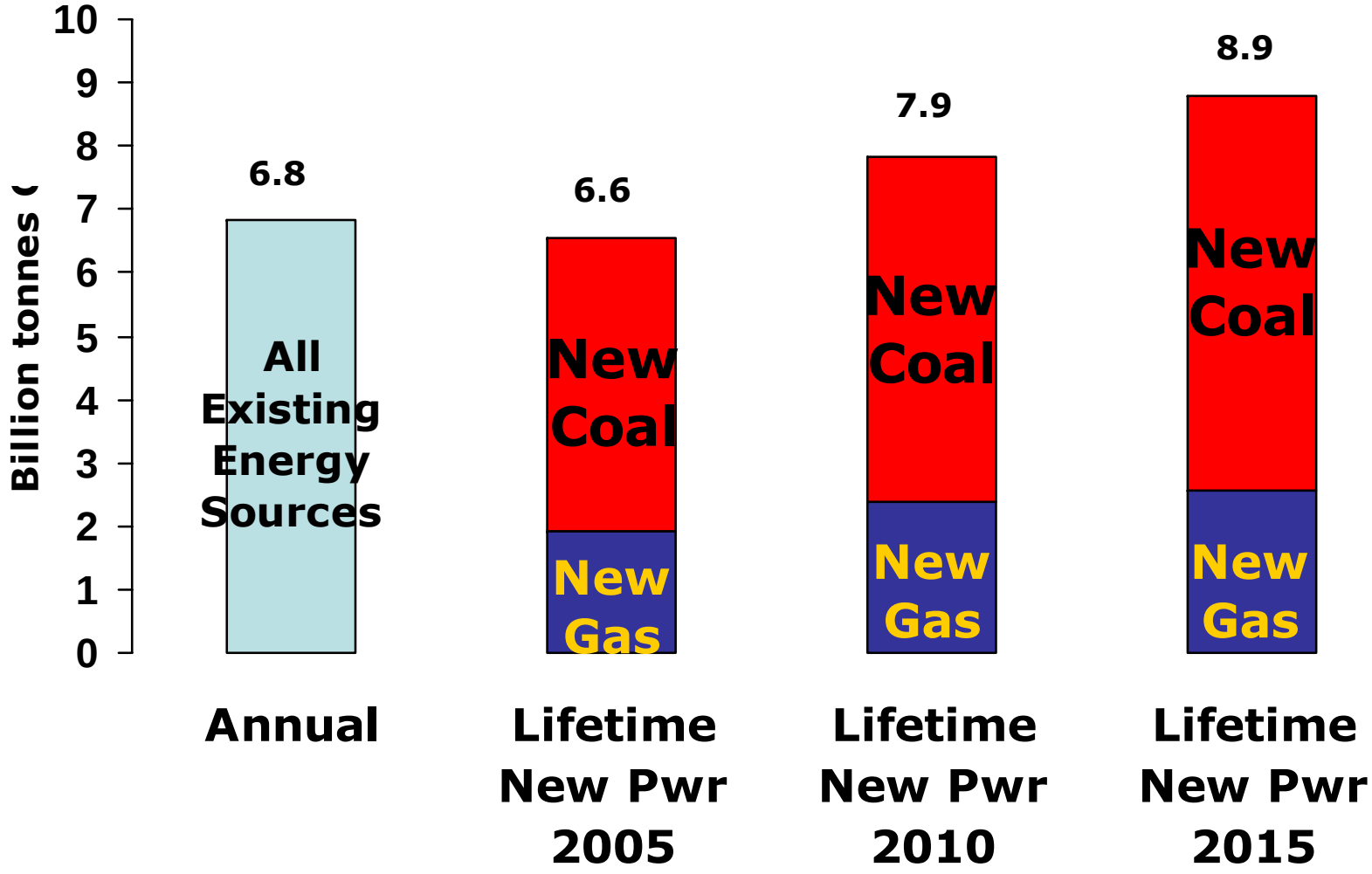
- Priority for RES and Efficiency
- Strong Caps in EU ETS and overall EU
- WWF support for CCS conditional on reducing nuclear power, strong support for renewables & DSM

Time plan for EU

- Regulatory frame work 2007 incl. proposals for site assessments, monitoring, liability, & emissions standards for new power stations
- Early site assessments, geological suitability - most of EU's scheduled at least 12 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 new (2015) and all (2020) power stations in EU
- Keep in mind: a) about 70% of all coal replaced by 2025, b) tell message: new built *now* must be capture-ready

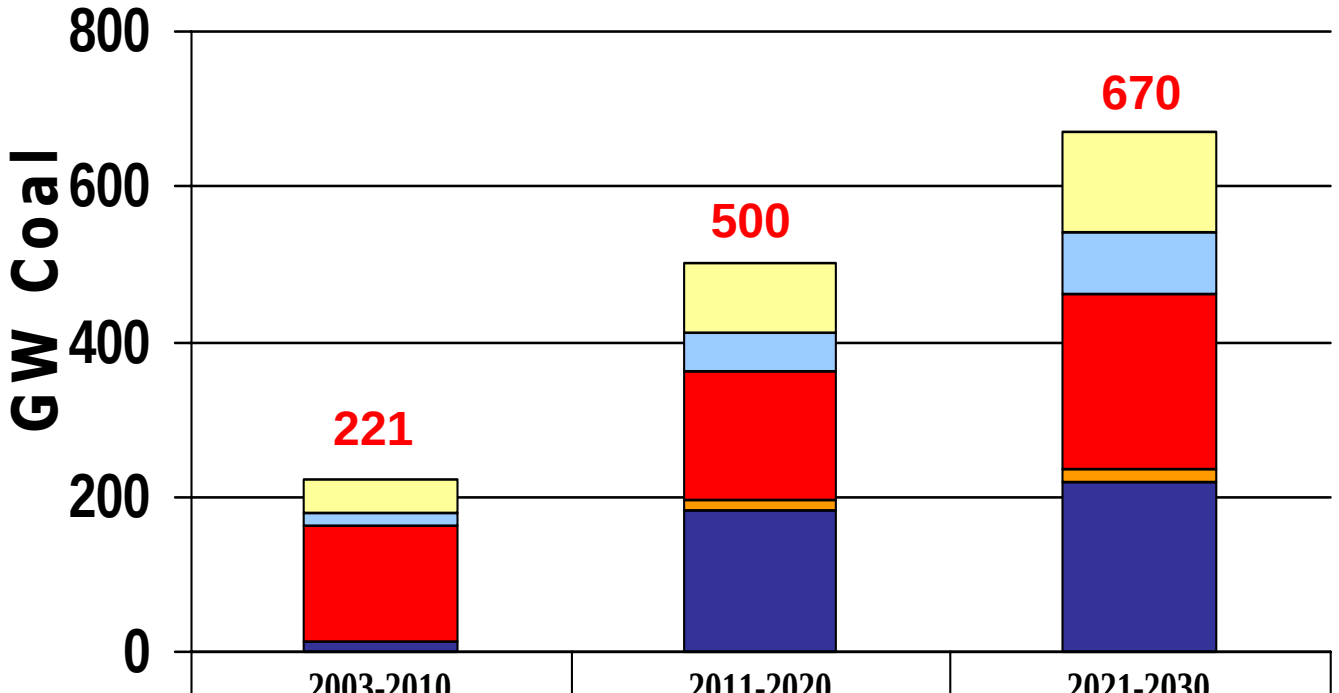
Annual Carbon Commitment

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

Without CCS

- **Still, if only 1/3 of coal will be build til 2030 (500 GW), without CCS it will emit approx. 1 Gt C/y alone - 1/10 of all current GHG emissions**
- **Increase of global energy demand probably impossible to meet while staying below 2 degree**
- **Sustainable renewables are presently <5%, & CO2 emissions rose globally by ca. 3% p.a. in last years**

EU trends

- 187 GW coal emit about 960 Mt CO2
- 100 GW replaced til 2020
- >410 GW new fossil power capacity in BAU by 2020
- 880 GW new capacity in BAU by 2030 (IEA, 2007) -
- 200 new GW capacity in a -30% GHG emissions reduction scenario (WI, 2005) by 2020

EU needs

Carbon-free power sector by 2035!

Need Moratorium on all conventional new built power stations:

- Priority for EIA, DSM assessment
- Priority for CHP/cooling
- No permit from [2015] for new built with emissions >CHP CCGT
- Same standards for all existing by [2020]

Wake up - its time for fighting climate change!