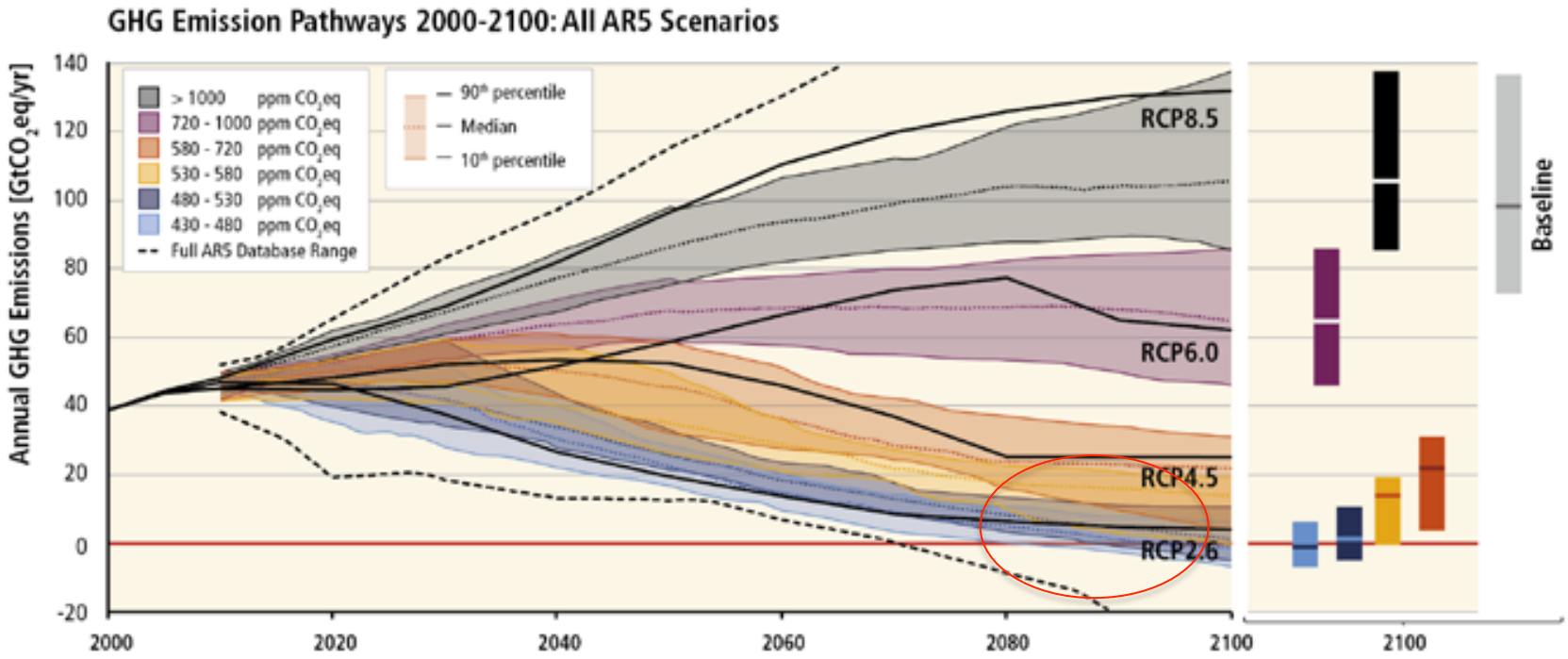
IPCC findings on energy and developments since

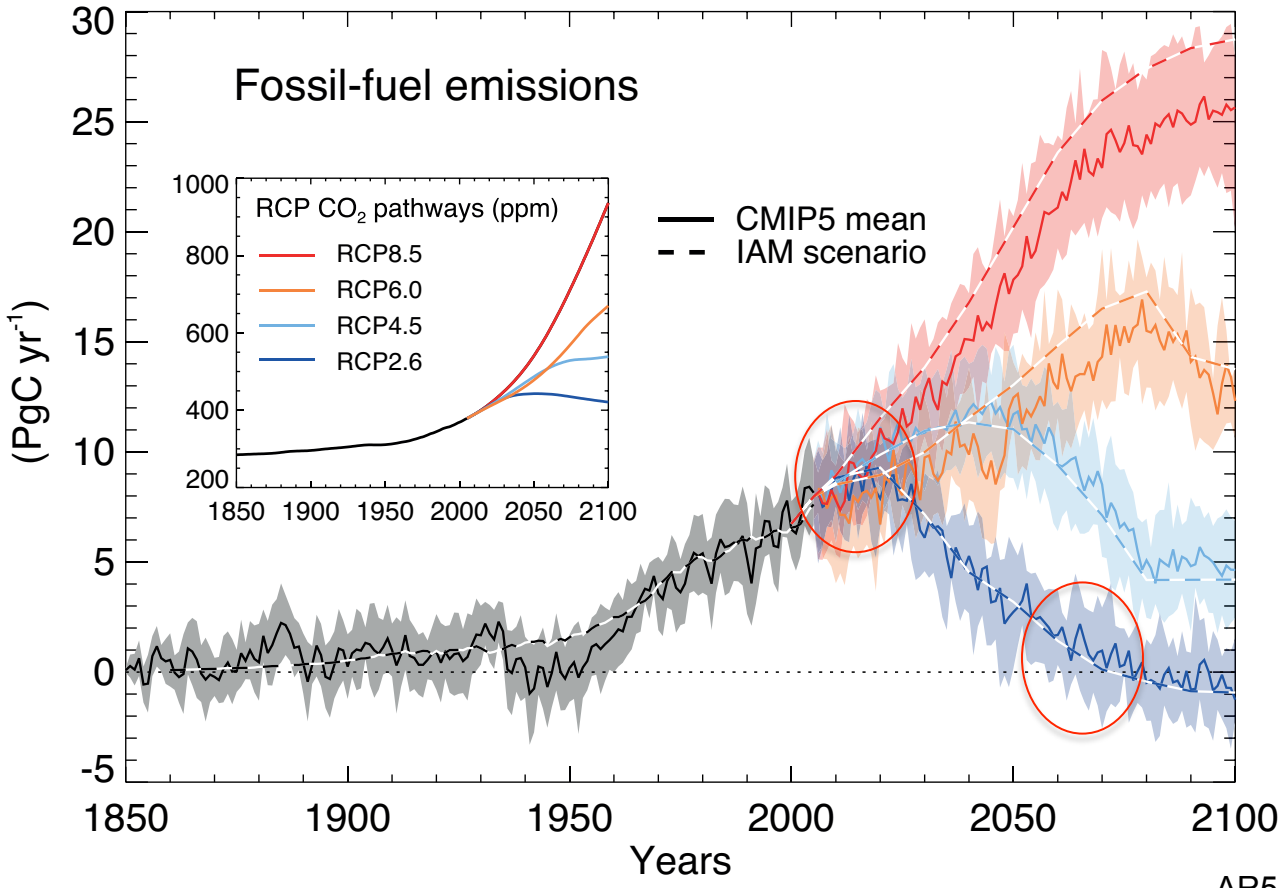
Below 2°C = zero emissions

All GHG emissions



AR5. WGIII Figure SPM.4

Fossil fuel emissions



AR5. WG1. Figure TS.19

Electricity emissions

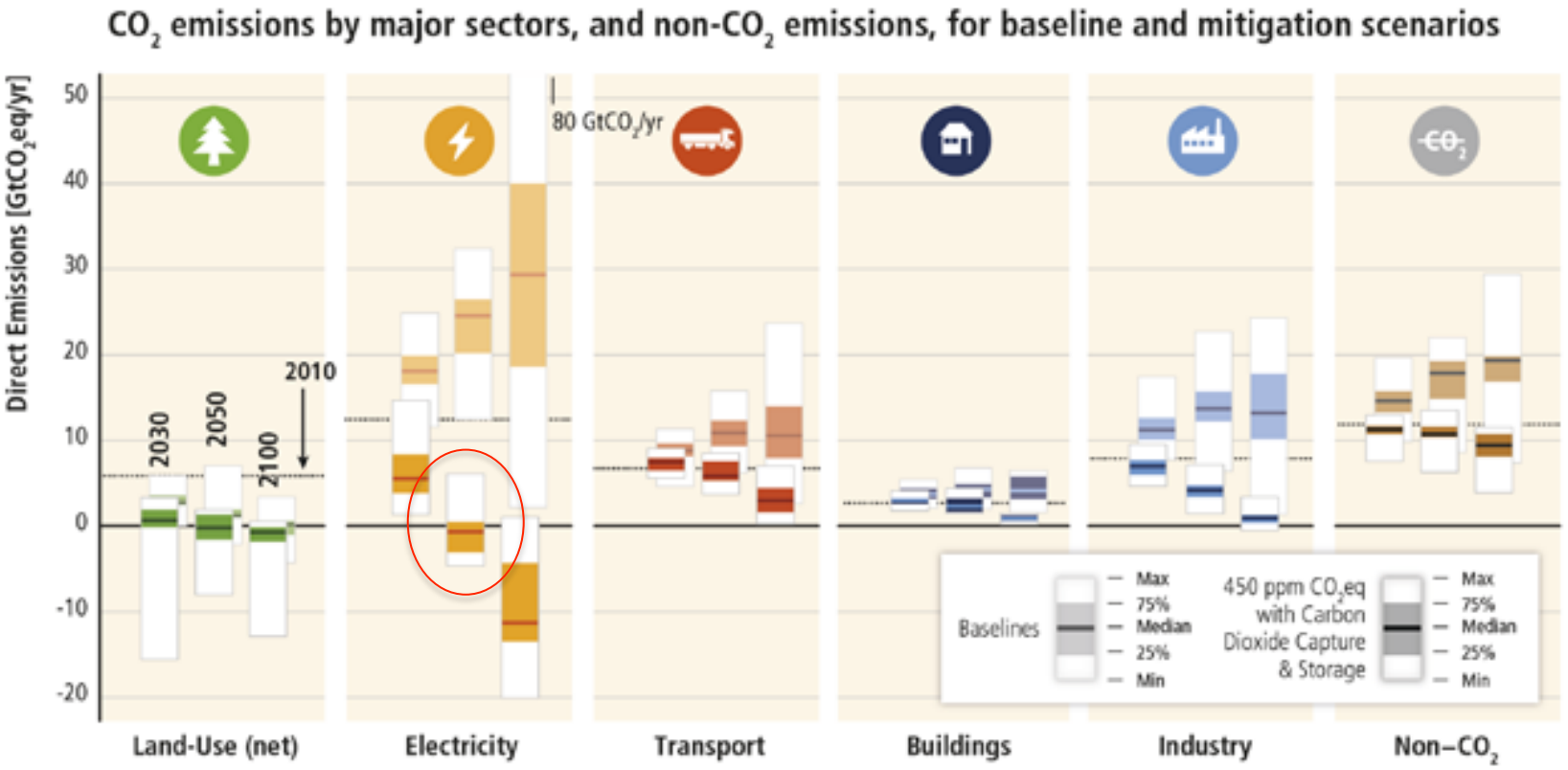


Figure SPM.14: CO_2 emissions by sector and total non-CO_2 GHGs (Kyoto gases) across sectors in baseline

How to peak & head for zero?

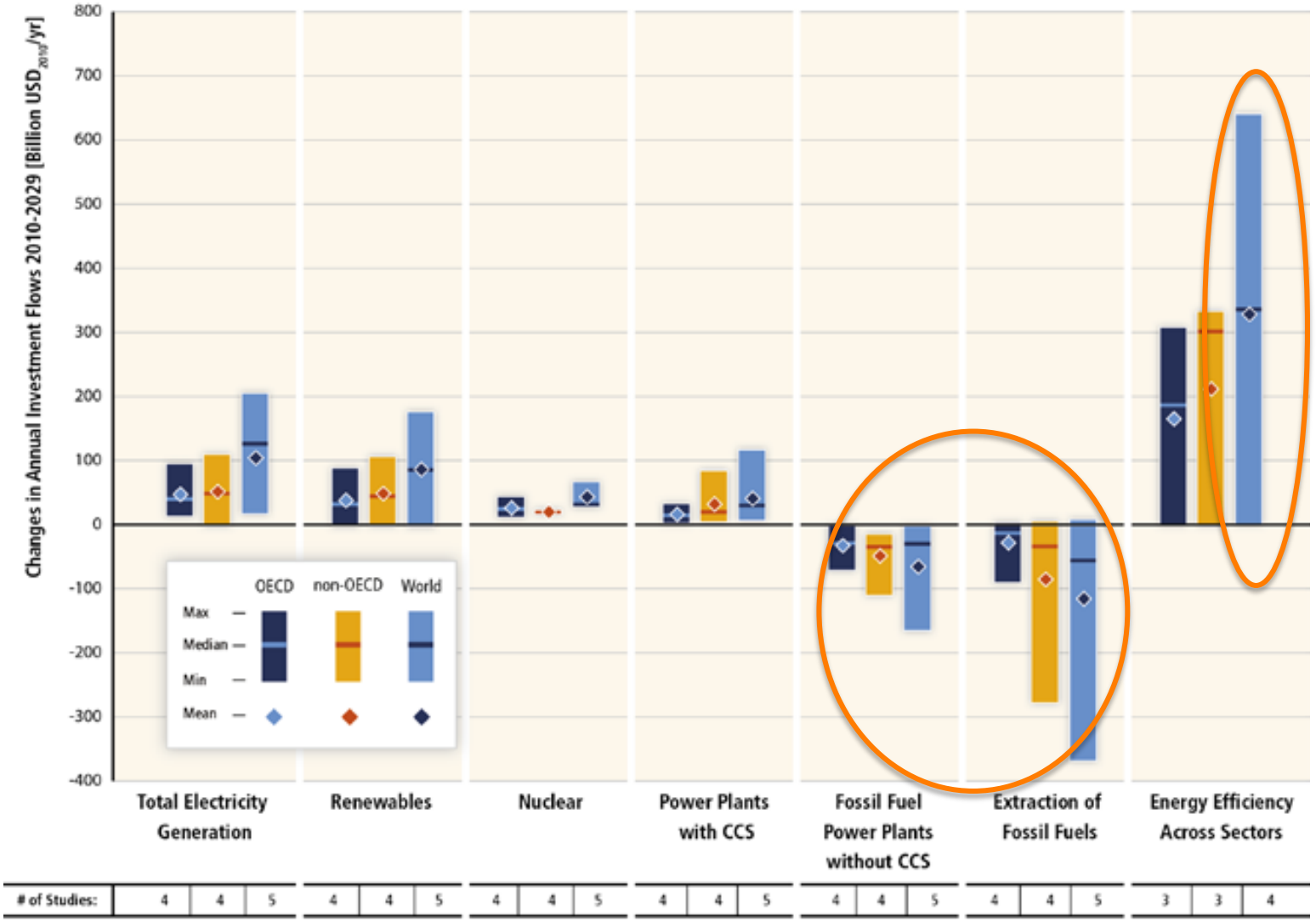


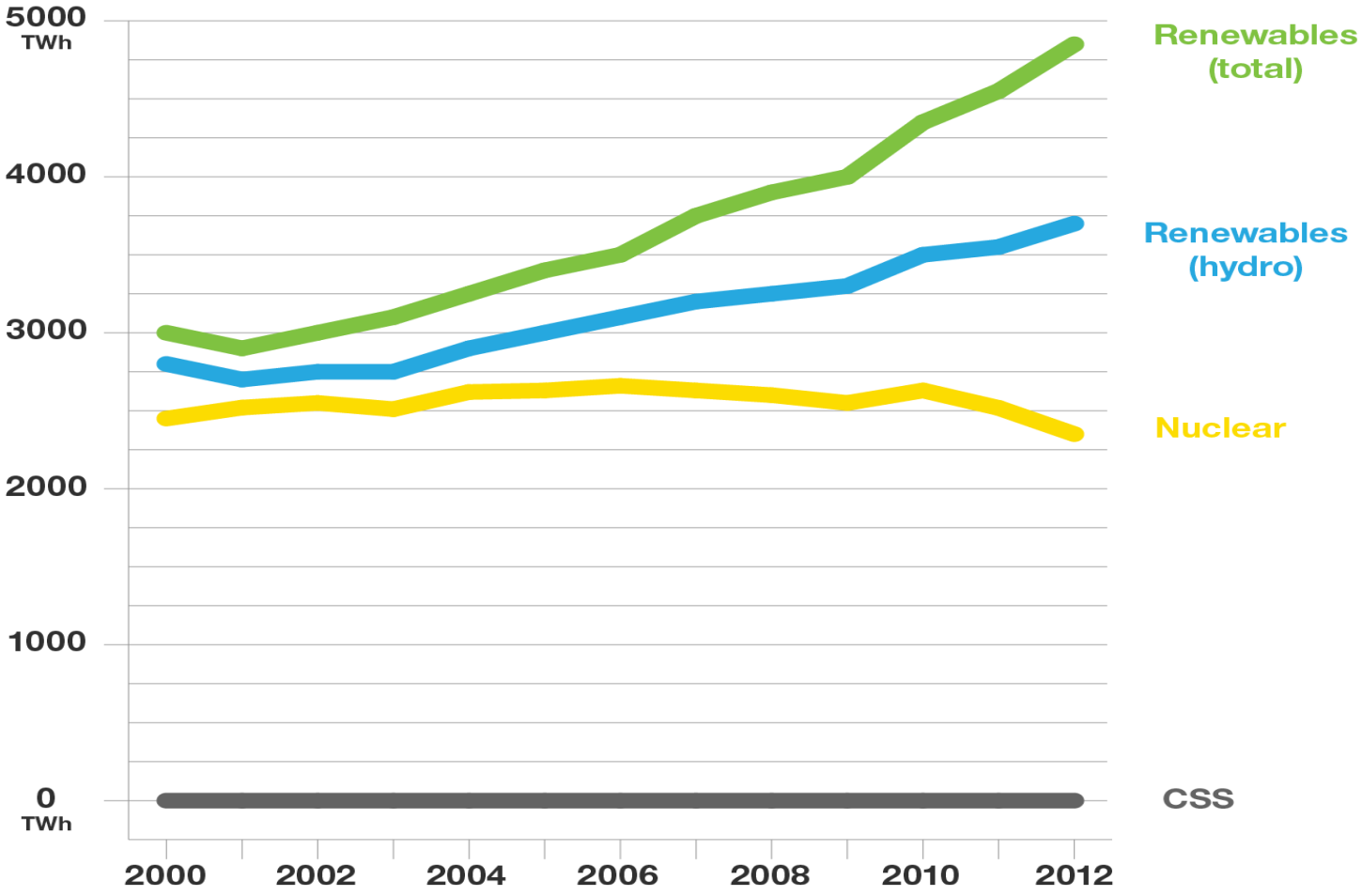
Figure 4.4: Change in annual investment flows from the average baseline level over the next two decades (2010 to 2029) for mitigation scenarios that stabilize concentrations within the range of approximately 430-530 ppm CO_2eq by 2100. Total electricity generation (leftmost column) is the sum of renewable and nuclear energy, power plants with CCS, and fossil-fuel power plants without CCS. The vertical bars indicate the range between the minimum and maximum estimate; the horizontal bar indicates the median. The numbers in the bottom row show the total number of studies in the literature used in the assessment. Individual technologies shown are found to be used in different model scenarios in either a complementary or a synergistic way, depending largely on technology-specific assumptions and the timing and ambition level of the phase-in of global climate policies. *{WGIII Figure SPM 9}*

In energy supply, tripling to quadrupling of:

- Renewable energy
- Nuclear
- Carbon Capture and Storage (CCS)
- Biomass + Carbon Capture and Storage

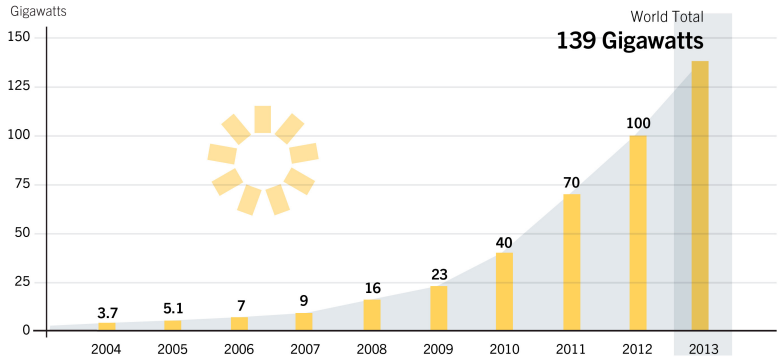
Global power production from renewables, nuclear and power plants with carbon capture and storage

Sources: IEA: Tracking Clean Energy Progress 2014 and World Nuclear Industry Status Report 2014.



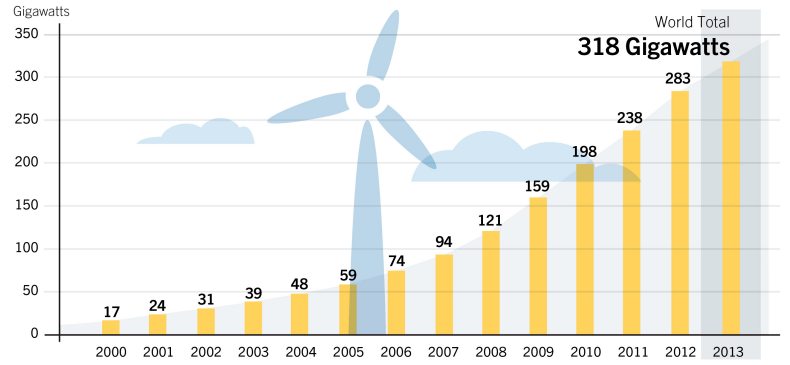
"In just a few years, renewable energy technologies have demonstrated **substantial performance improvements and cost reductions**, and a growing number of technologies have achieved a **level of maturity to enable deployment at a significant scale**." (IPCC AR5, WGIII)

Solar PV Total Global Capacity, 2004–2013



REN21. 2014. *Renewables 2014 Global Status Report* (Paris: REN21 Secretariat).

Wind Power Total World Capacity, 2000–2013



REN21. 2014. *Renewables 2014 Global Status Report* (Paris: REN21 Secretariat).

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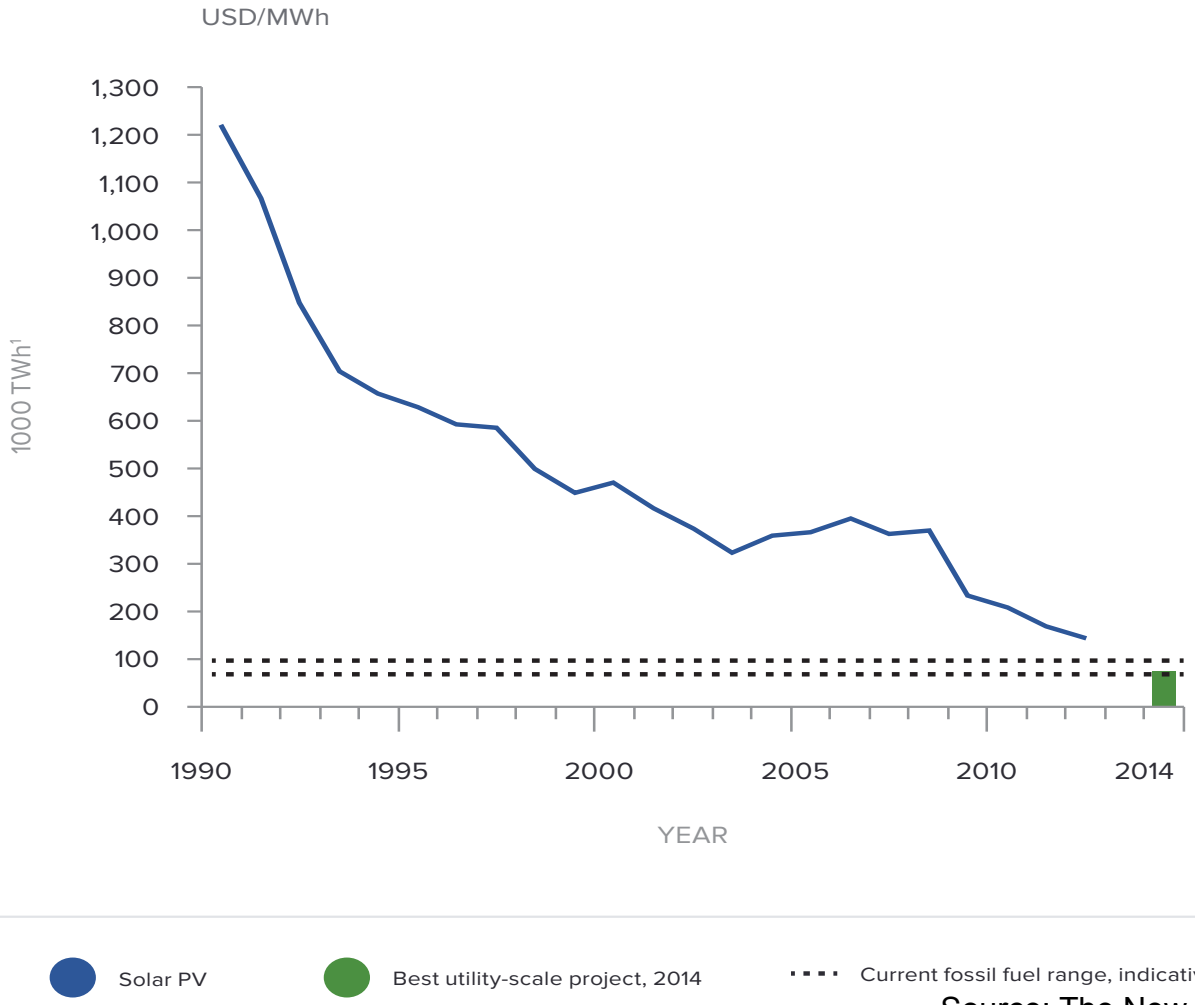
Costs of solar declining so fast that the AR5 costs for solar are already out-of-date

Figure 4

Indicative levelised costs of solar PV electricity over time, and estimated lowest utility-scale cost to date, compared to a global reference level for coal and natural gas



Source: The New Climate Economy Report

"I'm not sure I could stand before you if the threats of climate change had no solutions. But they do."

"Renewable energy is a real option. Half of the world's new electricity generating capacity in 2012 came from renewables. We also have tremendous opportunities to improve energy efficiency. And we can further reduce emissions by stopping deforestation."

- Rajendra Pachauri
Chairman of the Intergovernmental Panel on Climate Change,
speaking at the New York Climate Summit 2014

Photo: IPCC

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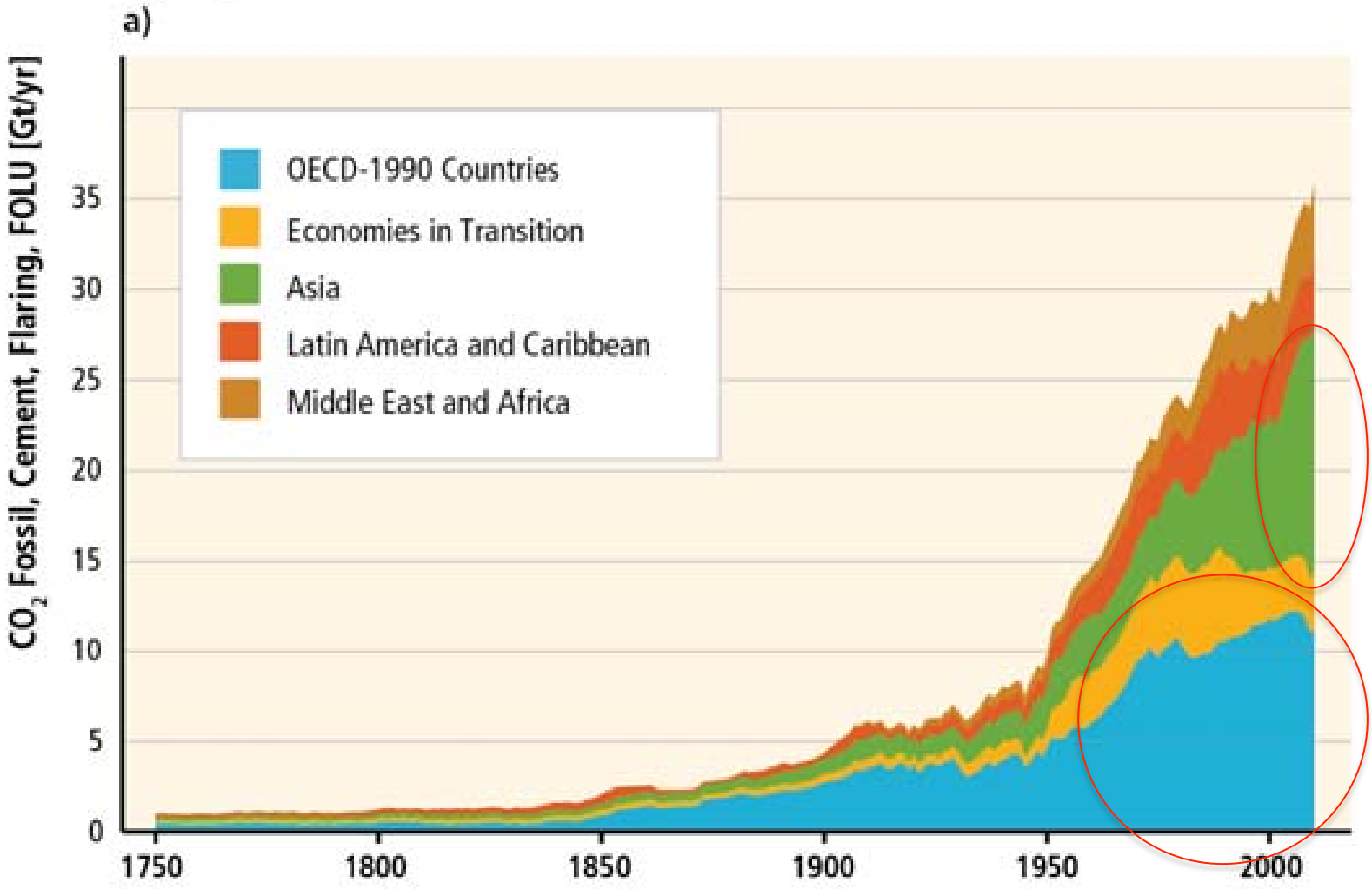
How do we get rid of fossil fuels?


a)
CO_2 Fossil, Cement, Flaring, FOLU [Gt/yr]
OECD-1990 Countries
Economies in Transition
Asia
Latin America and Caribbean
Middle East and Africa
0
5
10
15
20
25
30
35
1750
1800
1850
1900
1950
2000

A decade of coal

- Coal's total consumption rose 50% between 2000 and 2010.
- Has reversed a long-standing pattern of decarbonization.
- Coal accounts for 73% of power sector emissions. (New Climate Economy)
- More than half of global carbon emissions' growth in 2002-2012 was caused by China's coal alone. (Global CO2 statistics)
- In 2003-2012 China's coal use grew by about 10% a year (China energy statistics)

Airpocalypse

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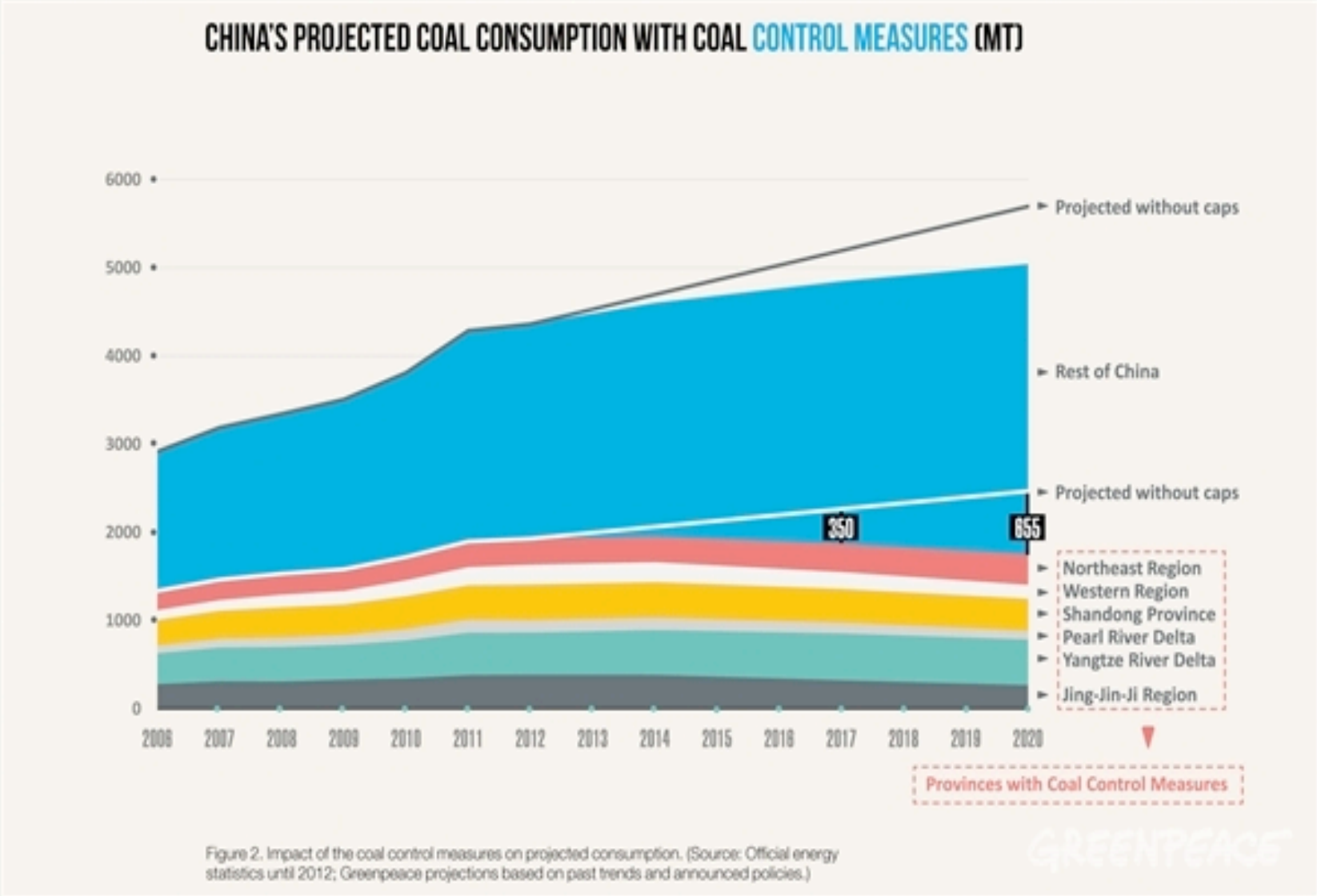


Figure 2. Impact of the coal control measures on projected consumption. (Source: Official energy statistics until 2012; Greenpeace projections based on past trends and announced policies.)

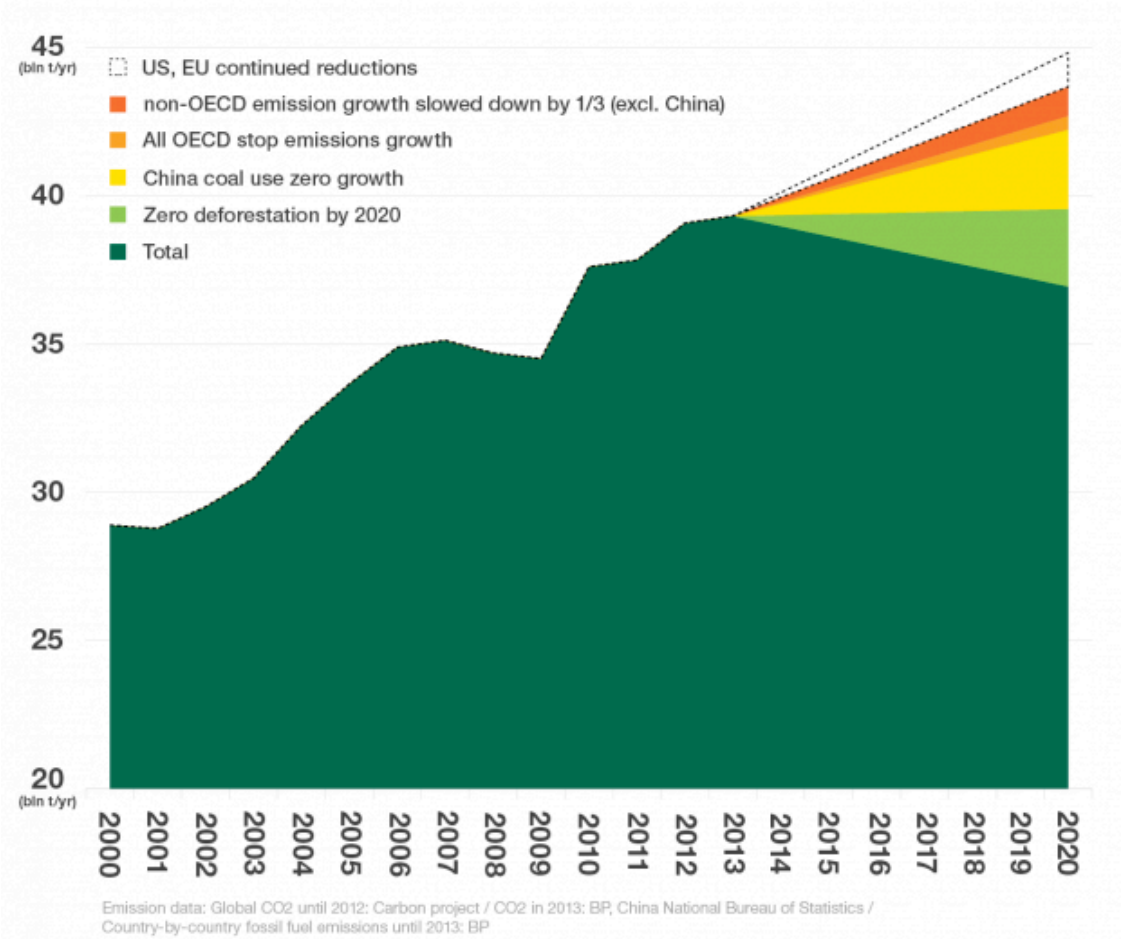
The End of China's Coal Boom (April 2014): http://www.greenpeace.org/eastasia/publications/reports/climate-energy/2014/end-china-coal-boom/

Reaching the “impossible” peak?

- Coal use in China is *falling* this year - according to official data.
- 1-2 % less coal burned in the first three-quarters of 2014 than last year.
- The Chinese economy continues to grow by 7.4%.
- China‘s next five-year plan for 2016-2020 is likely to be the single most important document for the future of the climate.
- Initial proposals from China’s National Energy Agency would
  - limit the growth in coal consumption to 2%,
  - wind power capacity would more than double
  - solar capacity would grow more than 5-fold.

The global significance?

What would it take to peak global CO_2?



See related analysis “As China and the US move away from coal could global emissions really peak?” by Lauri Myllyvirta at Energydesk: http://www.greenpeace.org.uk/newsdesk/energy/analysis/china-and-us-move-away-coal-there-new-opportunity-global-emissions-peak

Conclusions

- Emissions' phase out is a welcome, new IPCC message.
- Zero carbon future is build (or missed) with today's investment decisions, due to their long life-times & "emissions commitment".
- Denmark's example shows what it means to take fossil phase out seriously.
- There's fresh hope for climate:
  - Renewables breakthrough
  - Coal projections changing rapidly
- Some developments are too recent to be covered by the IPCC.

Will the UNFCCC & governments turn focus into phase out?

Thank you!

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