POTSDAM INSTITUTE FOR CLIMATE IMPACT RESEARCH

Realistic Entry Points for an effective Climate Policy

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COP 21
Climate Change: The Finance Sector and Pathways to 2° C
Assemblée Nationale, Paris, 30 November 2015

Leibniz Gemeinschaft

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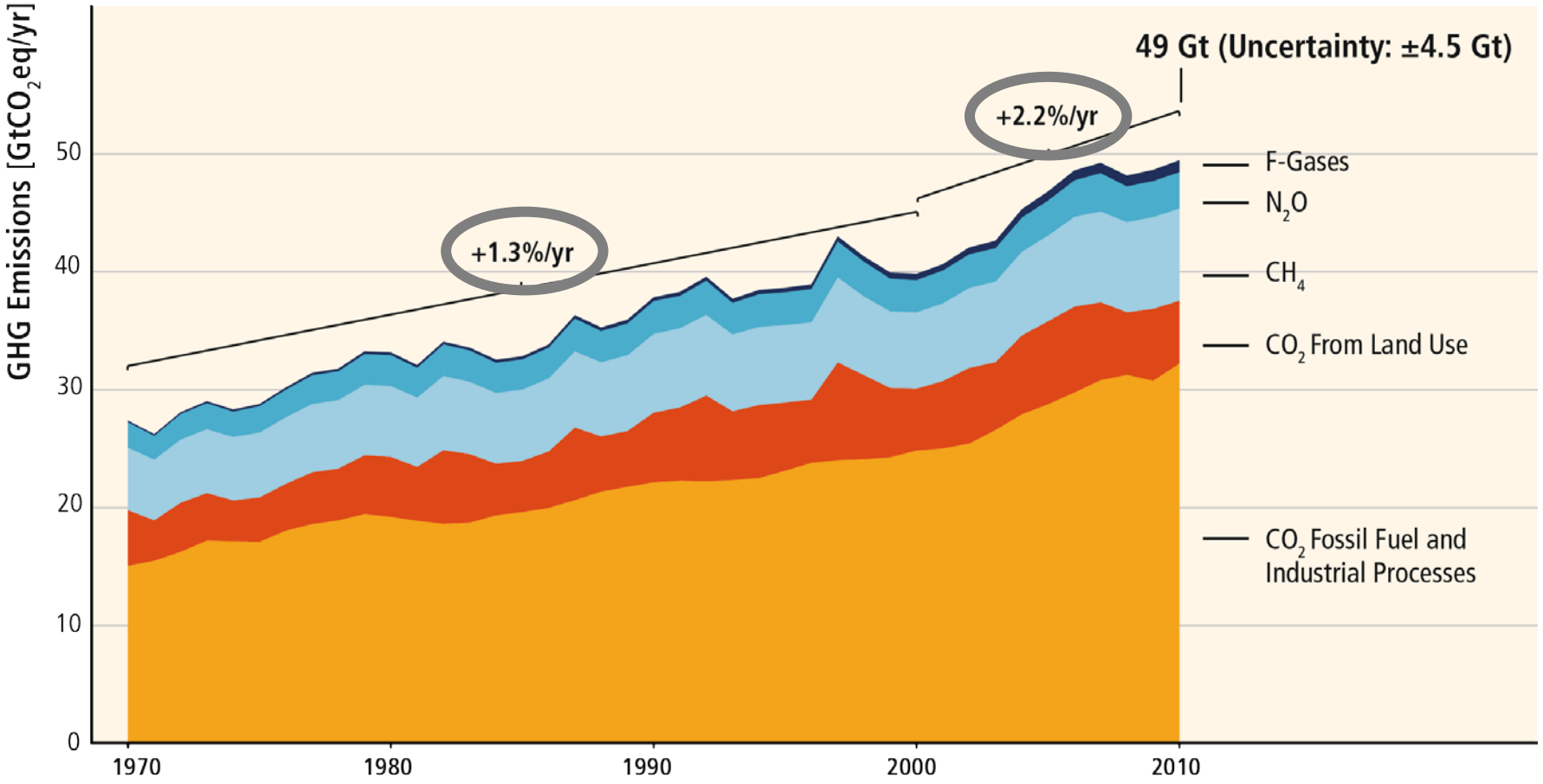
Mercator Research Institute on Global Commons and Climate Change

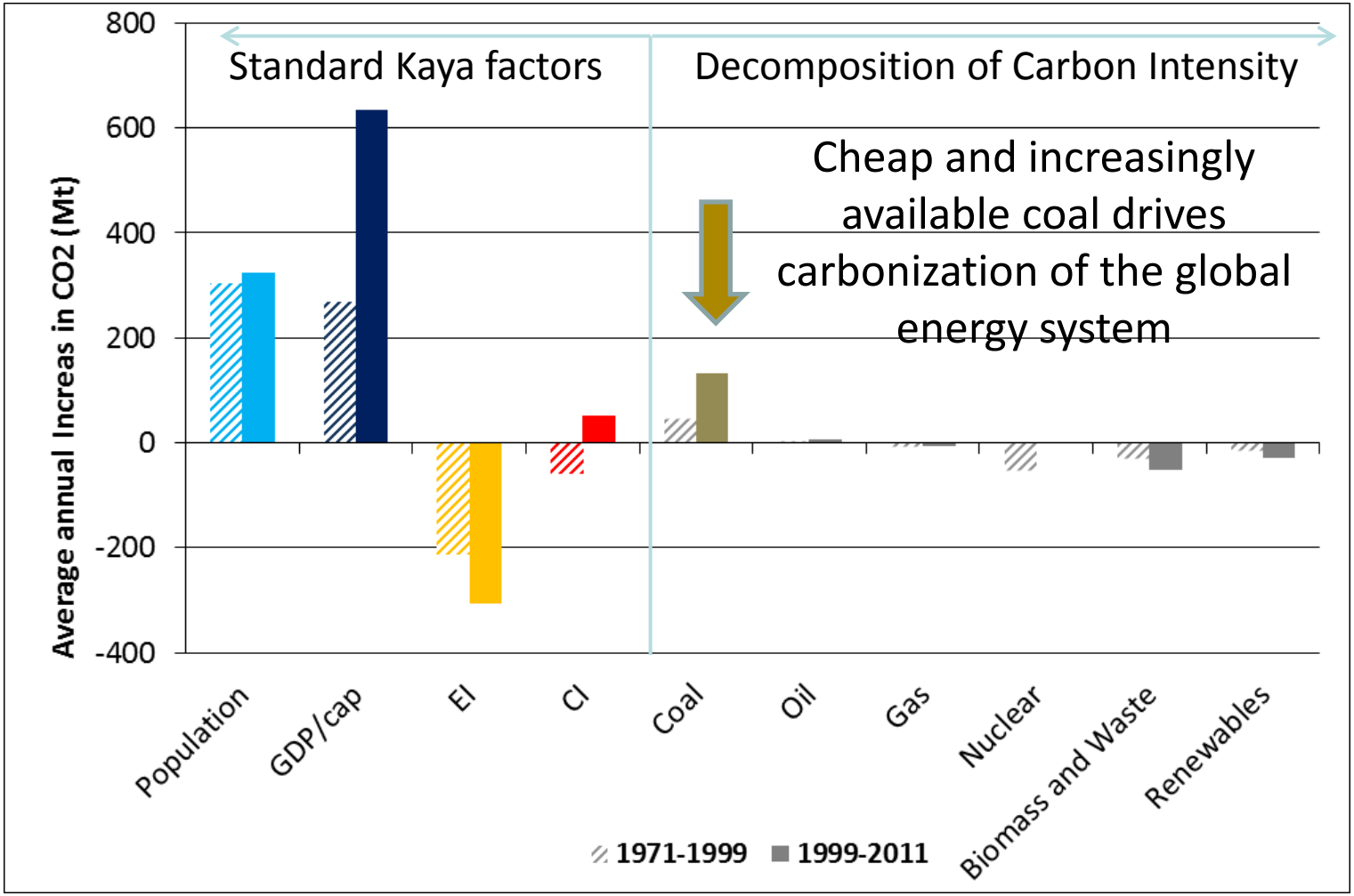
Technische Universität Berlin

GHG emissions growth between 2000 and 2010 has been larger than in the previous decades.



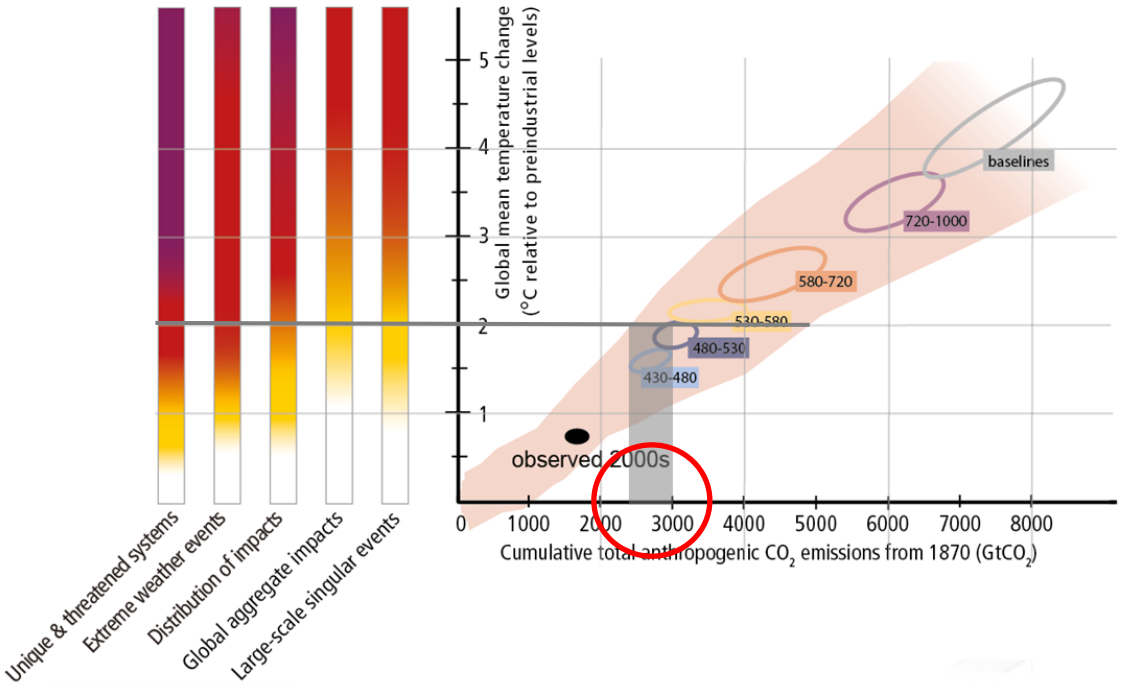
Based on Figure 1.3

A renaissance of coal drives the global carbonization.



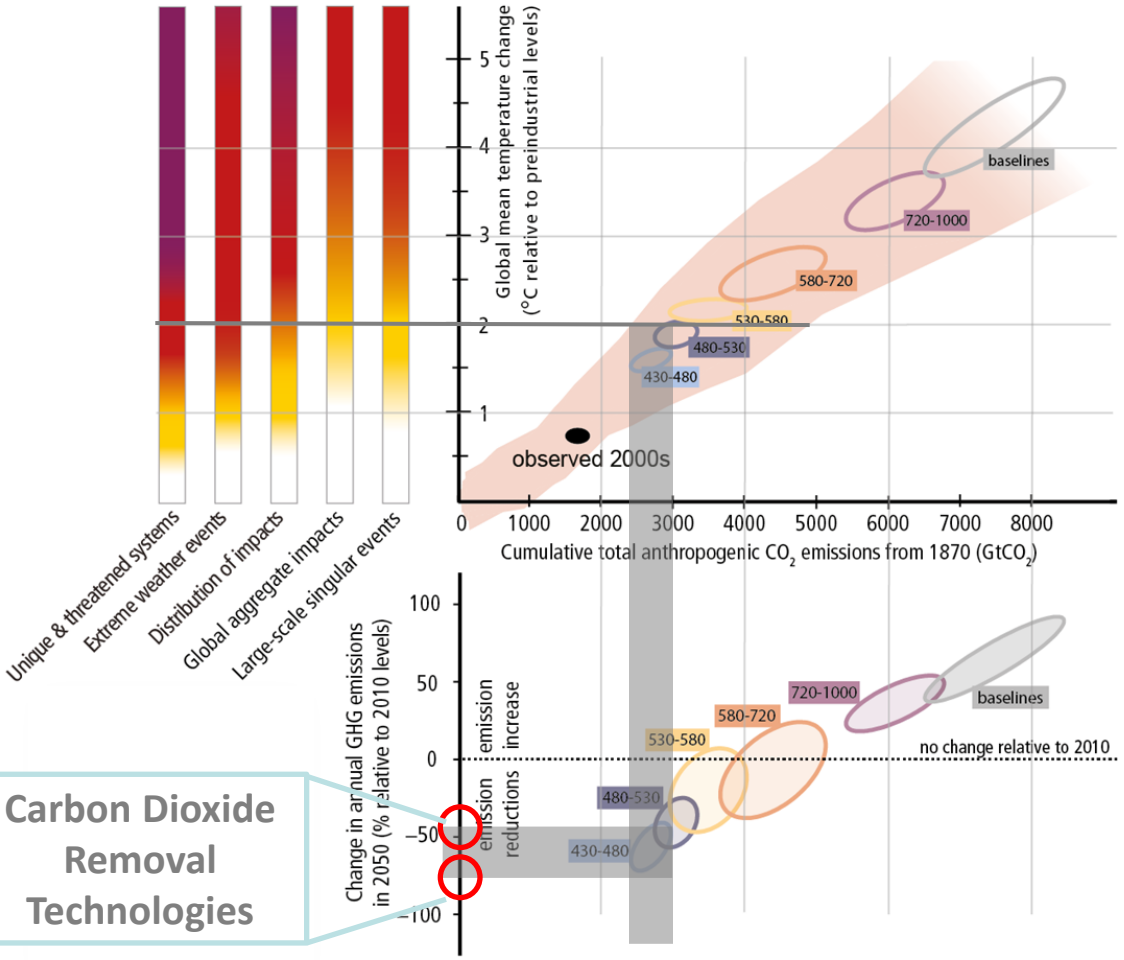
Steckel, Edenhofer and Jakob, in press

Risks from climate change depend on cumulative CO_2 emissions…



Based on SYR Figure SPM.10

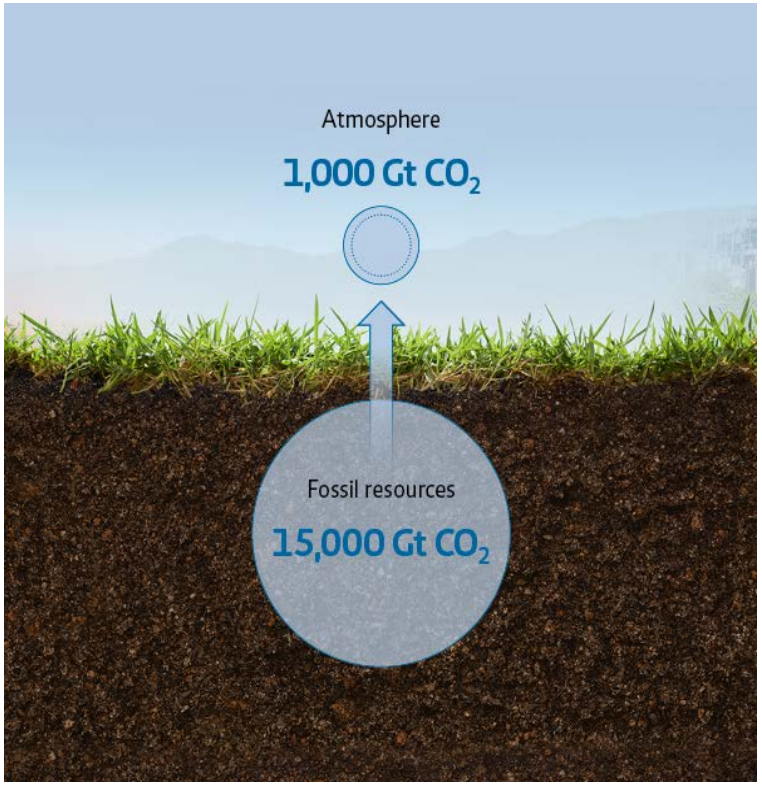
...which in turn depend on annual GHG emissions over the next decades.



Carbon Dioxide Removal Technologies

Basiert auf SYR IPCC AR5 Figure SPM.10

The climate problem at a glance

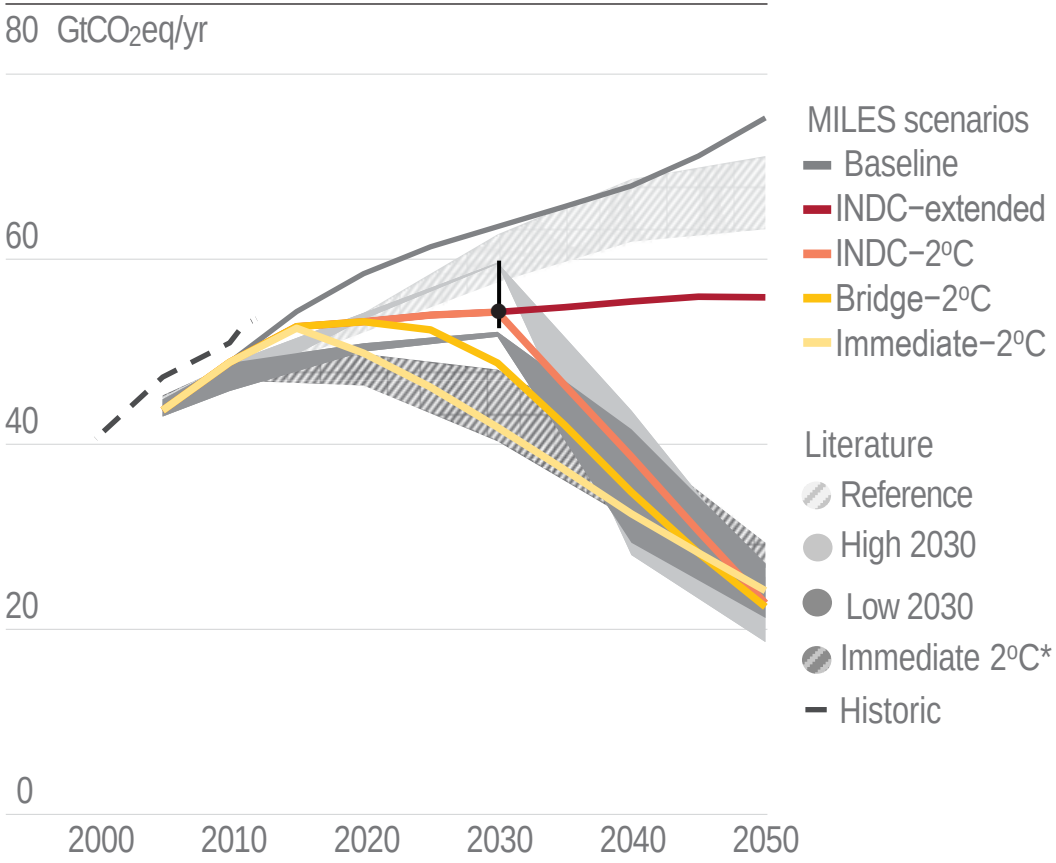


Resources and reserves to remain underground until 2100 (median values compared to BAU, AR5 Database)

Until 2100	With CCS [%]	No CCS [%]
Coal	70	89
Oil	35	63
Gas	32	64

Source: Bauer et al. (2014); Jakob, Hilaire (2015)

INDC scenarios
Greenhouse gas emissions



Source: REMIND model calculations, EDGAR (JRC/PBL, historical emissions), PBL INDC Tool calculations (www.pbl.nl/indc INDC range and best estimate, vertical black line and circle) and IPCC AR5 scenario database

* Figure D of the policy report „Beyond the numbers: Understanding the Transformation Induced by INDCs", October 2015, by the MILES project consortium

Baseline: SSP2 GDP and Pop. and no climate policy**.**

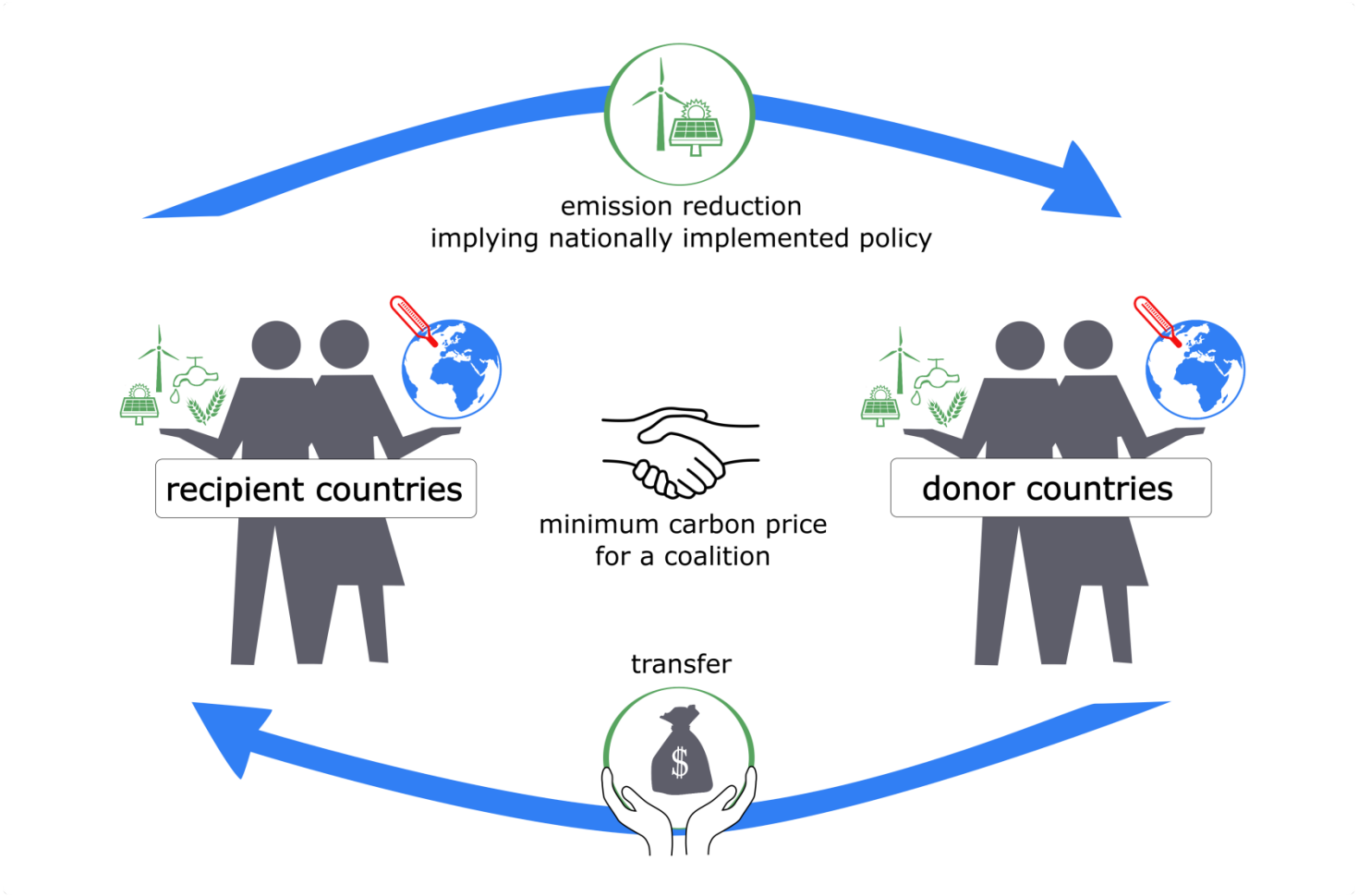
INDC-extended: conditional INDCs PBL best guess and extrapolation, assuming carbon price increase w. 1.5% after 2030, overlaid with convergence of carbon price across regions, so stronger growth rates in regions with low prices in 2030 (see next slide) and vice versa.

INDC-2°C: until 2030 like above, after 2030 unanticipated phase-in of optimal carbon price globally to reach 2°C (RCP 2.6)

Bridge-2°C: until 2020 like above, after 2020 anticipation of optimal carbon pricing from 2035 onwards, but still the low INDC carbon prices in 2025 and 2030.

Immediate-2°C: optimal pricing for 2°C after 2015.

Minimum Carbon Price and Transfers



King Coal and the Queen of Subsidies

ENERGY

King Coal and the Queen of Subsidies

The window for fossil fuel subsidy reform is closing fast

By **Ottmar Edenhofer**

Coal is the most important energy source for the Chinese economy (see the photo). Other rapidly growing economies in Asia and Africa also increasingly rely on coal to satisfy their growing appetite for energy. This renaissance of coal is expected to continue in the coming years (*1*) and is one of the reasons that global greenhouse gas (GHG) emissions are increasing despite the undisputed worldwide technological progress and expansion of renewable technologies (*2*). The implications for long-term GHG emissions are serious because, once installed, a coal power plant will emit for decades. Fossil fuel subsidies support investments in coal capacities around the globe and thereby threaten the achievement of climate change mitigation goals. Targeted reform of these subsidies could yield benefits for climate change mitigation as well as other development objectives.

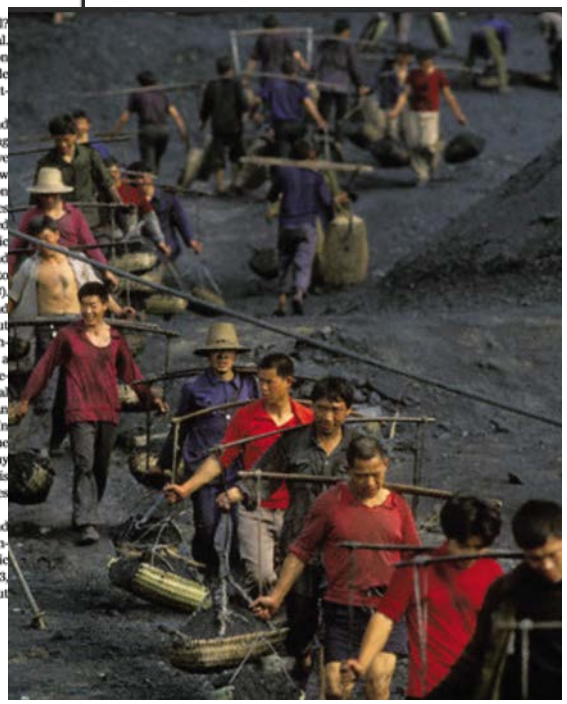
The existing global energy infrastructure already commits 729 gigatons of CO_2 ($GtCO_2$) of future cumulative emissions over its lifetime. Aims to limit global temperature increase to 2°C allow for a total of 1000 $GtCO_2$ to be released into the atmosphere. If only one-third of currently planned coal capacity is installed successfully, an additional 113 $GtCO_2$ emissions are committed, nearly depleting the budget allowed by such mitigation targets (*3*).

Over the past year, many nations have made commitments to reduce their domestic GHG emissions. The U.S. government has announced plans to reduce emissions in the power sector by 32% below 2005 levels in 2030 through its Clean Power Plan (*4*). The wide emissions are expected to continue to rise. After all, a reduction in coal demand in one region reduces world market prices, incentivizing an increasing demand in other regions (*6*).

What explains this renaissance of coal? The short answer is the relative price of coal. The price of coal-based electricity generation remains much lower than that of renewable power when the costs of renewable intermittency are taken into account.

As a result of technological progress and economies of scale, the costs of generating electricity from wind and solar power have declined substantially. Wind generation now costs 70 US$ per megawatt-hour (MWh) on average, and geographically favorable sites can compete with the costs of coal-fired power (~50 US$/MWh). Solar photovoltaic projects have reached 80 US$/MWh and within a few years can also be expected to match the costs of coal generation (*7*, *8*). However, the costs of intermittency of wind and solar add an additional markup of about 30 US$/MWh (*9*) in cases where these technologies are deployed on a large scale as a result of increasing backup capacity requirements. Because of these additional costs, coal becomes more attractive for investors than renewable sources in many countries. In addition, coal is increasingly traded on the world market, dashing the hopes of many concerned with climate change that coal is only economically viable for a few countries with large domestic endowments (*1*).

At the same time, finance ministers around the globe subsidize fossil fuels, mostly by enabling the sale of these fuels on the domestic market below world market prices. In 2013, these pretax subsidies amounted to about



Source: Science, 18. September 2015, Vol 349, Issue 6254, 1286ff

Climate Policy and Poverty reduction - A contradiction?

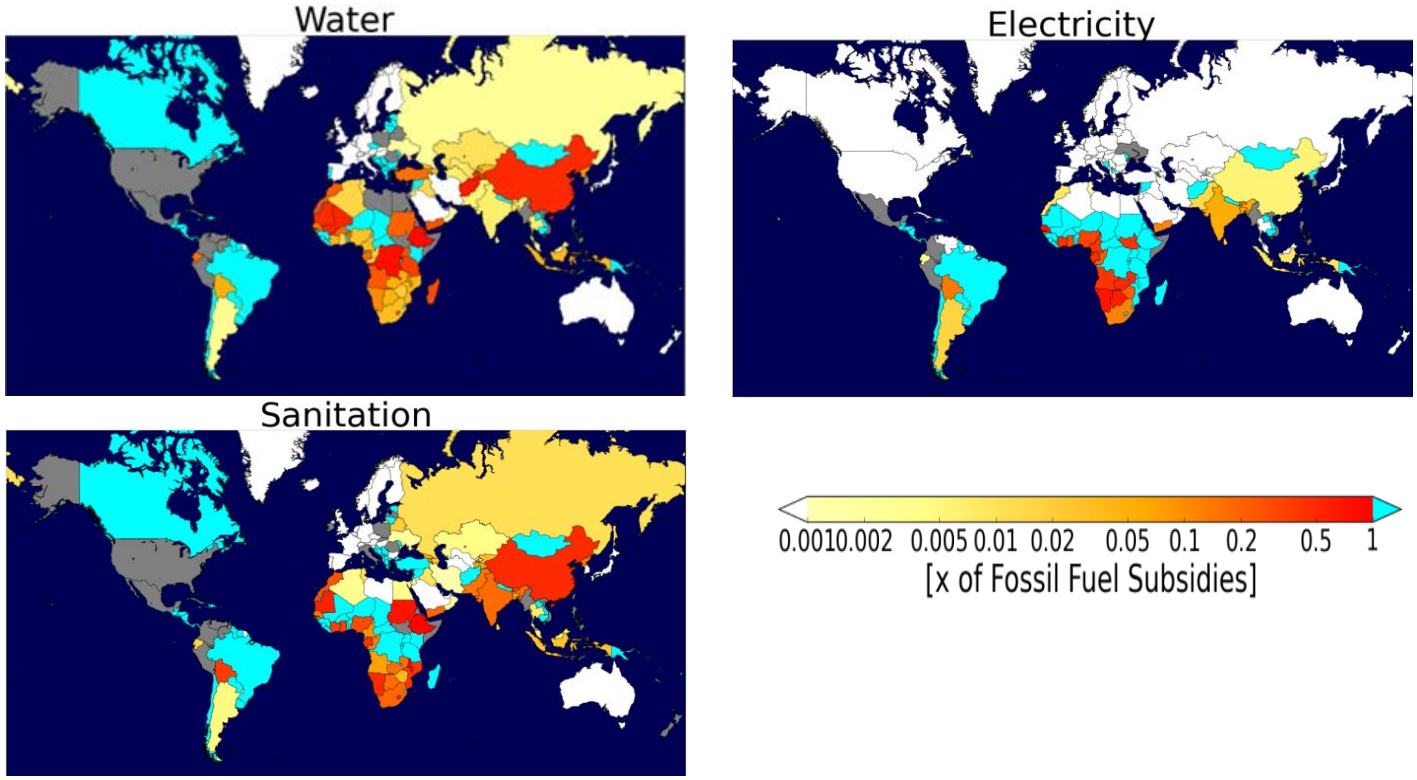
Water availability

Sanitation

Telecommunication

Access to electricity

Fossil Fuels Subsidy Reform



Jakob et al. (2015)

- Redirect fossil fuel subsidies to infrastructure from 2015 to 2030
- Roughly 80 countries do not have universal access to water, sanitation, and electricity
- Universal access to clean water could be provided in about 70 countries
- Improved sanitation in about 60 countries
- Access to electricity in about 50 countries

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Thank you for your attention!

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