

Economic Growth and Climate Policy

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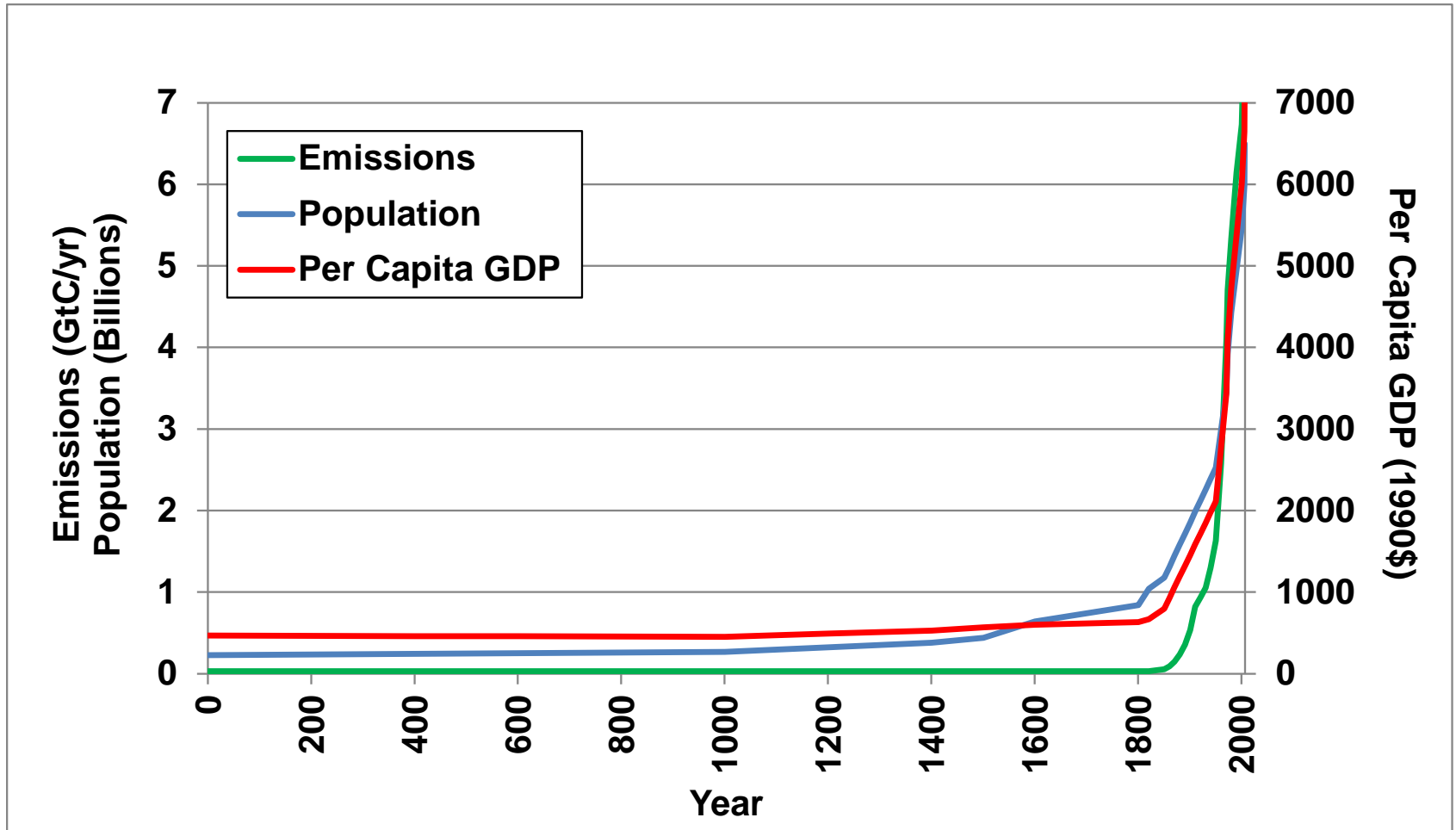
Prof. Dr. Ottmar Edenhofer
Dr. Michael Jakob / Linus Mattauch



Outline

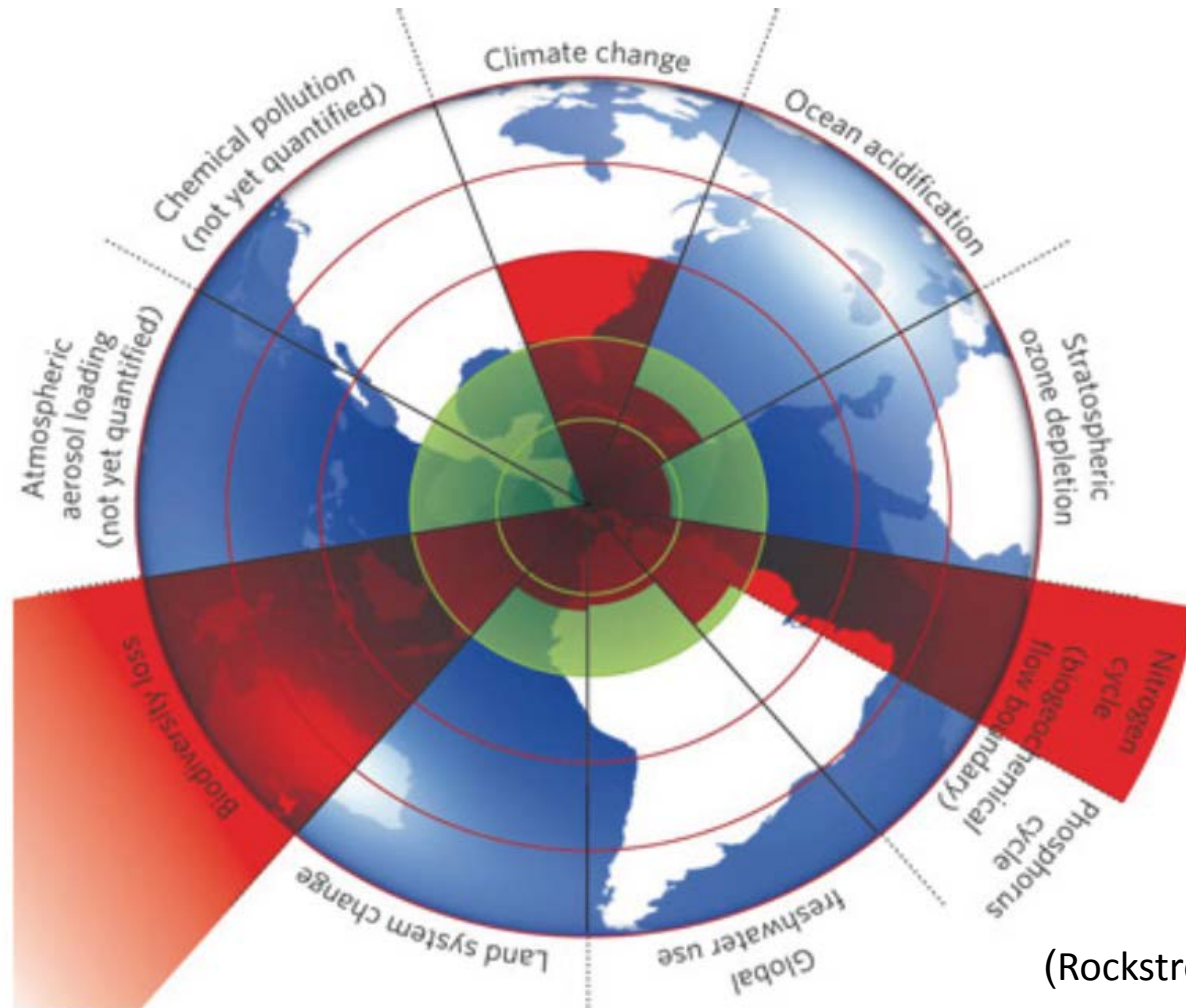
1. Is continued economic growth *feasible*?
2. Is continued economic growth *desirable*?
3. Are our investments on the right track?
4. Conclusions

The fossil fuel jackpot!



Edenhofer et al. 2012

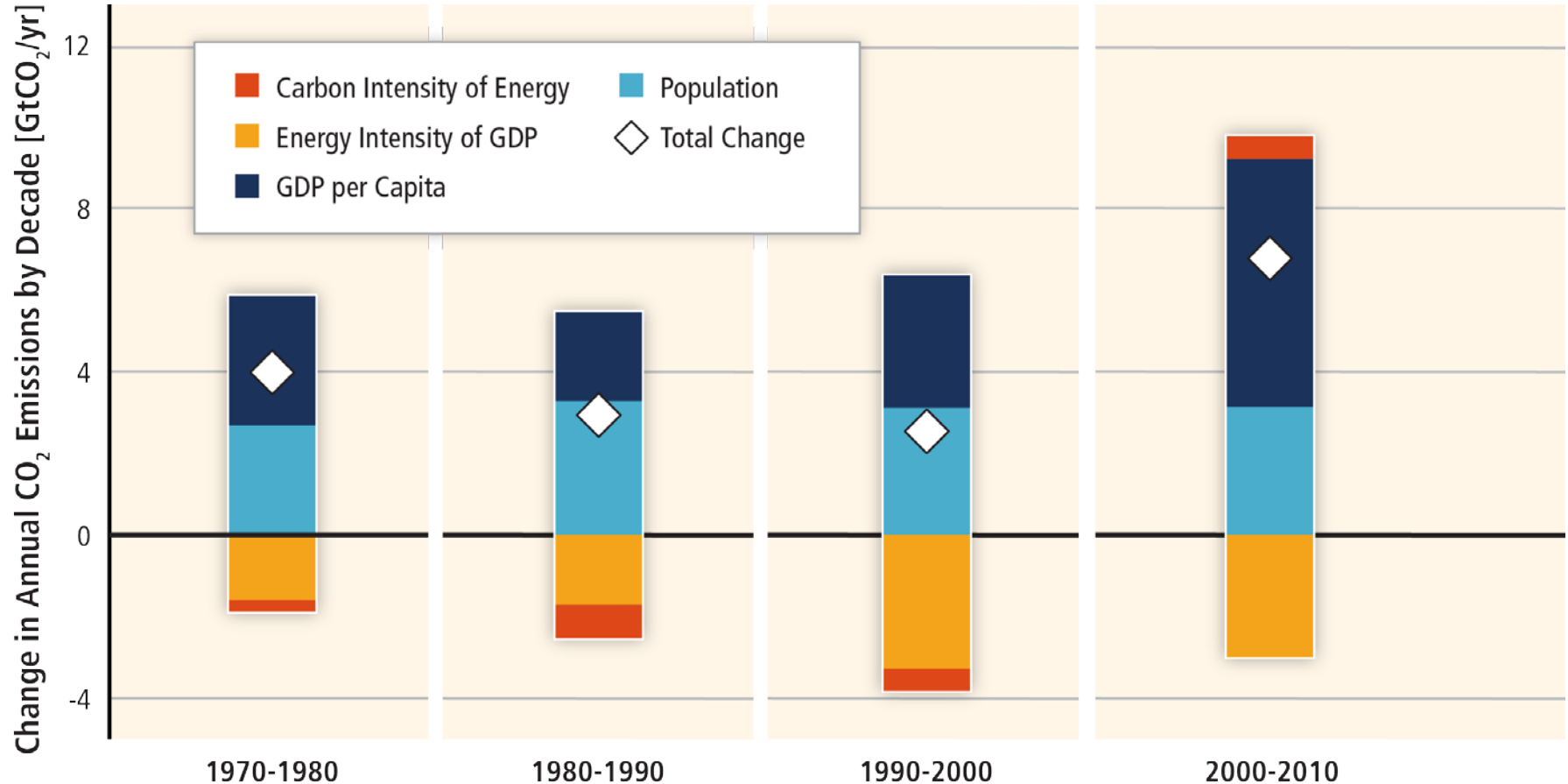
Environmental consequences of overuse



(Rockström et al., 2009)

Anthropogenic pressures on the Earth System have reached a scale where abrupt global environmental change can no longer be excluded.

We're not on track, not even close.



IPCC WG3 Figure SPM.3 (2014)

Decomposition of the change in total annual CO₂ emissions from fossil fuel combustion by decade and four driving factors

Green Growth to the rescue?

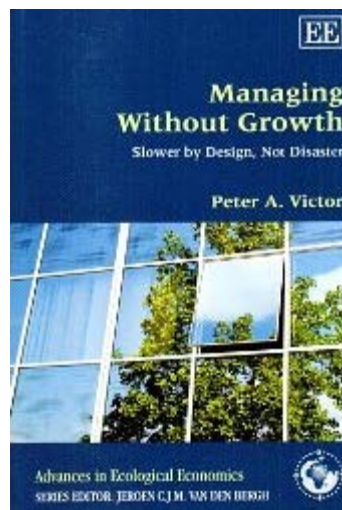
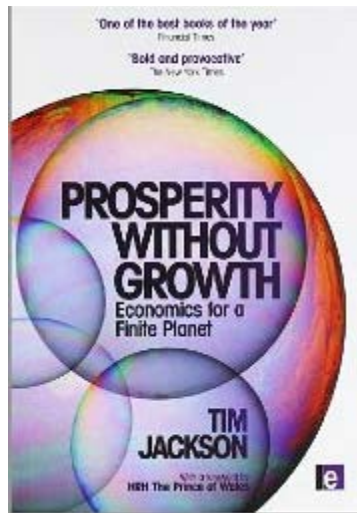
Can we keep up economic growth and still protect the environment?

Green Growth is not well defined as a concept and empirical evidence is missing...

...so could degrowth be the easier route to emissions reductions?

Degrowth is at least conceivable as a new post-materialistic lifestyle in industrialized countries...

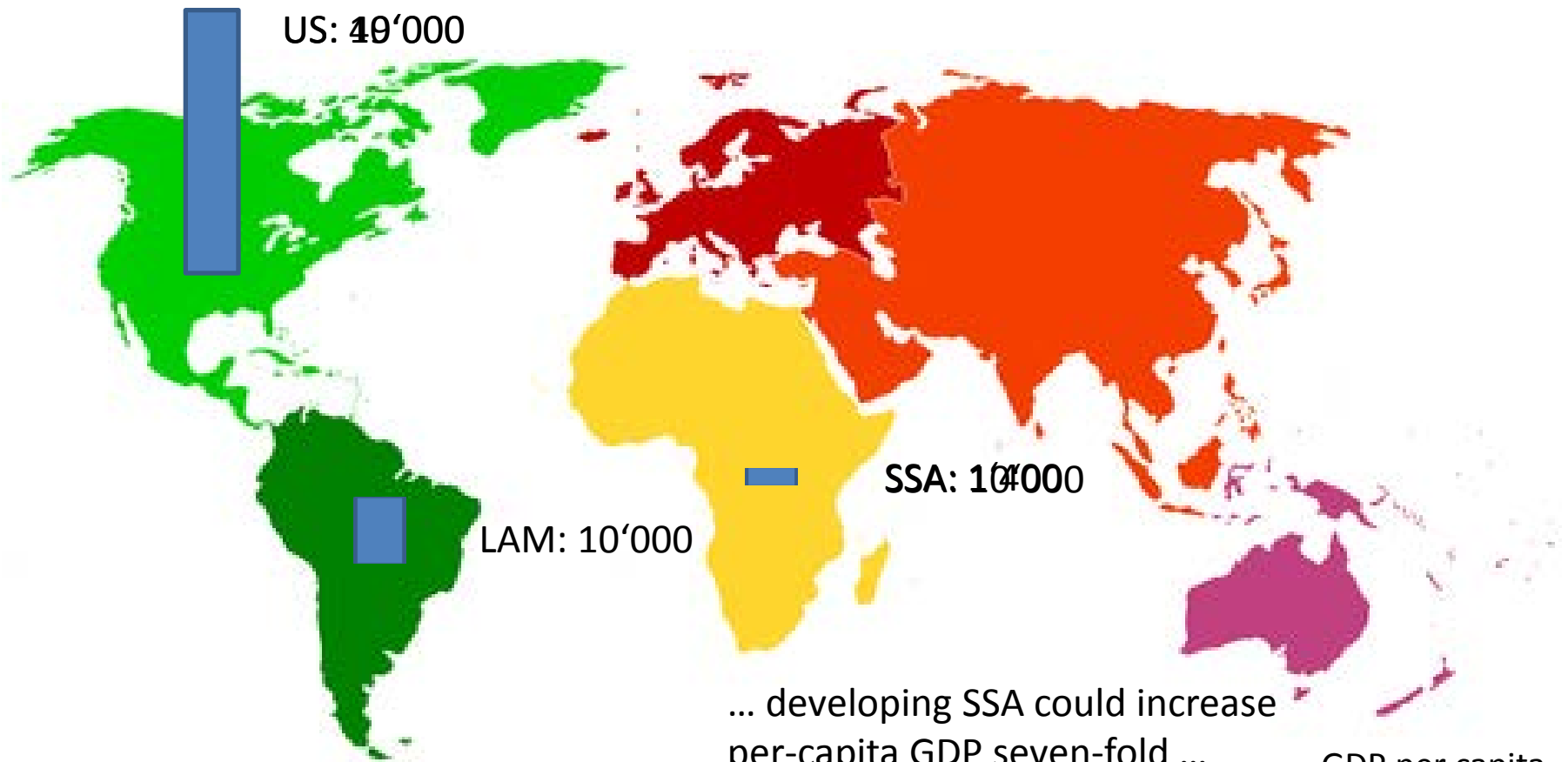
...but how should this be put into practice in poor countries?



What does degrowth mean for income distribution?

...and the US would have to degrow by about 80%

If global income were distributed equally...



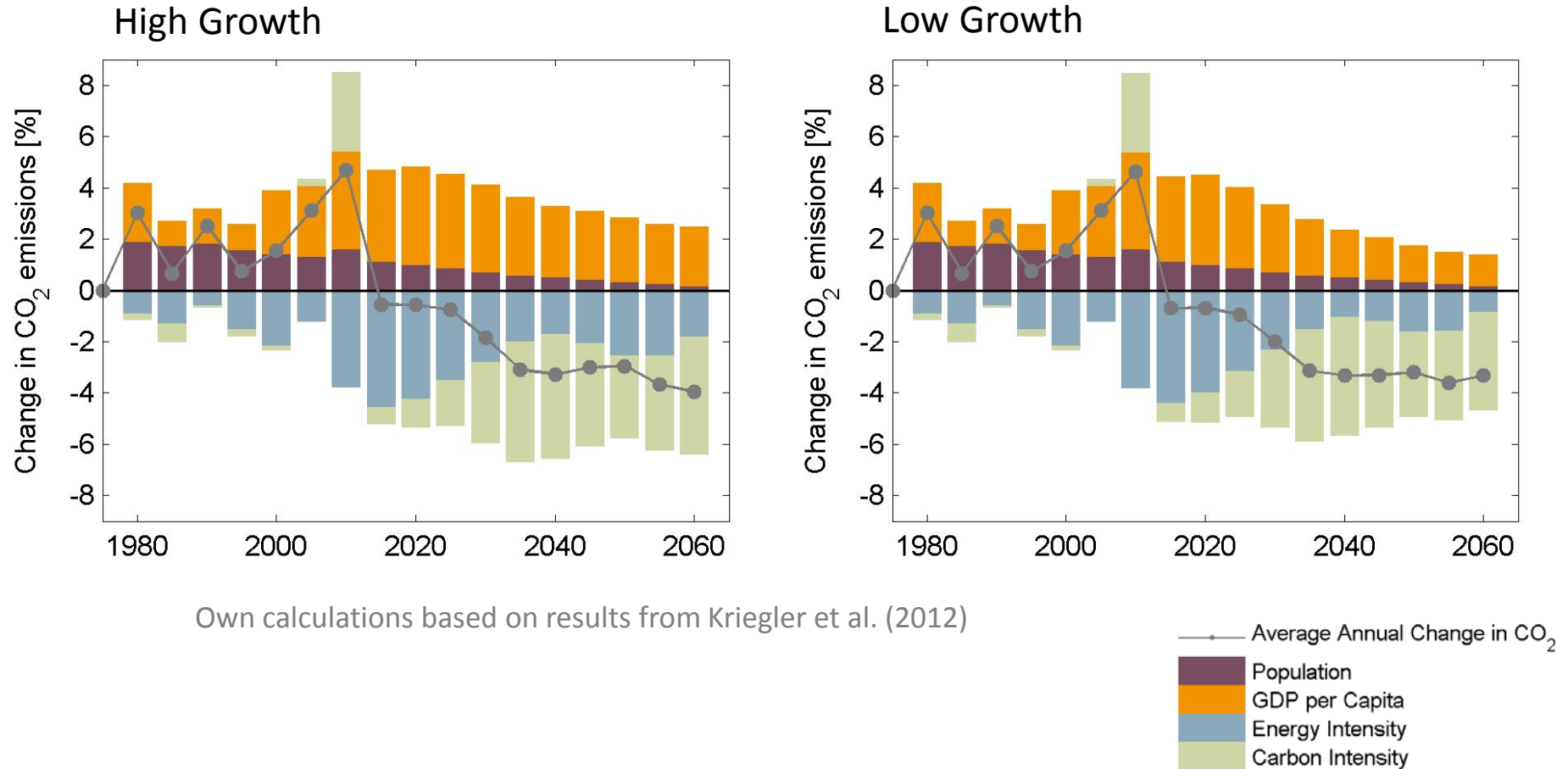
...LAM would remain at the current level...

... developing SSA could increase per-capita GDP seven-fold ...

GDP per capita
in current US\$

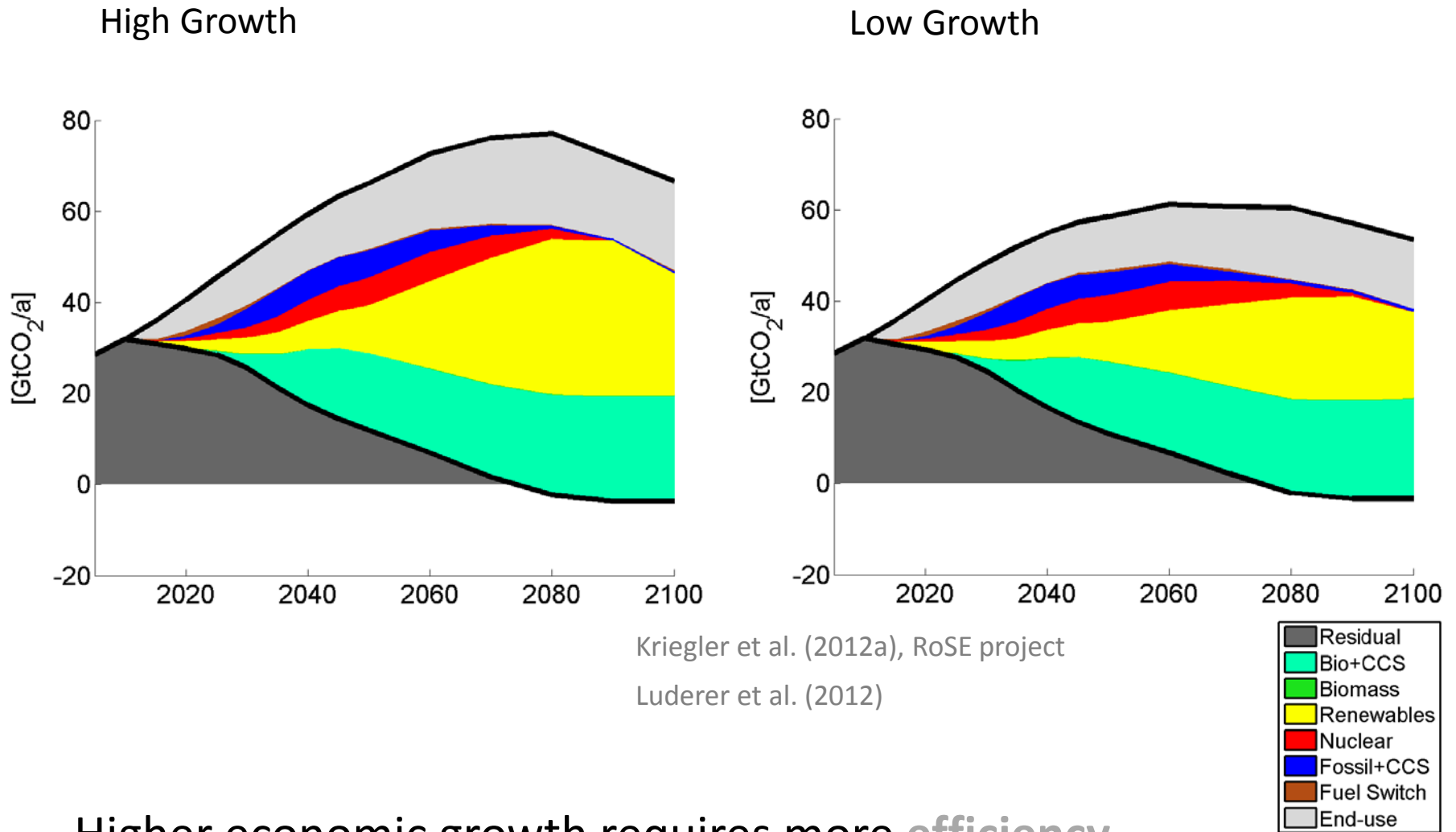
(Source: WDI 2012) 9

450ppm with high and low growth



Higher **economic growth** has to be compensated by higher **energy** and **carbon** intensity improvements.

Technological differences due to economic growth



Higher economic growth requires more **efficiency improvements** and **renewables**.

Limiting global warming to $<2^{\circ}\text{C}$ requires reducing carbon intensity of GDP ($\text{CO}_2/\text{US\$}$) by $\sim 4\text{-}7\%$ per year. Degrowth might achieve reductions by 2%...

... but where should the other
roughly 2-5% come from?

A degrowth strategy would reduce these risks indirectly, at best...

...and it would be expensive. We have to distinguish the *ends* that a policy should achieve from its *means*.

What do sensible climate policies look like?

- Carbon pricing (e.g. carbon tax, emissions trading)
- Technology policies (e.g. feed-in tariffs, R&D subsidies)
- Insurance schemes against technological risks
- Land-use management (land taxation)

If all environmental goals can be reached and technological risks addressed by appropriate policy instruments, why deliberately slow down economic growth?

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Is continued economic growth desirable?

What do critics of materialism say?

- Conspicuous consumption
- Consumer manipulation through advertising
- Stress, risk of depressions
- Loss of meaning
- ...



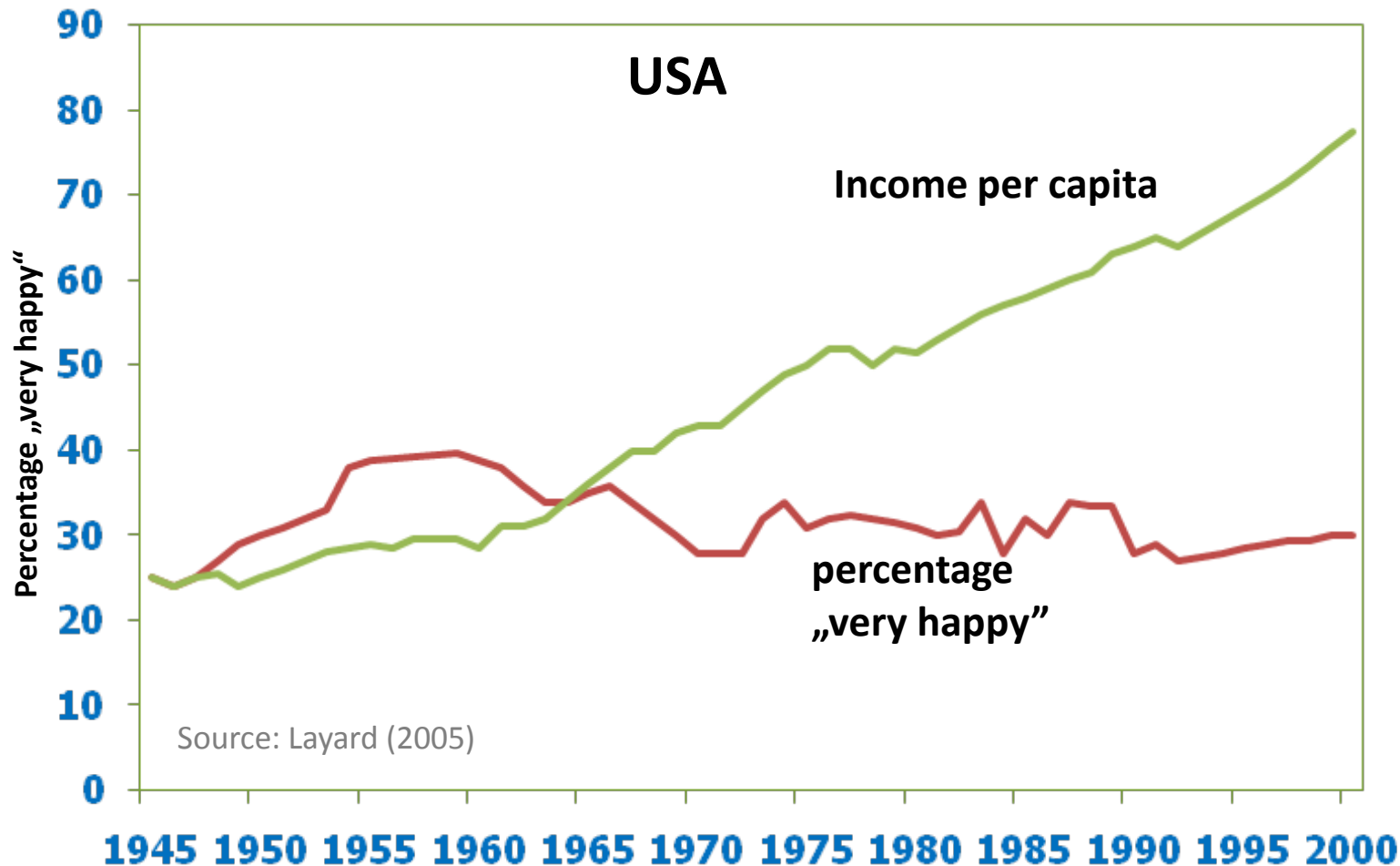
Source: Wilkinson and Pickett (2009)

Growth is no end in itself...
...but it could serve to increase well-being.
But, what is well-being?

Concepts of well-being

- **Economics:** Well-being is the *realisation of preferences*.
 - **Liberalism:** You should get what you want.
- **Social psychology:**
 - **Life satisfaction („happiness“):** *Subjective judgement* of personal well-being
 - **Meaning:** *Subjective judgement* of the meaning of one's life
- **„Happiness“ and „Meaning“ are different: humans often decide not to chose what makes them happy, because:**
 - They have other goals in life than being happy.
 - They want to be happy, but make the wrong choices.

GDP and life satisfaction



Easterlin paradox: proven for US, but disputed for other countries (Easterlin et al. 2010, Stevenson and Wolfers 2008)

What is the relation between happiness and income?

Two relevant psychological effects:

State competition

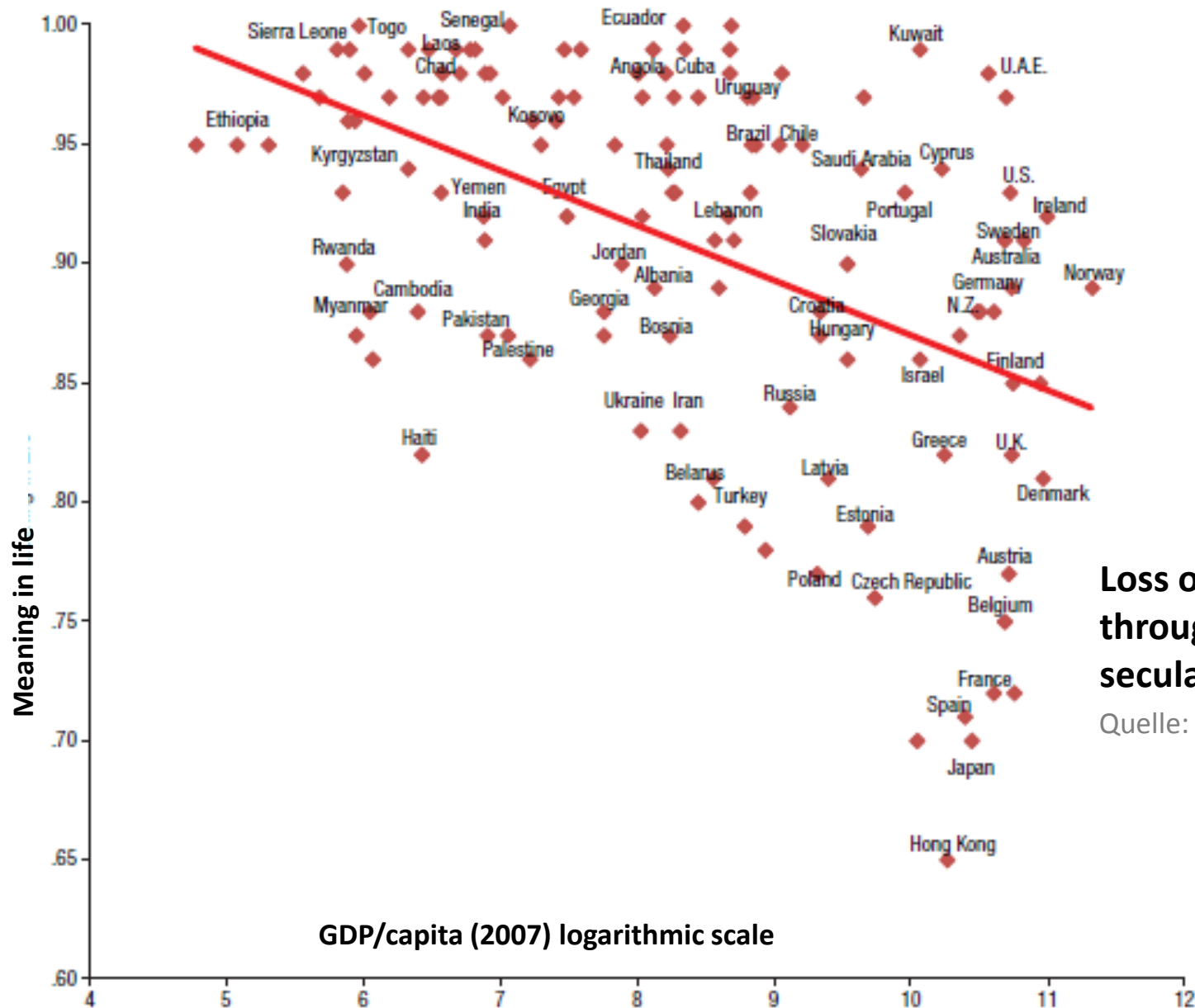
- Comparing income to other members of society
- Maximizing happiness would require taxation, that would decrease growth. Why? Because there is an externality.
- Liberalismus not unconditionally

Familiarization (Adaptation)

- Wrong prediction of one's own familiarization with new things, e.g., consumption goods
- Maximizing happiness would require taxation, that would decrease growth. Why? Because familiarization does not leave people happy, growth is dysfunctional
- No reason for taxation from liberal point of view

Layard (2005). Clark, Frijters and Shields (2008), Frey (2008).

GDP and the meaning of life



Loss of meaning not through income, but secularization!

Quelle: Oishi und Diener (2014)

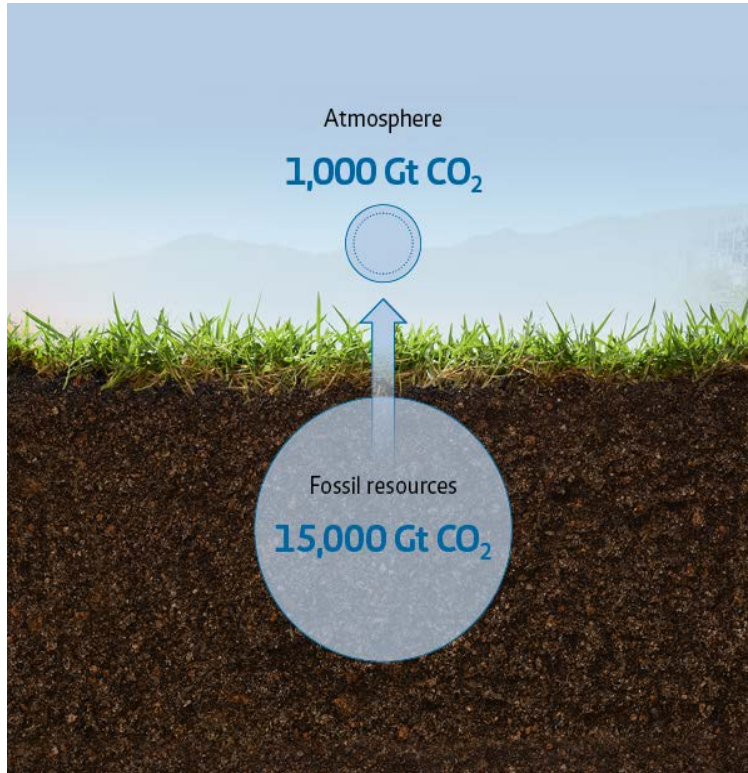
Hence, growth might not be desirable per se, but
there is no reason to restrict economic growth
directly...

...and we need to think about how we define social
welfare in the first place instead –
or more technically: How can we define the social
welfare function?

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The climate problem at a glance

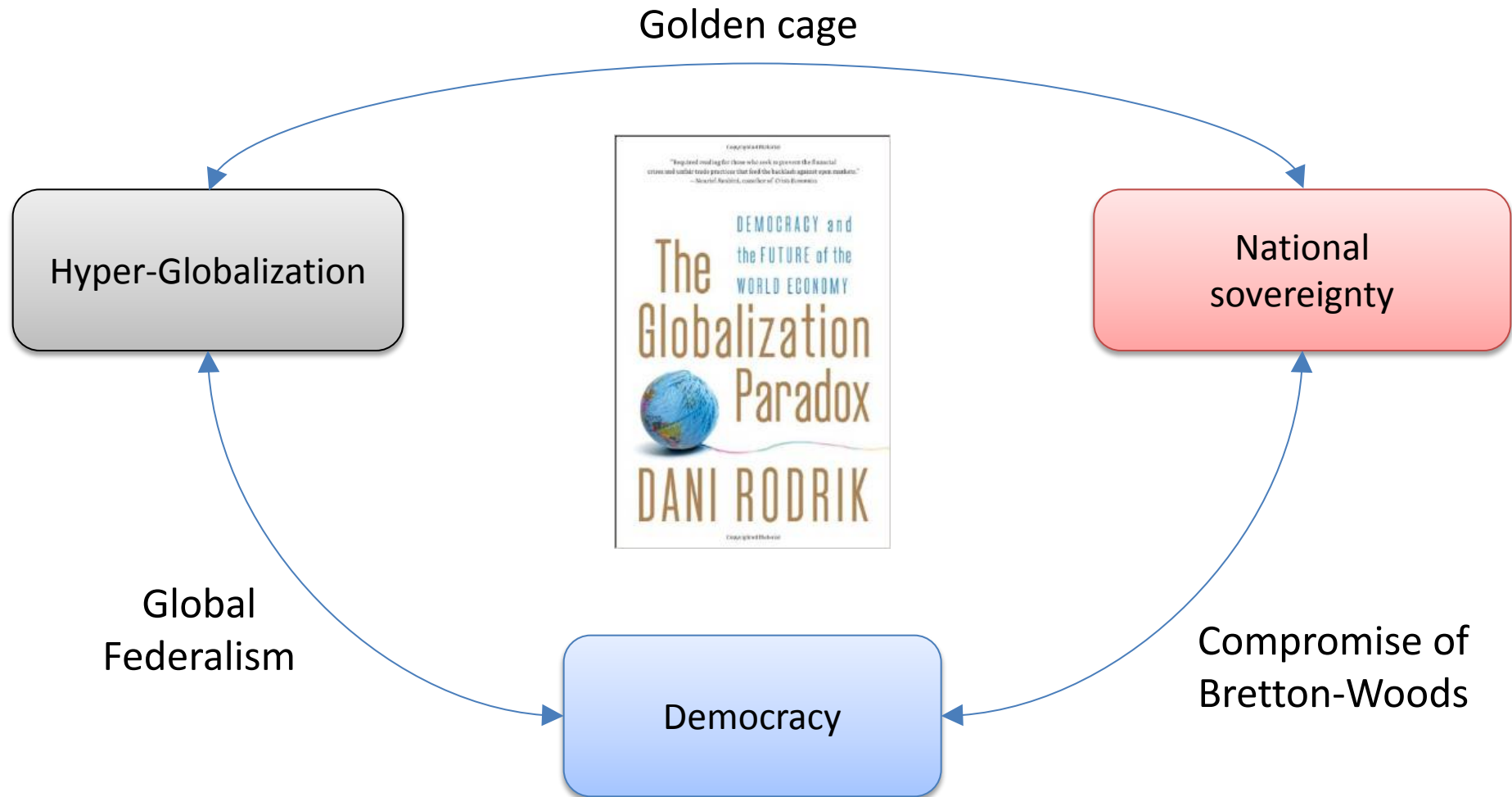


Resources and reserves to remain underground until 2100 ((median values compared to BAU, AR5 Database)

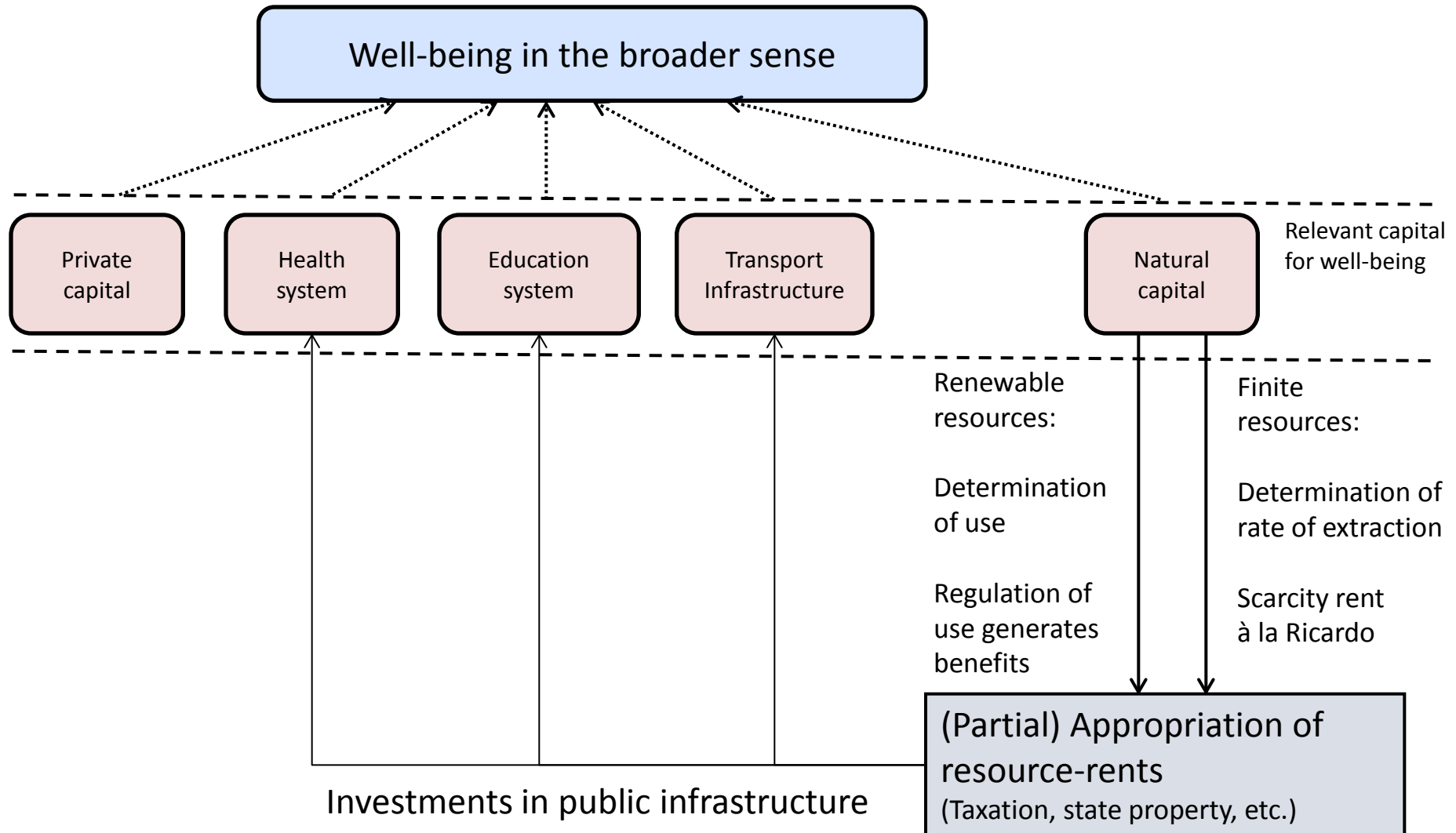
	With CCS [%]	No CCS [%]
Coal	70	89
Oil	35	63
Gas	32	64

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

The Globalization Paradox: A trilemma

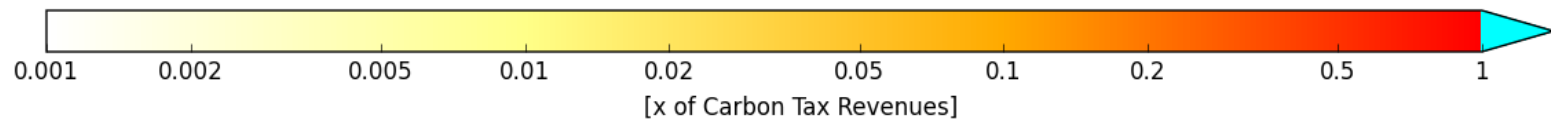
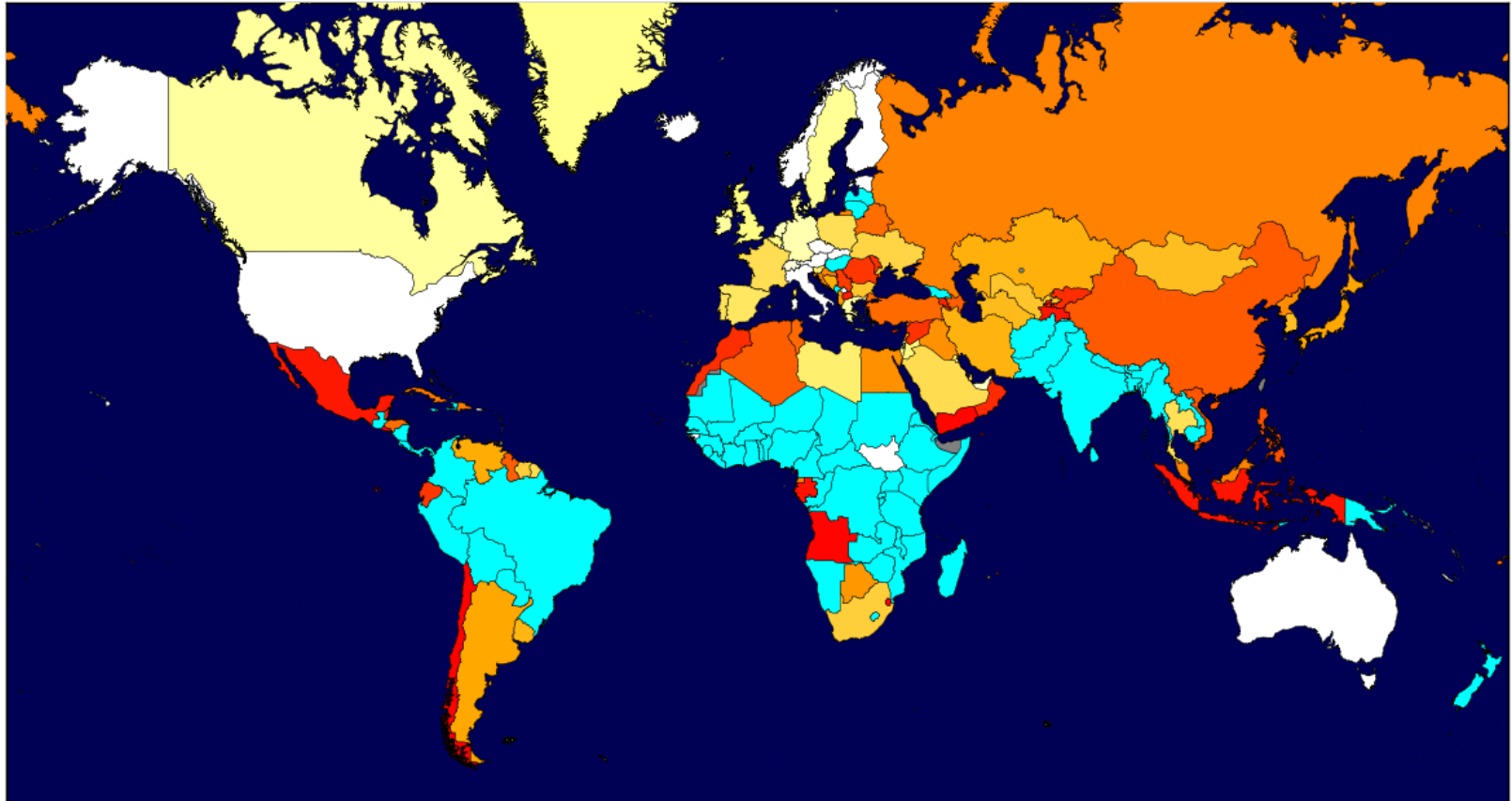


Lack of social investments in infrastructure?



Revenues from carbon pricing

Total cost of closing gaps in electricity, water, sanitation, ICT, and roads



450ppm scenario with national carbon prices (no re-distribution)

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Conclusions

- Continued economic growth seems feasible, at least from the perspective of climate change mitigation, provided that externalities are properly addressed.
- Economic growth cannot be a goal in itself. But it could help to reach desirable goals (e.g., happiness, prosperity...).
- Public policy should not primarily be concerned with *growth*, but with *welfare*.
- Different members of society do not necessarily have to agree on a definition of welfare. But they have to agree on how to manage common pool resources and common property regimes.

The central question for economic policy is not growth, green growth, or degrowth, but *whether there is over- or underinvestment in common pool resources!*