

Was kostet die Welt?

Klima- und Umweltschutz angesichts wirtschaftspolitischer Wachstumshörigkeit

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Institute for Ecological Economics

Das Ende des Wachstums?

Alternativen zur Verplanung und Verbauung unserer Zukunft

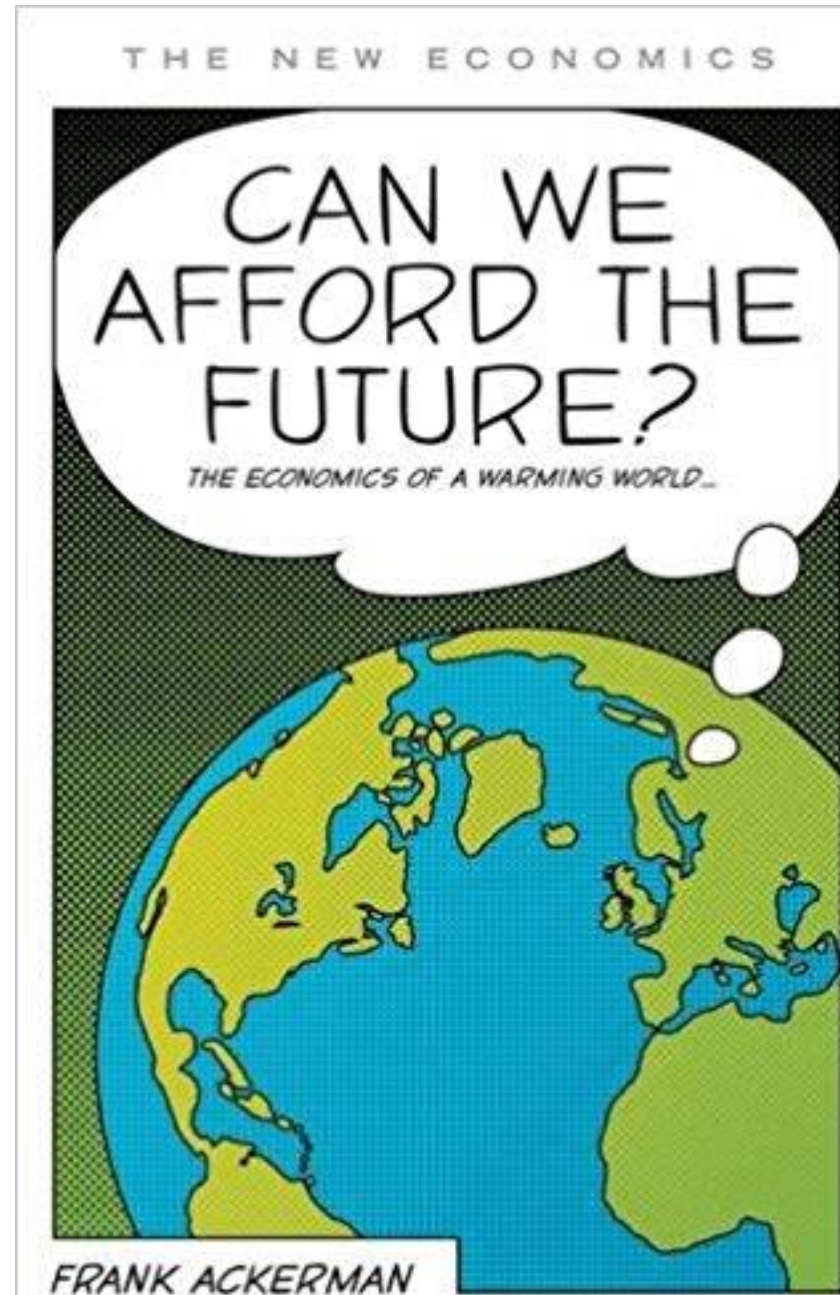
7. ORTE-Raumplanungssymposium, St. Pölten

23.11.2017

Why Are We Waiting?

THE LOGIC, URGENCY, AND PROMISE
OF TACKLING CLIMATE CHANGE

Nicholas Stern

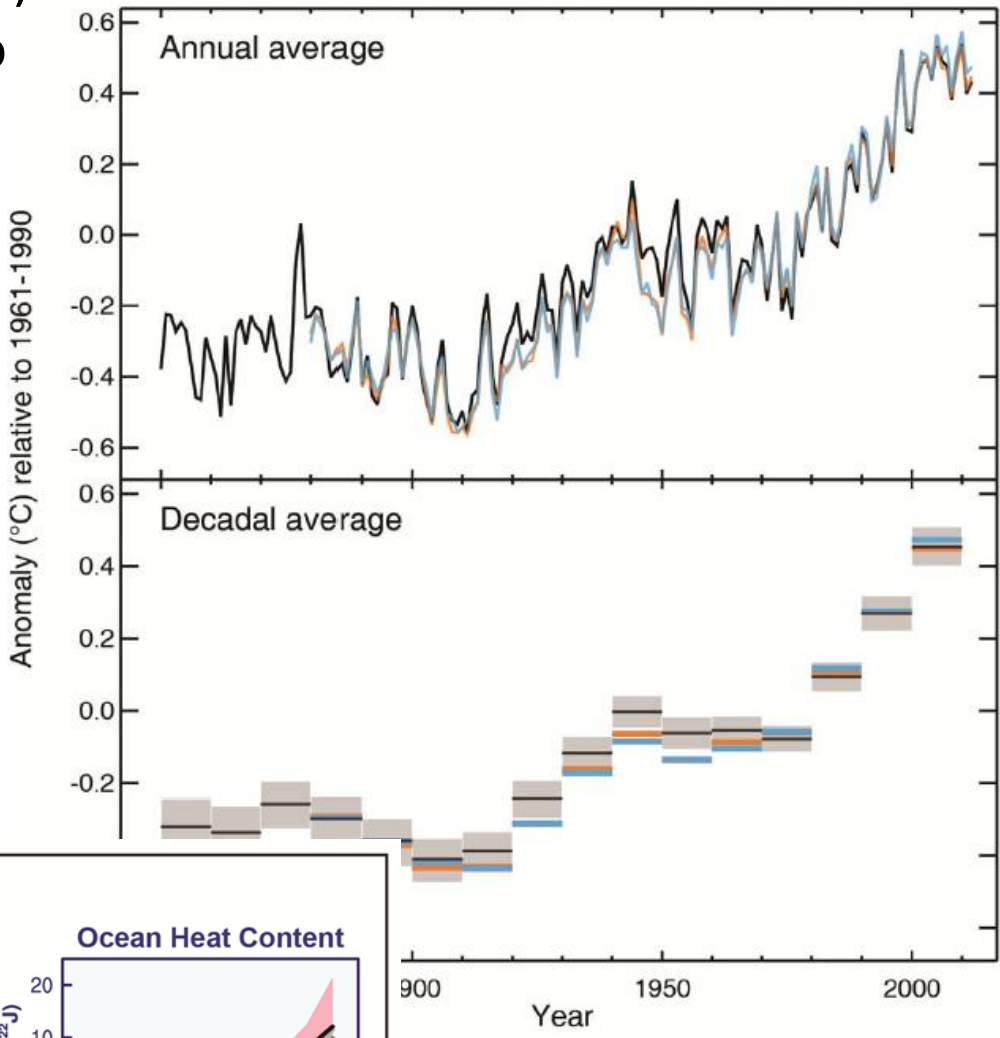


Ignore nature – for how much longer?

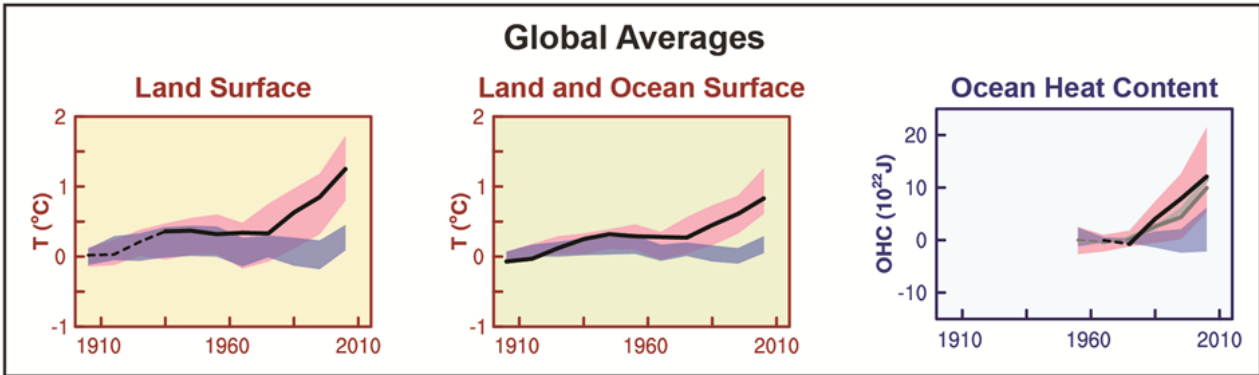
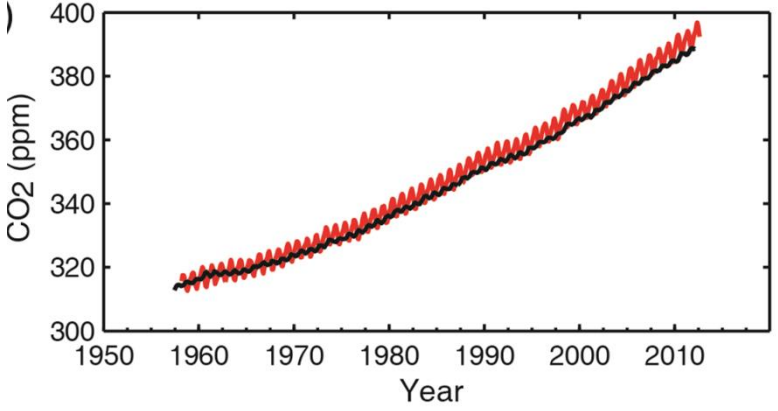


IPCC WG1 (The Physical Science Base) presented in Sep 2013 their input to the Fifth Assessment Report, which will be presented in Oct 2014.

Observed globally averaged combined land and ocean surface temperature anomaly 1850–2012

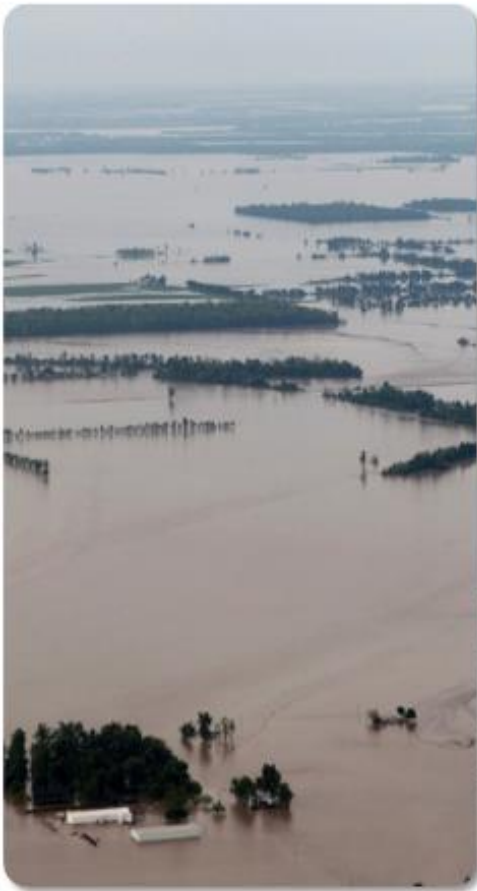


Atmospheric CO₂



Observations
 Models using only natural forcings
 Models using both natural and anthropogenic forcings

A changing climate leads to changes in extreme weather and climate events

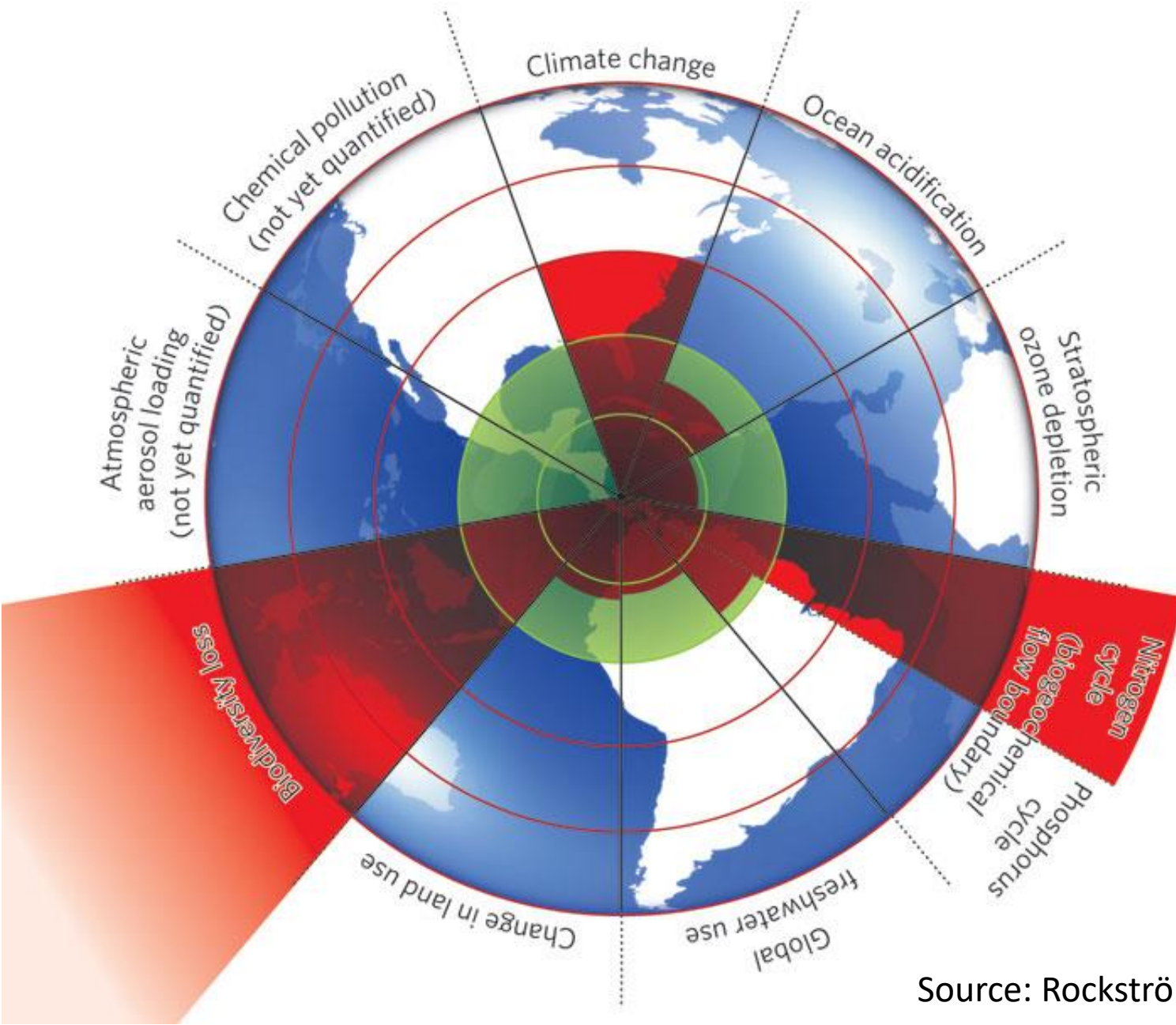


Since 1950, **extreme hot days** and **heavy precipitation** have become more common



There is evidence that anthropogenic influences, including increasing atmospheric **greenhouse gas concentrations**, have changed these extremes

Earth system boundaries and human interference



Source: Rockström, Steffen et al. 2009

Global Change

International Geosphere-Biosphere Programme

Issue 78 ■ March 2012

ANTHROPOCENE

The geology of humanity

Urban expansion
No signs of slowing

Natural catastrophes
2011 breaks records

GLOBAL
IGBP
CHANGE

www.igbp.net
Earth-system science for a sustainable planet



THE NEXT GOLDEN STATE: A 16-PAGE SPECIAL REPORT ON AUSTRALIA

The Economist

MAY 28TH - JUNE 3RD 2011

Economist.com

Obama, Bibi and peace
Huntsman blows his horn
A soft landing for China
The costly war on cancer
How the brain drain reduces poverty

Welcome to the Anthropocene

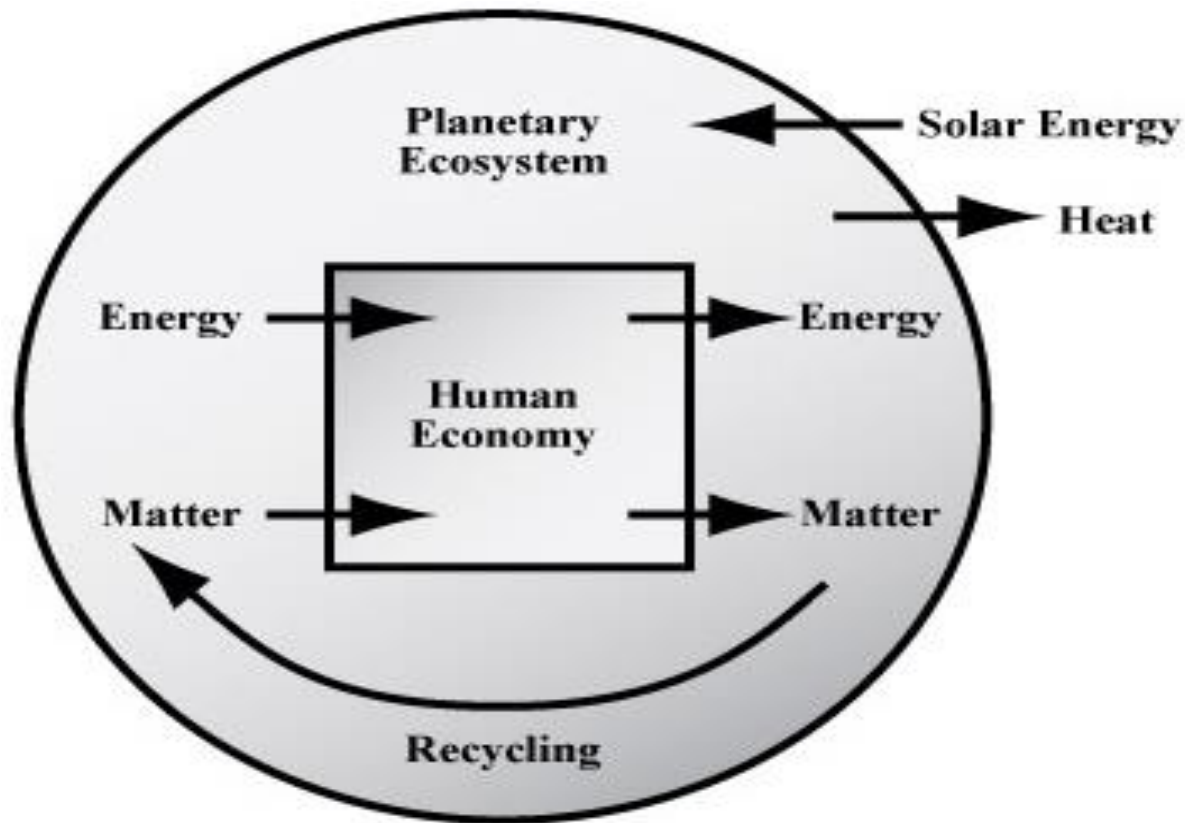


Geology's new age

Empty World – Full World (Herman Daly)

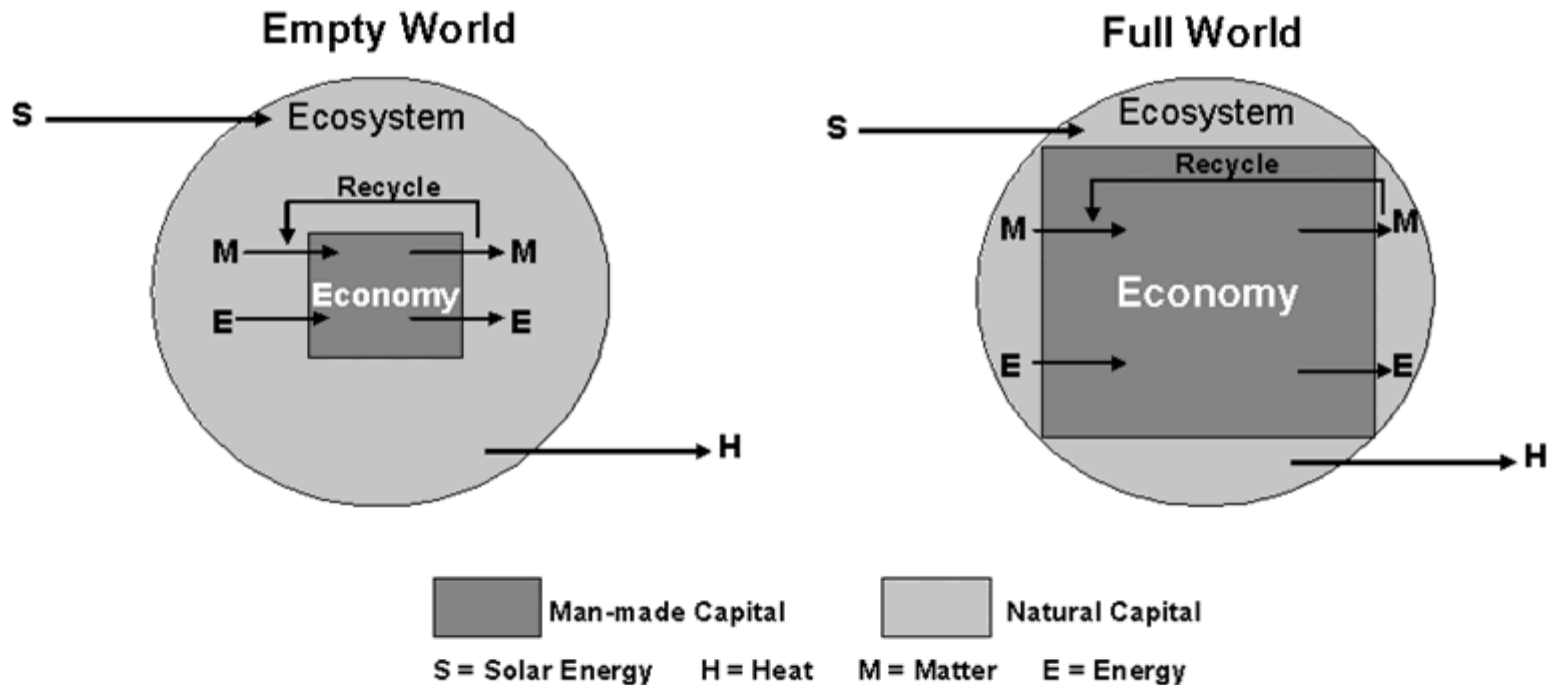


Economy in its biophysical context



Source: Daly, 1996

Empty World – Full World (Herman Daly)



Der Weg zum Wachstumsparadigma

- Die Verengung von Wirtschaftswachstum als Hauptziel von Wirtschaftspolitik ist erst ab Mitte des 20. Jahrhunderts zu beobachten.
- Andere Ziele wie Stabilität, Sicherung der Wohlfahrtssysteme, soziale Inklusion durch Arbeit geraten dabei in den Hintergrund
- **„The economic growth paradigm“** Herman Daly (Ecological Economist)
- Auch in der Ökonomik als Wissenschaft ist eine Konzentration auf das Thema Wirtschaftswachstum zu beobachten. Wachstum wird dabei als Proxy für andere soziale Ziele gesehen → die Verbindung ist jedoch schwach.

Der Weg zum Wachstumsparadigma

- Getragen wurde der Wandel von mehreren Wirtschaftspolitischen Zielen zu einem von einem Konnex aus WirtschaftspolitikerInnen, Verwaltungsangestellten und ÖkonominInnen
- Dies geschah beispielsweise durch internationale Organisationen wie die OECD
- “A common value system at the level of civil servants in the OECD countries that should form the basis for consensually shared definitions of problems and solutions in economic policy making“ *Thorkil Kristensen (erster OECD Generalsekretär)*



Quelle: Schmelzer, M. *The Hegemony of Growth. The OECD and the Making of the Economic Growth Paradigm.* Cambridge: Cambridge University Press, 2016

Der Weg zum Wachstumsparadigma

- Die Verengung von Wirtschaftspolitik auf Wirtschaftswachstum ging – durch die OECD – mit der Entwicklung der **Volkswirtschaftlichen Gesamtrechnung (VGR)** einher
 - VGR wurden von Richard Stone für die OECD und die UN entwickelt
 - Kern der VGR ist die Entstehung, Verteilung und Verwendung der Bruttoinlandsprodukt (BIP)
 - BIP = Gesamtmaß aller Güter, Waren und Dienstleistungen die innerhalb eines Jahres und Landes (abzüglich Vorleistungen) erstellt wurden
 - Steigen des BIP = Wirtschaftswachstum

Der Weg zum Wachstumsparadigma

Häufige Sichtweise:

- Wohlstand als Wachstum
 - Steigerung des BIP pro Kopf gleichbedeutend mit einer Vermehrung des Wohlstands
 - Andere ges. Ziele (Bildung, Sozialsystem, Umweltschutz) nur durch Wirtschaftswachstum erreichbar
-
- "Was wir tun müssen, ist, dass wir den Bürgern weiterhin deutlich machen, dass Wohlstand, ökologische Nachhaltigkeit und sozialer Ausgleich ohne Wettbewerbsfähigkeit und Wachstum überhaupt nicht zu erhalten sind"

Günther Oettinger 2012, Kommissar für Energie der Europäischen Kommission

Wenn das Wachstum stoppt

- Seit der weltweiten Finanz- und Wirtschaftskrise 2008 gehen gehen in Europa gehen die Menschen auf die Straße
- Im Vergleich zu den Vorjahren der Krise gibt es insbesondere in den südlichen Peripherieländern eine Vervielfachung von Demonstrationen
- Insbesondere der Fall Griechenland zeigt, wie ein plötzliches Stoppen des Wirtschaftswachstums zu sozialen Verwerfungen und Unruhen sorgt

Griechenland



Spanien



Trickle-down-economics

- Annahme: Reiche werden reicher ist kein Problem, weil jeder davon profitiert.
- Auch: „Geht’s der Wirtschaft gut, geht’s uns allen gut.“



Zwei Fragen:

1. In welchem Ausmaß sind Ressourcen verfügbar auf dem Planeten Erde?
2. Wieviel kommt wo an?

BAU is not an option

“It is possible that the US and Europe will find that...either continued growth will be too destructive to the environment and they are too dependent on scarce natural resources, or that they would rather use increasing productivity in the form of leisure...There is no reason at all why capitalism could not survive with slow or even no growth.” (Robert **Solow, Nobel Laureate in Economics**)

“Climate change has quite frankly slipped to the back burner of policy priorities. But the problem is not going away – quite the opposite.” (Maria van der Hoeven, **IEA** Executive Director)

“Climate change and its impact on our environment, our economies and our security, is the defining issue of our era. But every day of inaction makes its consequences more irreversible, so we need to act now.” (**OECD** 2008)

“This is the year to take action on climate change. Financial regulators need to lead. Sooner rather than later they must address the systemic risk associated with carbon-intensive activities in their economies... by enforcing disclosure of climate risk and requiring companies and financial institutions to assess their exposure to climate-related impacts” (Jim Yong Kim, **World Bank President**, Jan 2014)

“In 2010, governments confirmed in the Cancun Agreement that emissions should be reduced to avoid a rise in global average temperature of more than 2°C above pre-industrial levels, with the possibility of revising this down to 1.5°C. “

- Carbon Tracker & IEA models: carbon budget for a 2°C scenario would be around 565 – 886 billion tonnes (Gt) of carbon dioxide (CO₂) to 2050
- Total carbon embedded in the world’s indicated fossil fuel reserves: 2,860GtCO₂
- only 20% of total fossil fuel reserves can be burnt to 2050

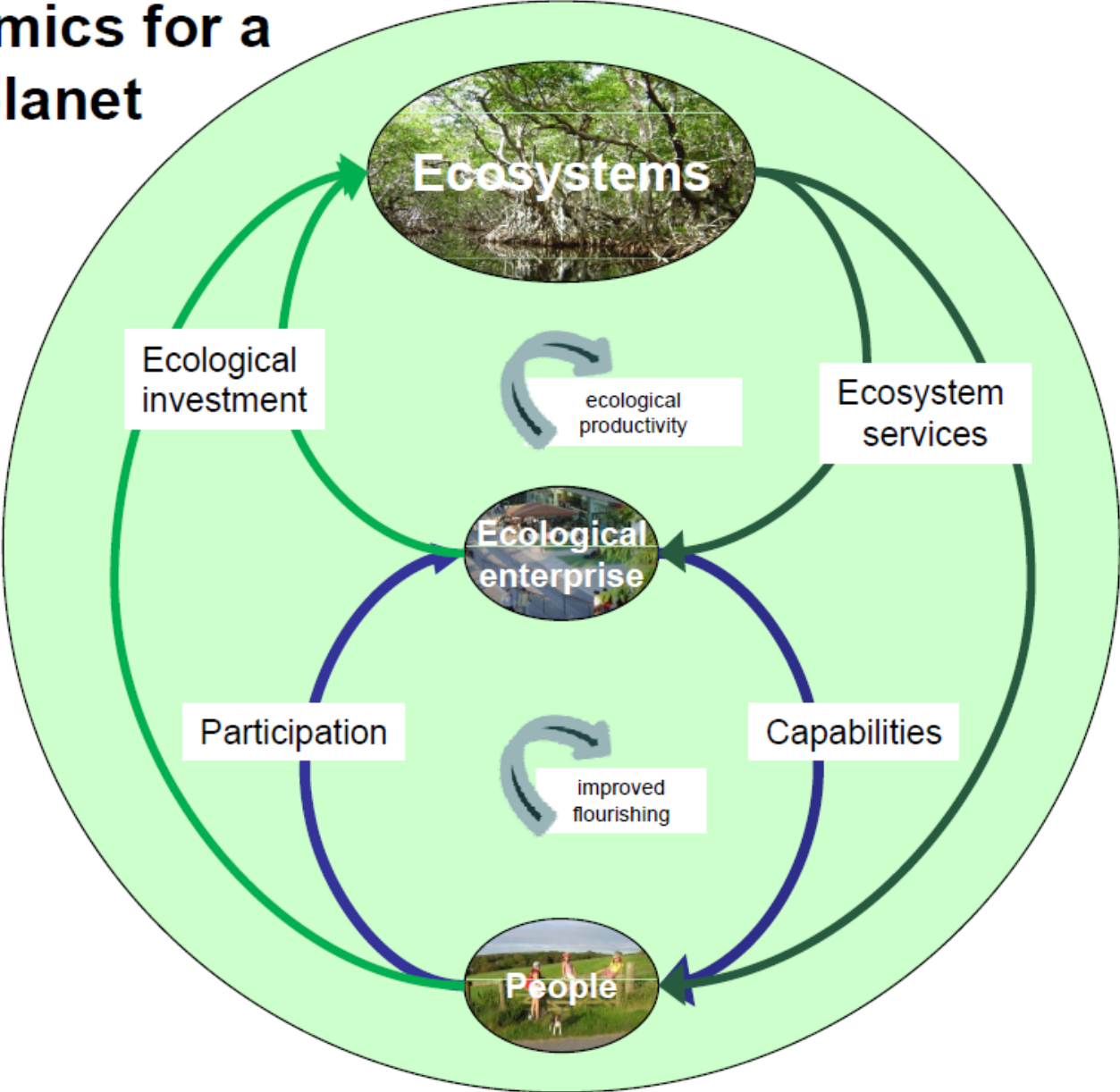


“As a result the global economy already faces the prospect of assets becoming stranded, with the problem only likely to get worse if current investment trends continue - in effect, a carbon bubble.”

Ecosystem services



Economics for a finite planet





What policy makers fear...

“High-carbon growth would kill itself: first from the high prices of hydrocarbons that could result, and second, and more fundamentally, from the very hostile physical environment it would create.”

What policy makers hope for...

... **steady increases in output without adverse environmental consequences.**

+ creation of **jobs** in sectors not covered by statistician's definition of environmental goods and services, such as education, media and business services.

+ greater positive impact in **poorer countries**, where 'green' growth policies with respect to agriculture, forestry and offgrid solar power could raise rural employment and reduce migration to the cities.

+ '**green**' **innovation** in many different industries, including some such as the car industry that are not thought of as particularly 'green'.

What is green growth?

- Despite the widespread use of the term 'green' growth, this is no universally agreed definition, but there is a broad consensus about what it means.
- Economic progress that fosters environmentally sustainable, low-carbon and socially inclusive development.
- It is often treated as a synonym for or an aspect of sustainable development.

Defining Green Growth

OECD:

- Fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies.



Defining Green Growth

World Bank:

- Growth that is efficient in its use of natural resources, clean in that it minimizes pollution and environmental impacts, and resilient in that it accounts for natural hazards and the role of environmental management and natural capital in preventing physical disasters”.
- It adds the rider that “this growth needs to be inclusive”, thus acknowledging the three pillars – economic, environmental and social – of sustainable development.
- “Inclusive green growth is not a new paradigm. Rather, it aims to operationalize sustainable development by reconciling developing countries’ urgent need for rapid growth and poverty alleviation with the need to avoid irreversible and costly environmental damage.

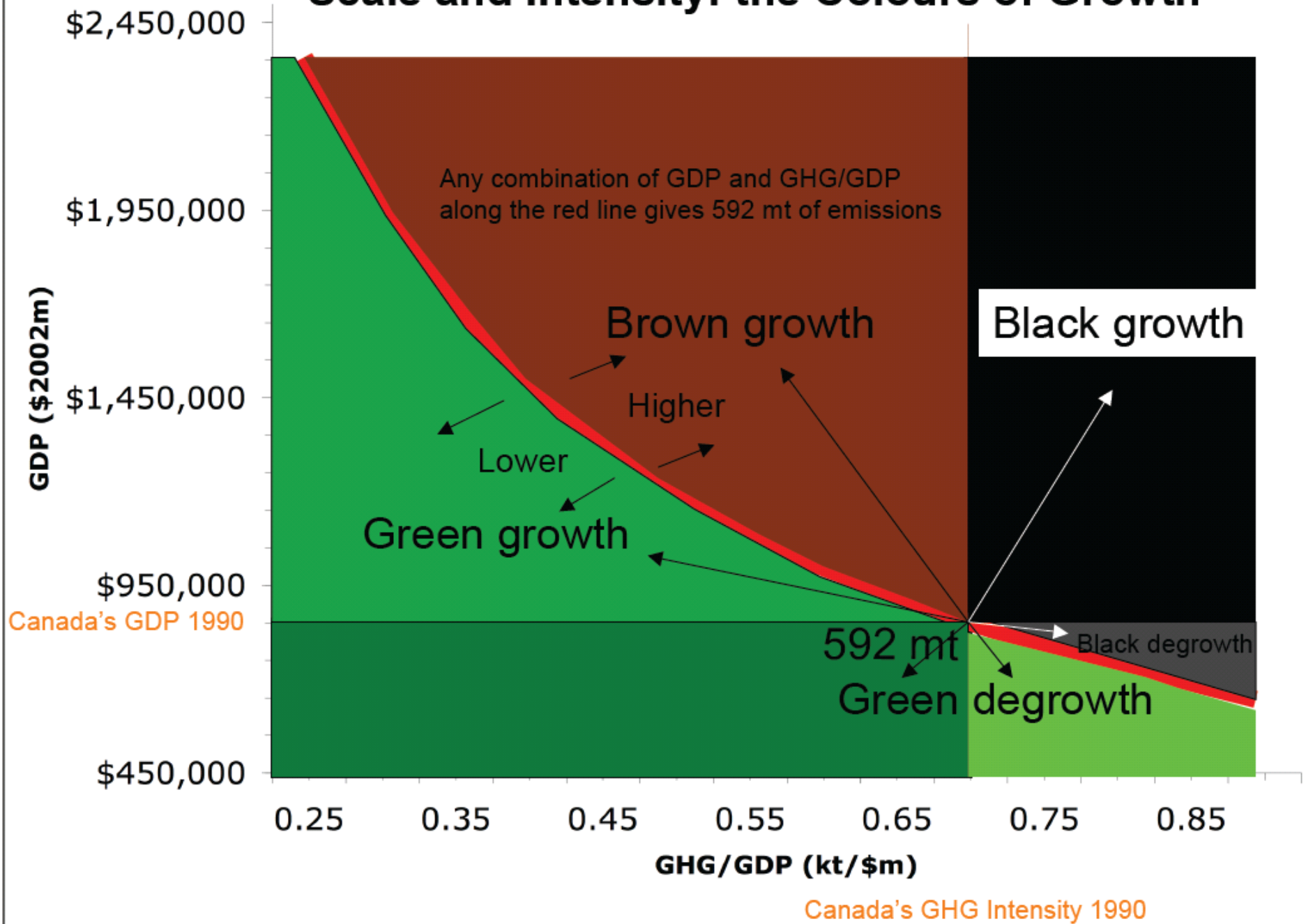
Defining Green Growth

Asian Development Bank:

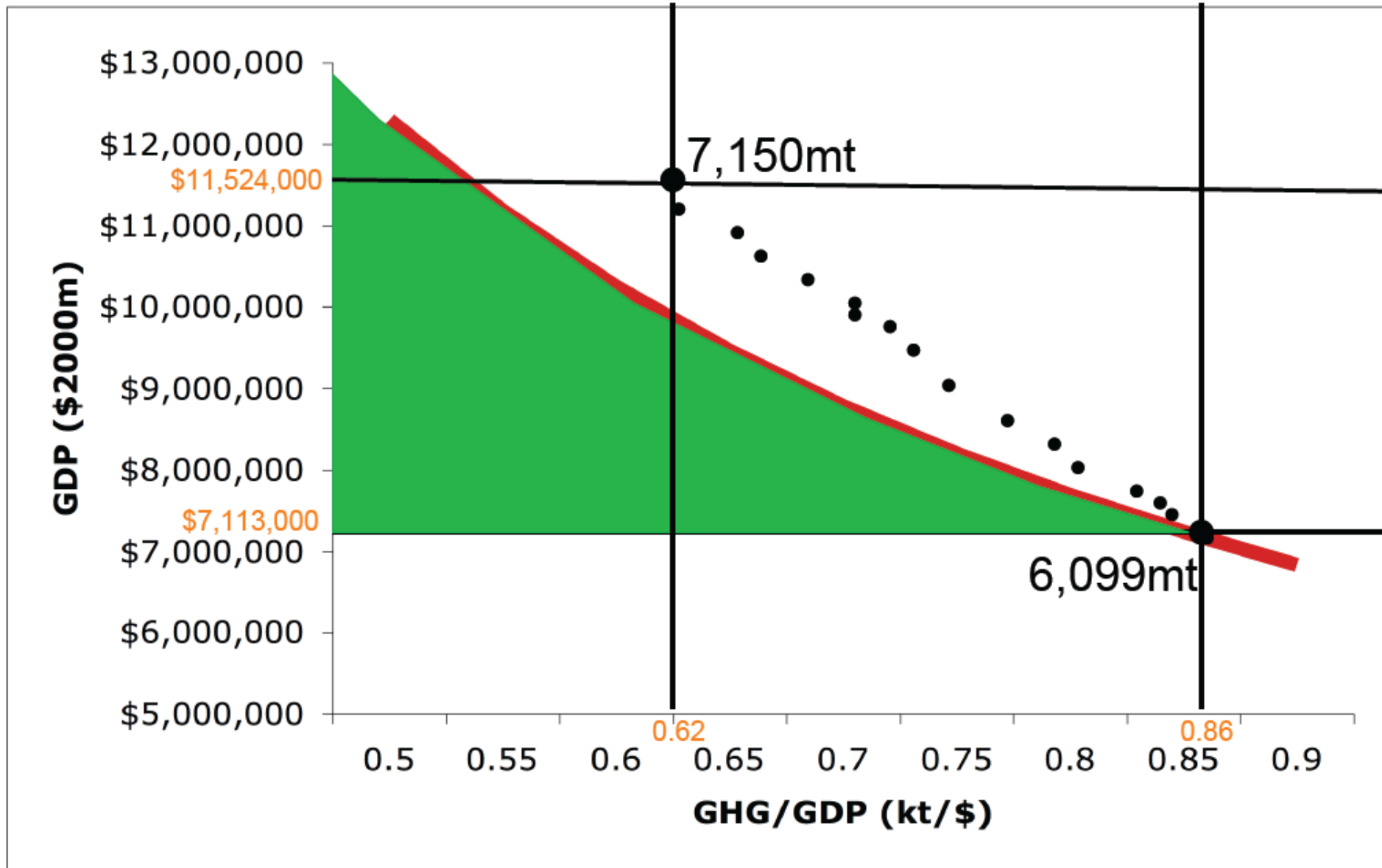
- “Low-carbon green growth is a pattern of development that decouples economic growth from carbon emissions, pollution and resource use, and promotes growth through the creation of new environment friendly products, industries and business models that also improve people’s quality of life”.



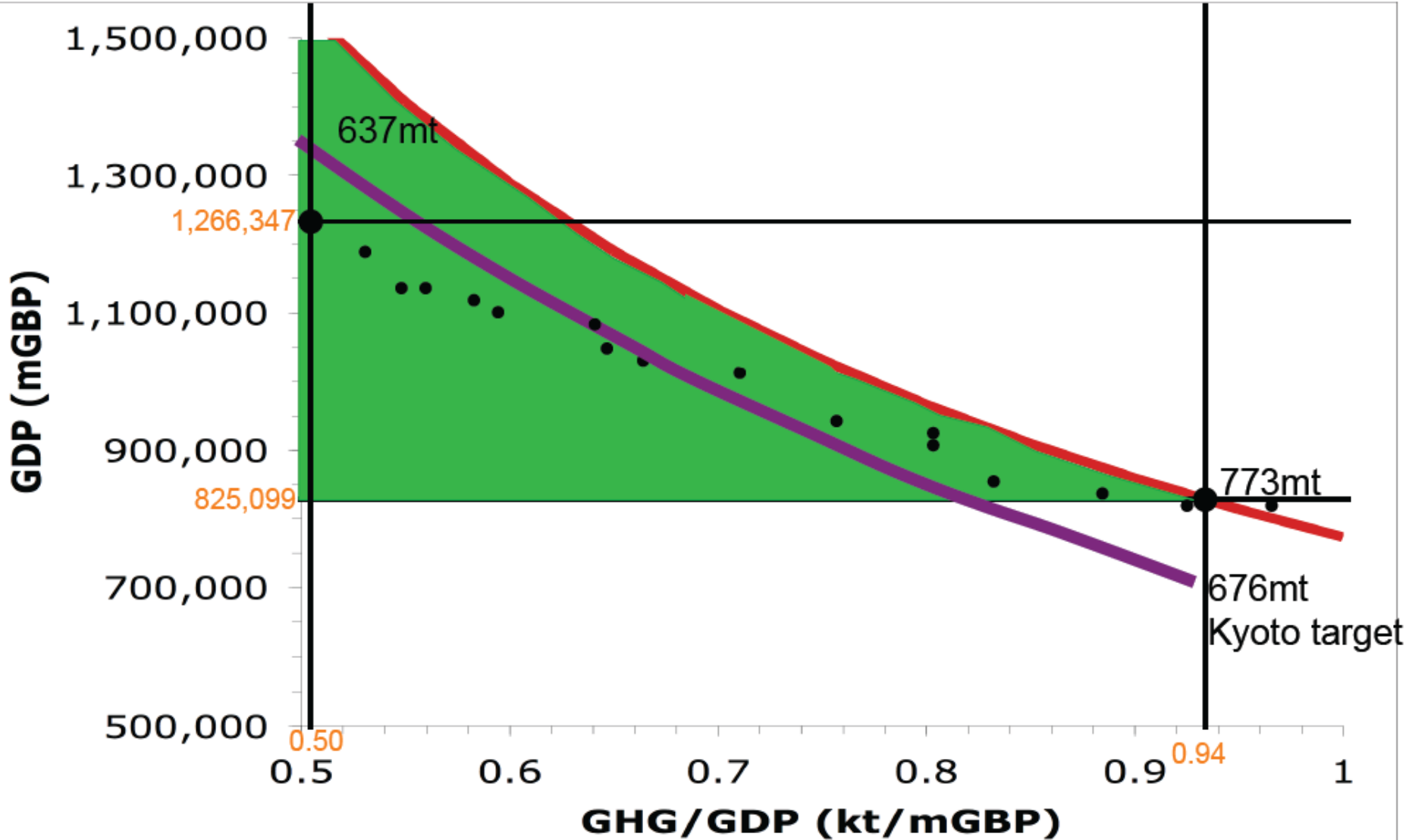
Scale and Intensity: the Colours of Growth



USA's Economic Growth Scale and Intensity 1990-2007



Britain's Economic Growth Scale and Intensity 1990-2007



Limits to Growth model runs

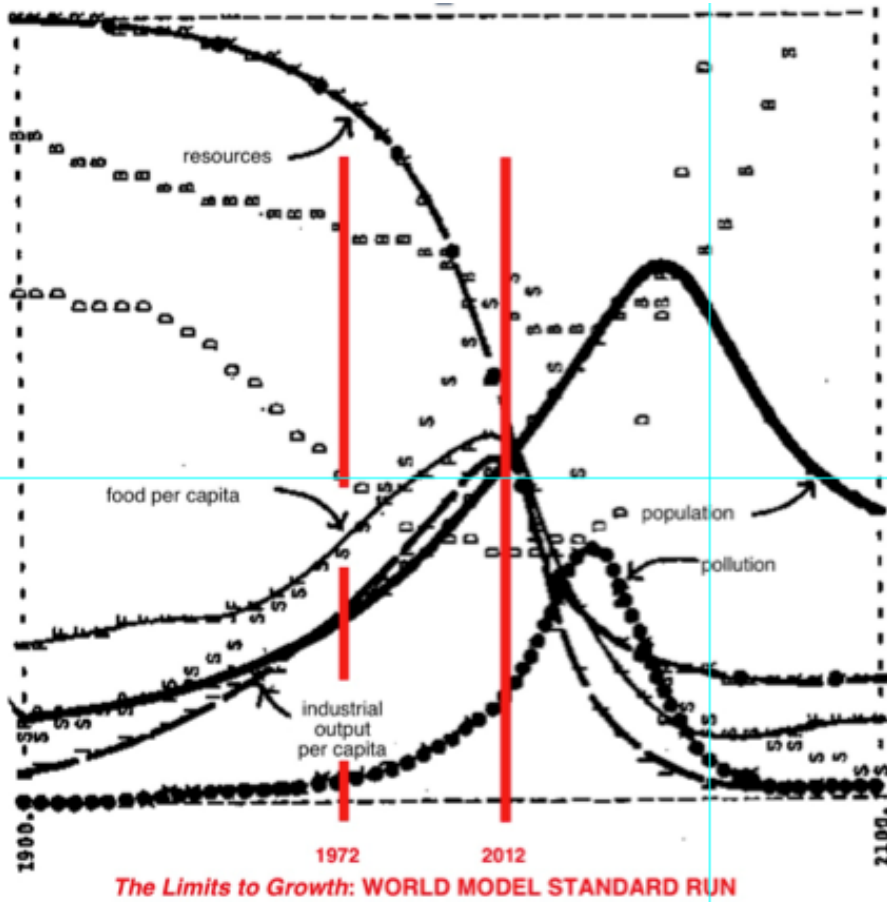


Figure 47 STABILIZED WORLD MODEL II

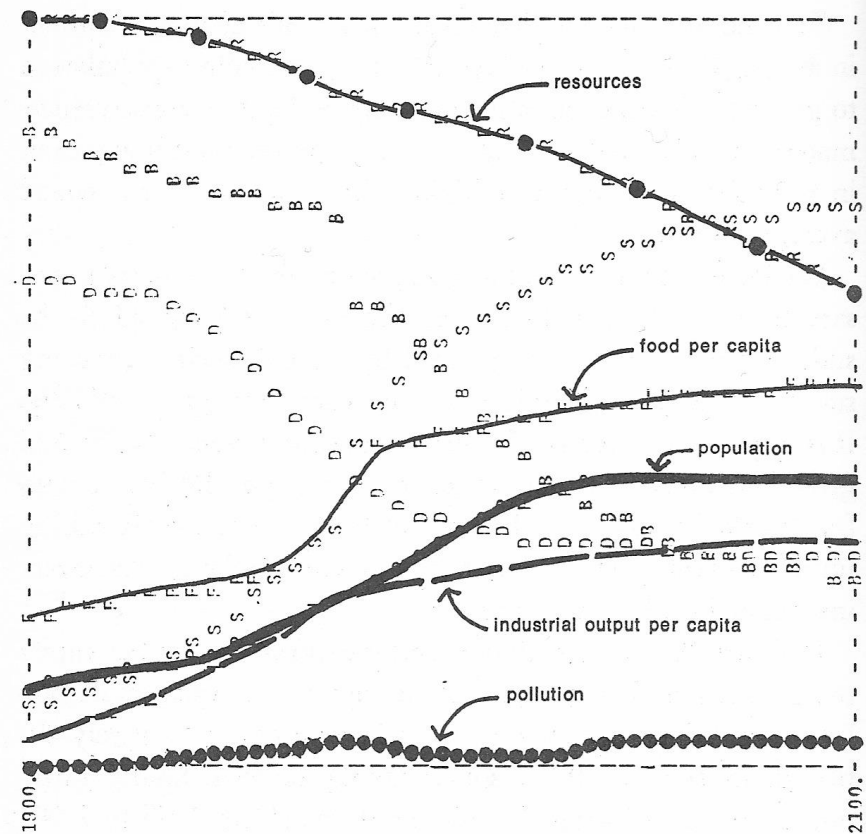
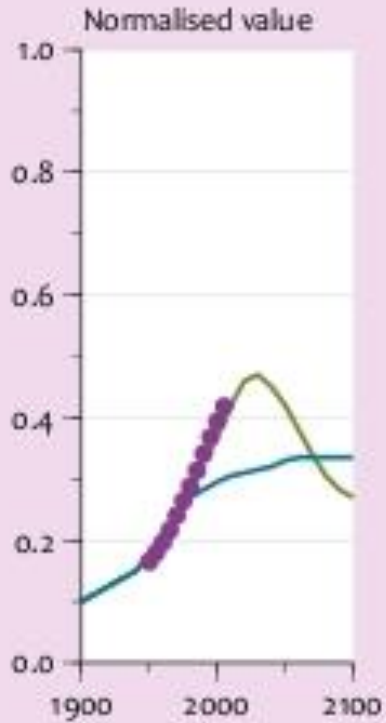


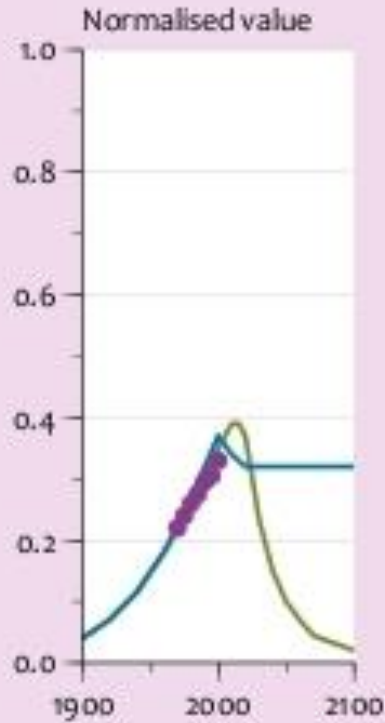
Figure 2.2

Comparing 'Limit to Growth' scenarios to observed global data

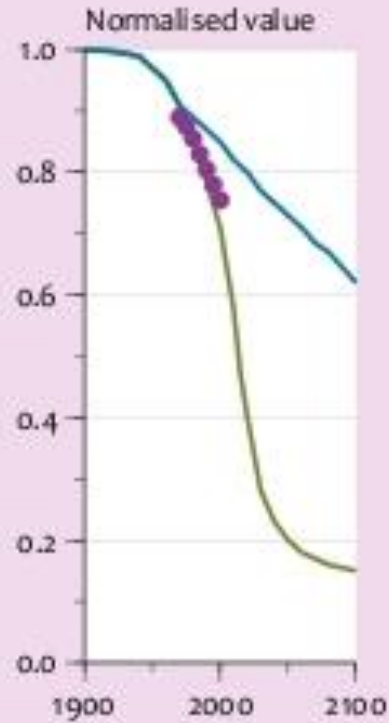
Population



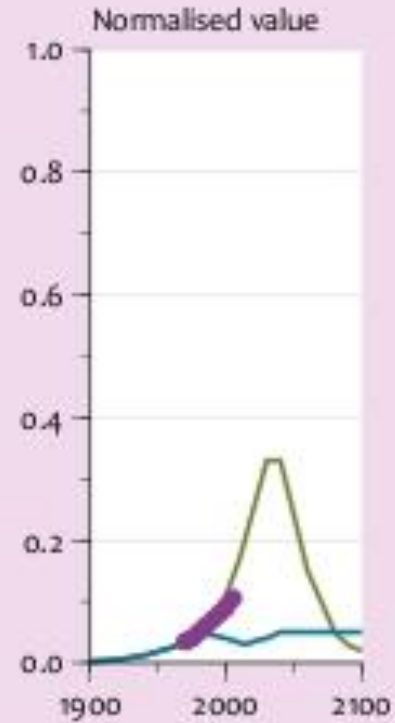
Industrial output



Non-renewable resources



Pollution



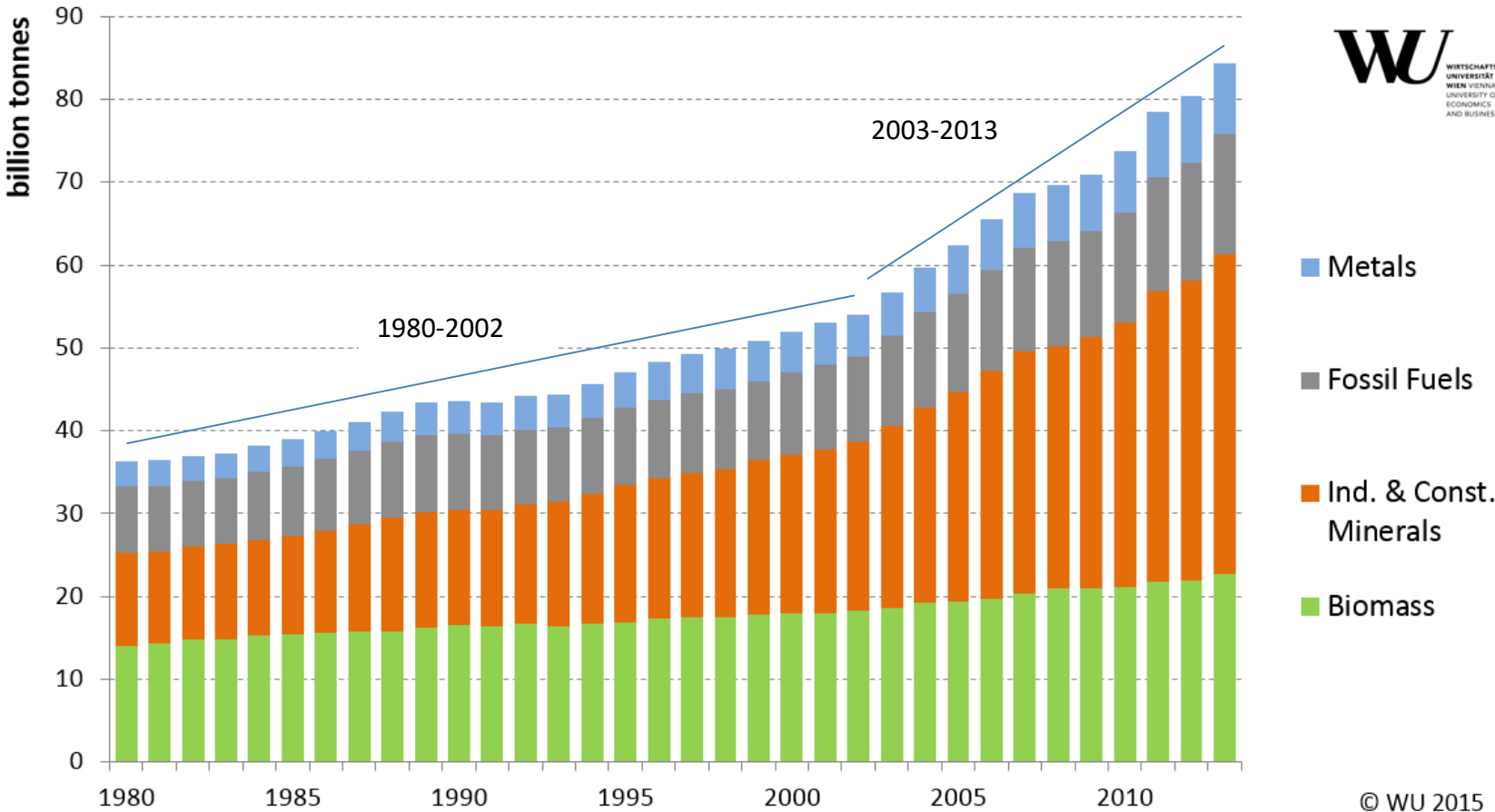
'Limit to Growth' scenarios

— Standard run

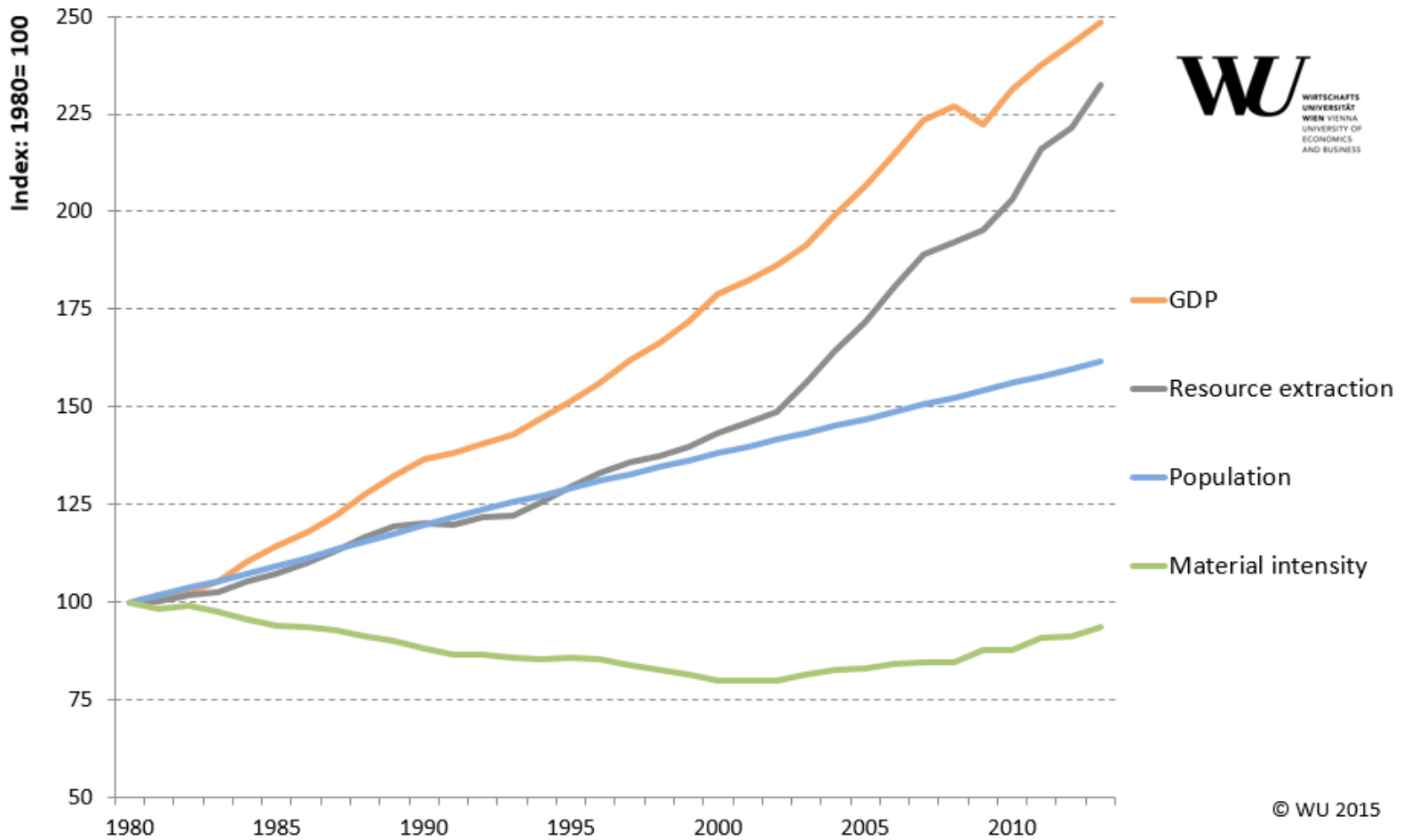
— Stabilized world

● Observed data

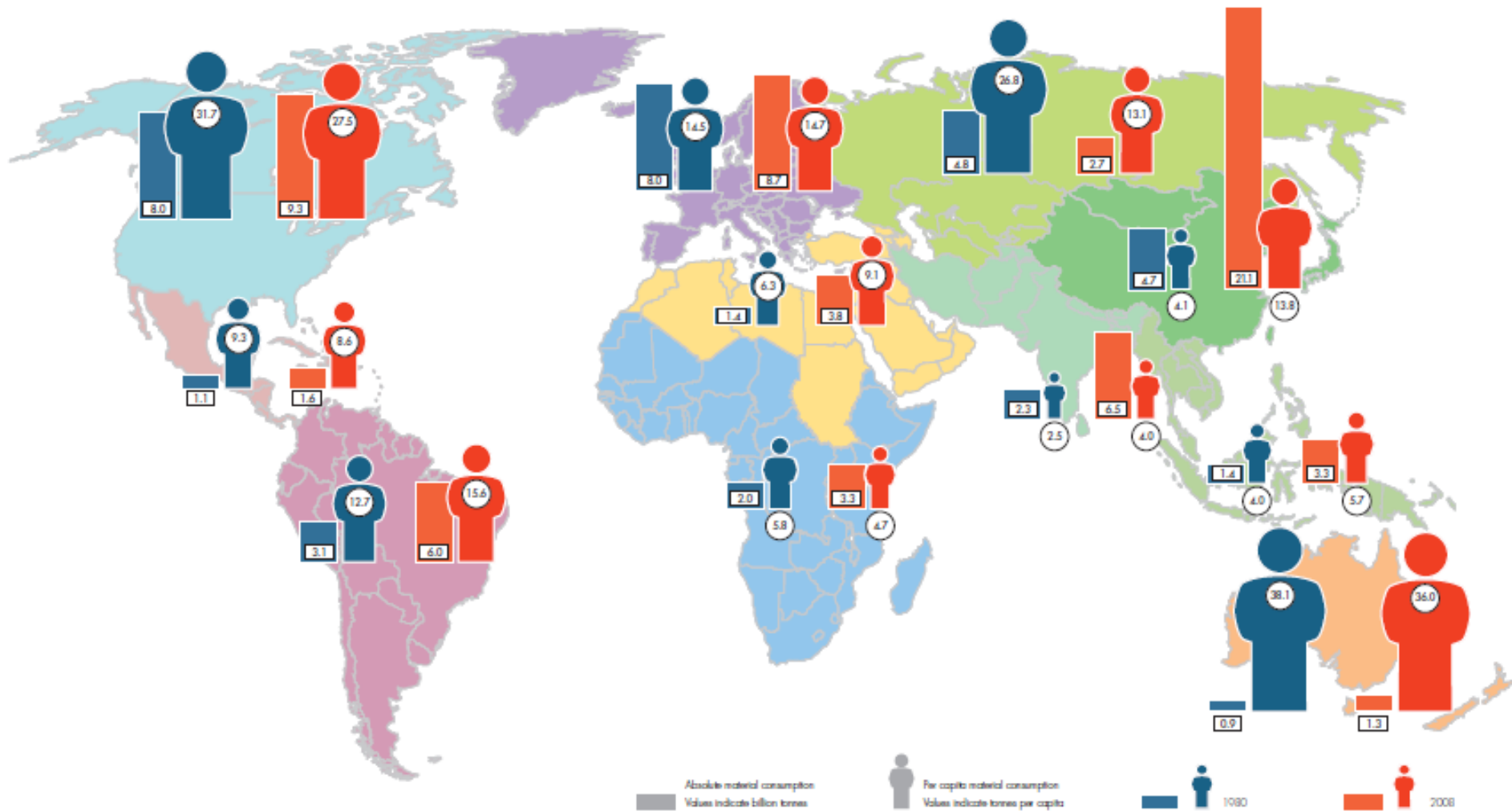
Increasing global resource use



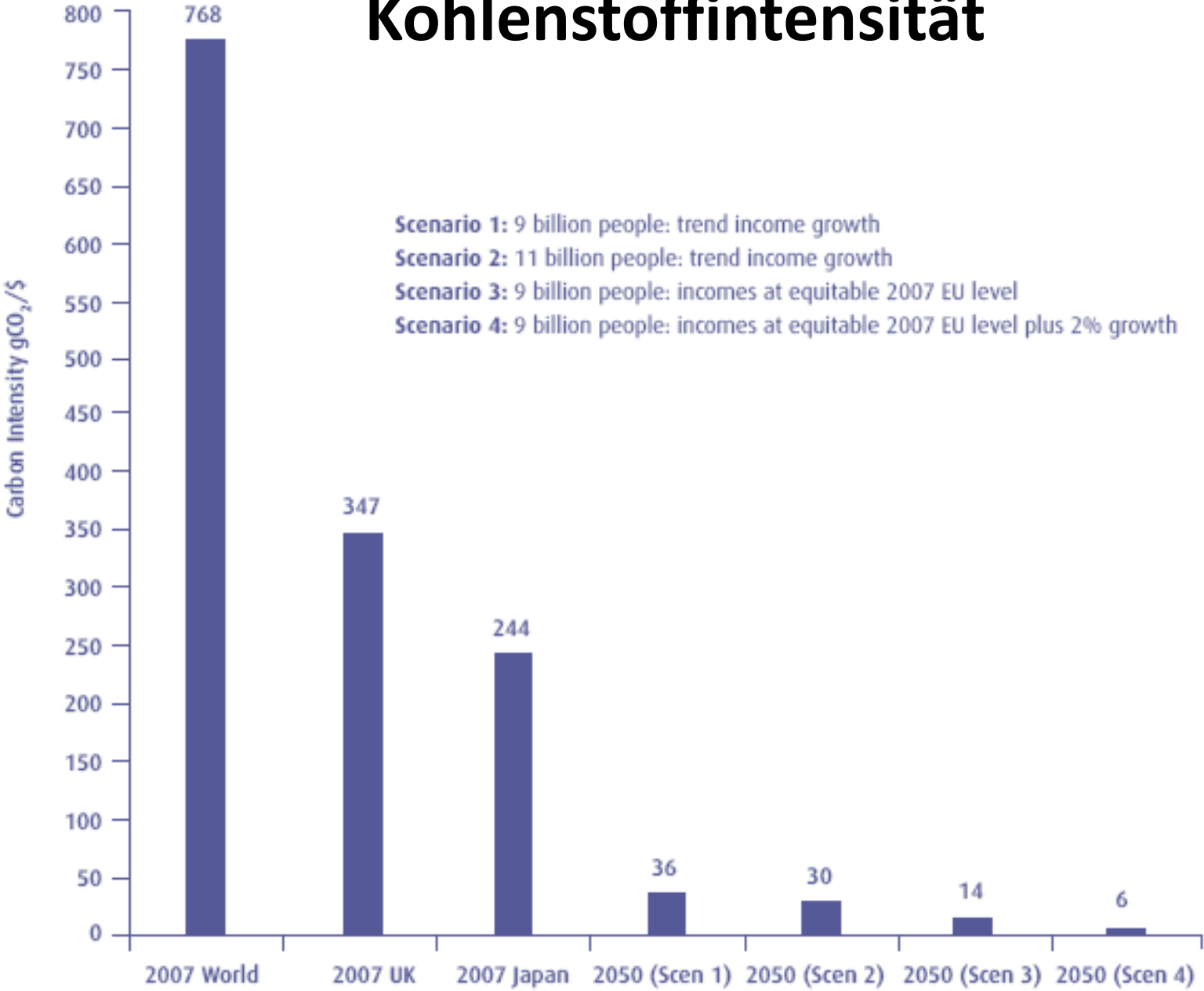
Decoupling on the global scale?



Material consumption by regions in absolute and per capita terms 1980 and 2008



Kohlenstoffintensität



Watch Kevin Anderson giving a presentation on “Paris, climate & surrealism: how numbers reveal another reality”



<https://www.youtube.com/watch?v=jIODRrnHQxg>

Globally



52% of natural gas reserves



35% of oil reserves

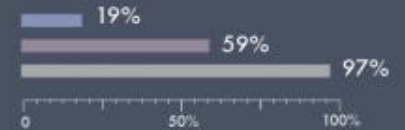


88% of coal reserves

Europe



Former Soviet Union countries



How much oil, gas and coal will we have to leave in the ground to stay under 2 degrees of warming?

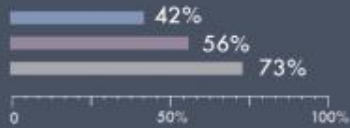
Canada



US



Central and South America



Africa



Middle East



China and India



Other developing Asian countries



OECD Pacific



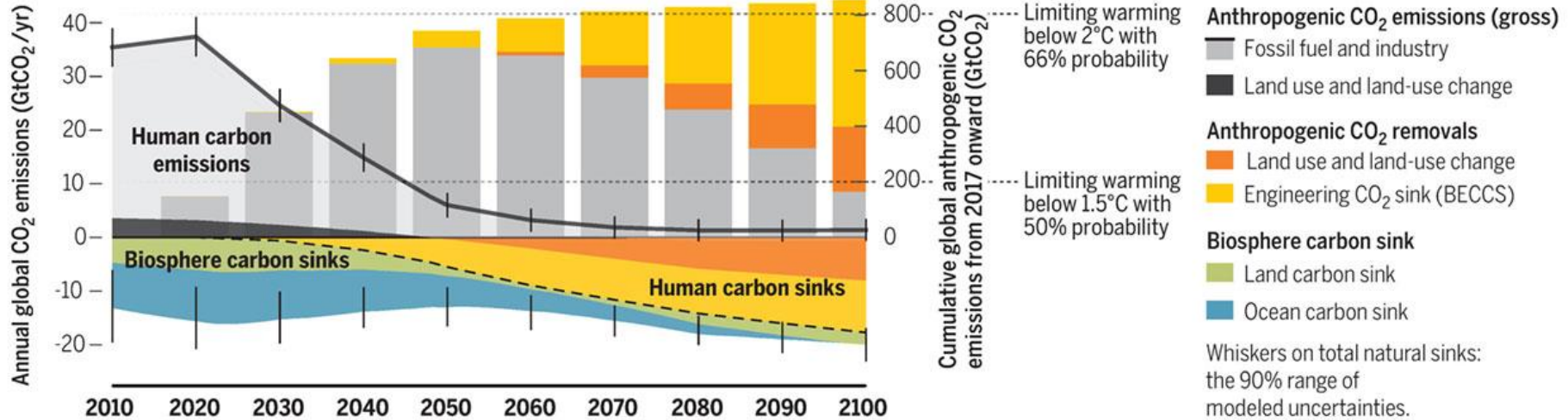
Rockström, Gaffney, Rogelj, Meinshausen, Nakicenovic, and Schellnhuber. 2017. "A roadmap for rapid decarbonization." Science 355 (6331):1269-71.



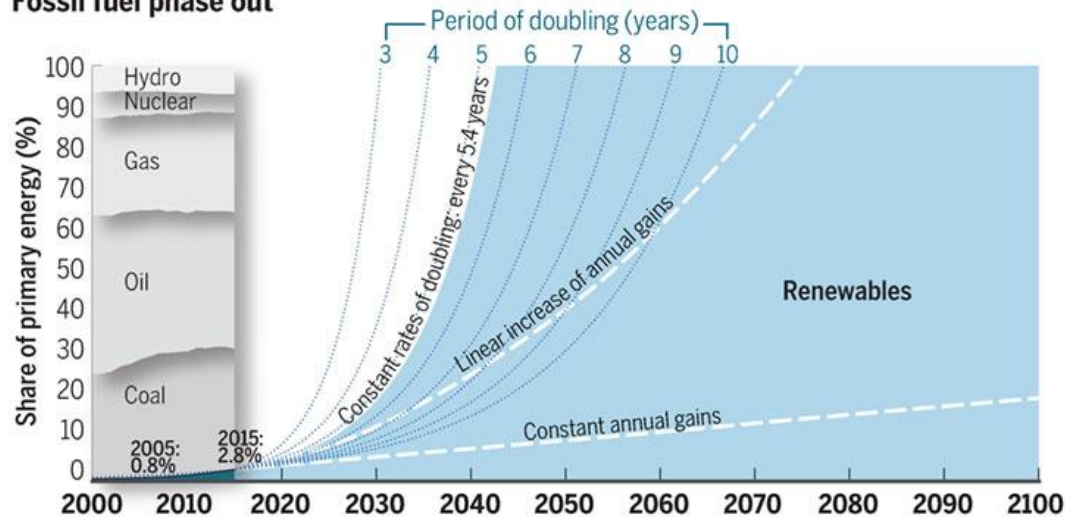
<https://www.youtube.com/watch?v=UZ5nKGHMWC0>

A global carbon law and roadmap to make Paris goals a reality

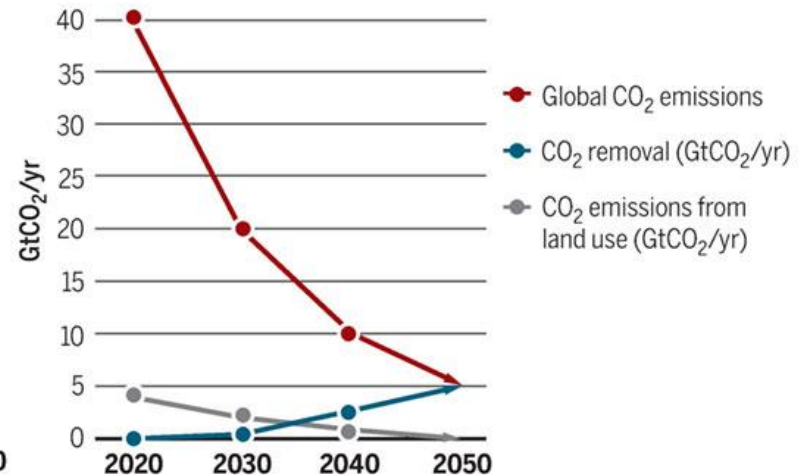
Decarbonization pathway consistent with the Paris agreement



Fossil fuel phase out



Global carbon law guiding decadal pathways



- **(Top)** A deep decarbonization scenario scientifically consistent with the Paris Agreement (3) and its associated carbon fluxes as computed with a simple carbon cycle and climate model. The “carbon law” scenario of halving emissions every decade is marginally more ambitious than the scenario presented. Meeting the Paris Agreement goals will require bending the global curve of CO₂ emissions by 2020 and reaching net-zero emissions by 2050. It furthermore depends on rising anthropogenic carbon sinks, from bioenergy carbon capture and storage (BECCS) engineering (yellow) and land use (orange), as well as sustained natural sinks, to stabilize global temperatures. This scenario is broadly consistent with a 75% probability of limiting warming to below 2°C; a median temperature increase of 1.5°C by 2100; estimated peak median temperature increase of 1.7°C; a 50% probability of limiting warming to below 1.5°C by 2100; and CO₂ concentrations of 380 ppm in 2100.
- **(Bottom left)** Nonlinear renewable energy expansion trajectories based on 2005–2015 global trends. Keeping the historical doubling times of around 5.5 years constant in the next three decades would yield full decarbonization (blue area) in the entire energy sector by ~2040, with coal use ending around 2030–2035 and oil use, 2040–2045.
- **(Bottom right)** Decadal staircase following a global carbon law of halving emissions every decade, a complementary fall in land-use emissions, plus ramping up CO₂ removal technologies.

2017–2020: NO-BRAINERS

- Annual emissions from fossil fuels must start falling by 2020. Well-proven (and ideally income-neutral) policy instruments such as carbon tax schemes, cap-and-trade systems, feed-in tariffs, and quota approaches should roll out at wide scale.
- Even these will be challenging in the emerging global political climate.
- The European Union emissions-trading scheme requires kick-starting through an appropriate floor price ($> \$50/\text{metric ton CO}_2$).

2020-2030: HERCULEAN EFFORTS

- Economies must implement the no-brainer mitigation measures plus the first wave of smart and disruptive action.
- Improving energy efficiency alone would reduce emissions 40 to 50% by around 2030 in many domestic and industrial cases

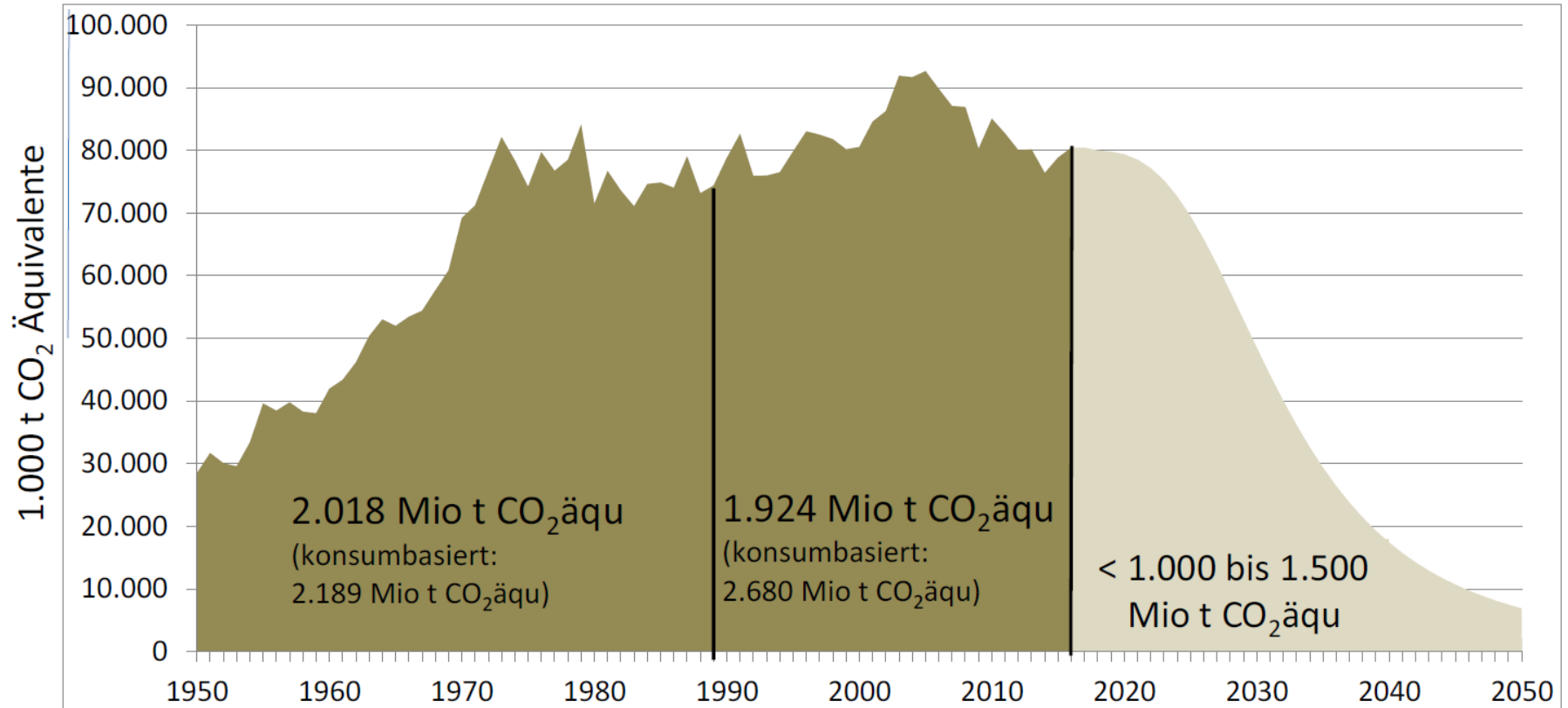
2030-2040: MANY BREAKTHROUGHS

- By 2040, oil will be about to exit the global energy mix.
- Several vanguard countries (such as Norway, Denmark, and Sweden) should have completed electrification of all sectors and be entirely emissions-free or close to it.
- Internal combustion engines for personal transport will have become rare on roads worldwide.
- Aircraft fuel should be entirely carbon neutral. Synthesized fuels, bio-methane, and hydrogen are established alternatives.
- After 2030, all building construction must be carbon-neutral or carbon-negative.
- Promising financial mechanisms to foster investments in necessary breakthroughs include sovereign wealth funds designed for transformation; effective international corporation tax regimes (11); and inheritance reforms that account for historical wealth generated by fossil fuels without compensation of externalities (12).

2040-2050: REVISE, REINFORCE

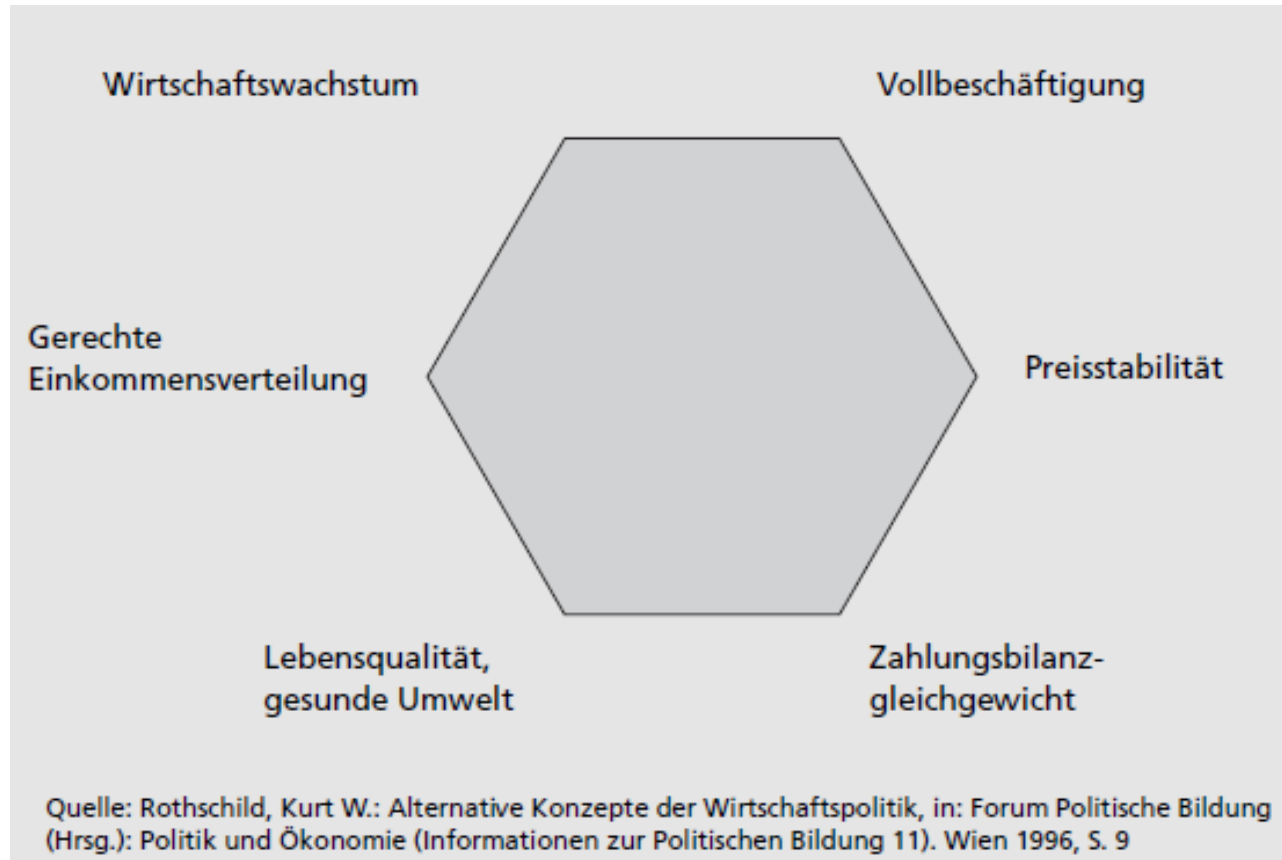
- Building on successes and learning from failures of previous stages, certain mitigation strategies will be abandoned and others refined and amplified.
- All major European countries become close to net-zero carbon states early in the 2040s; market dynamics push North and South America and most of Asia and Africa to this goal by the end of the decade. Natural gas still provides some backup energy, but CCS ensures its carbon footprint is limited.
- Modular nuclear reactors may contribute to the energy mix in places.

Kohlenstoffbudget für Österreich



Source: [Meyer, Steininger 2017 Das Treibhausgas-Budget für Österreich](#)

Vom magischen Vieleck der Wirtschaftspolitik zum Wachstumsparadigma





SUSTAINABLE DEVELOPMENT GOALS



“Climate change, demographics, water, food, energy, global health, women's empowerment - these issues are all intertwined. We cannot look at one strand in isolation. Instead, we must examine how these strands are woven together.”

UN Secretary-General, Ban Ki Moon, at COP 17 (Ban, 2011)

Der schwierige Übergang vom Wachstumsparadigma zu Zukunftsfähigem Wirtschaften

- Problem:
 - Absolute Entkopplung von Wirtschaftswachstum und Materialverbrauch ist bisher noch nicht gelungen (mehr in nächste LV)
 - Bisher wurden Sozialsysteme und andere Gesellschaftspolitische Aufgaben jedoch hauptsächlich durch Wirtschaftswachstum stabilisiert
 - Wachstum \neq Wohlstand
- Lösung:
 - „Slower by design not by disaster“ (Peter Victor)

Jackson, Wohlstand ohne Wachstum

- Eine Lösung wäre Wohlstand nicht in Verbindung mit Einkommen und Vermögen bringen, sondern mit Amartya Sen's ‚Capabilities‘:
- Fähigkeiten zum Gedeihen:
 - ausreichende und gesunde Ernährung
 - Lebenserwartung
 - Gesellschaftliche Teilhabe
- **Befähigungen zu handeln** und die **Freiheit dazu zu haben**
- Impliziert einen starken und vor allem ausgedehnten moralischen Diskurs, da es wichtig ist es **die Grenzen mitzudenken**.

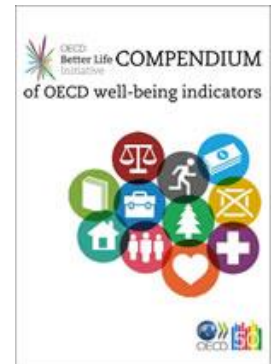
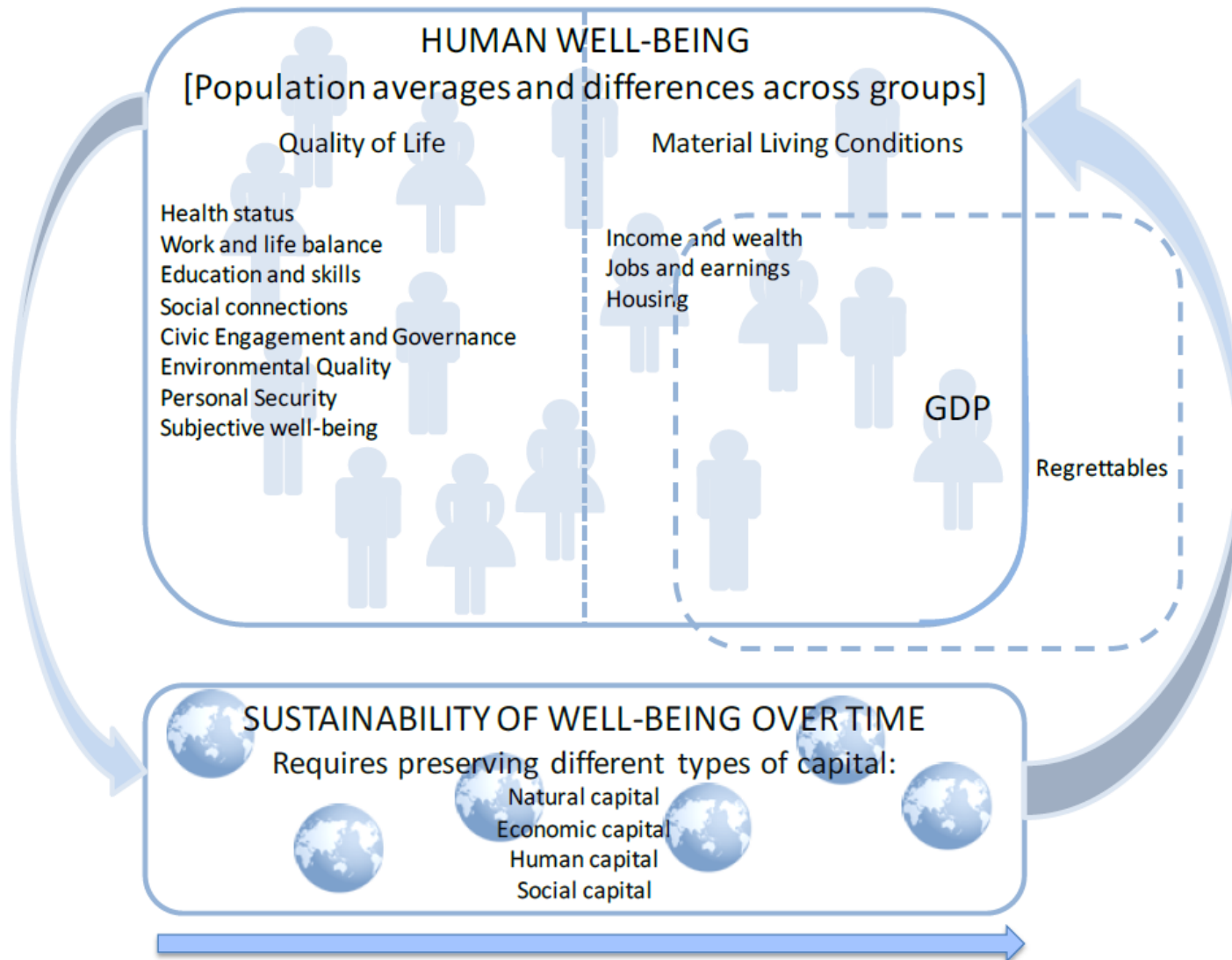
Messung von Wohlstand

Kommission zur Messung von ökonomischer Aktivität und sozialen Fortschritt (“Stiglitz Kommission”) www.stiglitz-sen-fitoussi.fr

- Joseph E. Stiglitz, Amartya Sen, Jean-Paul Fitoussi
- ‘Mis-measuring our lives: Why GDP doesn’t add up’ (2010)
- u.a. erstellen von ‘social welfare matrix’, ‘social accounting’, etc.



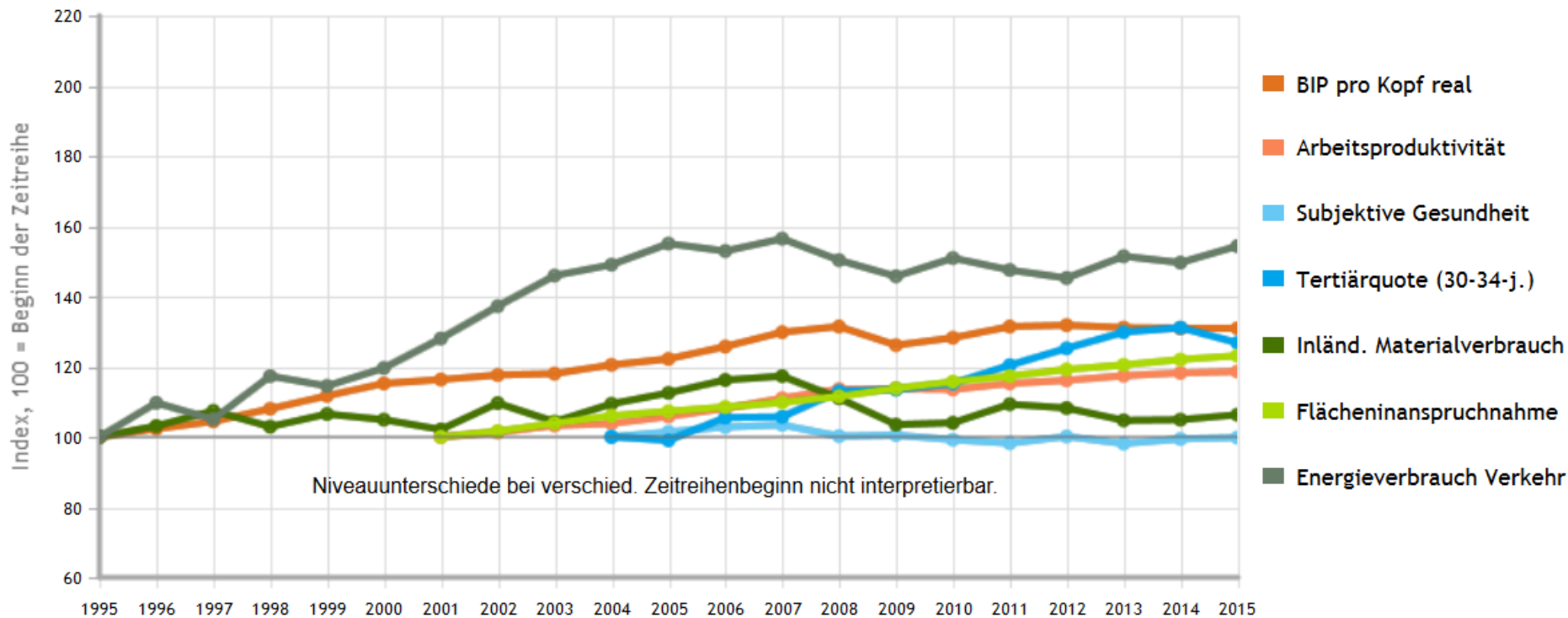
'Compendium of OECD well-being indicators



Wohlbefinden in Österreich – welche Komponenten? welcher Verlauf?



Wie geht's Österreich



Quelle: Statistik Austria

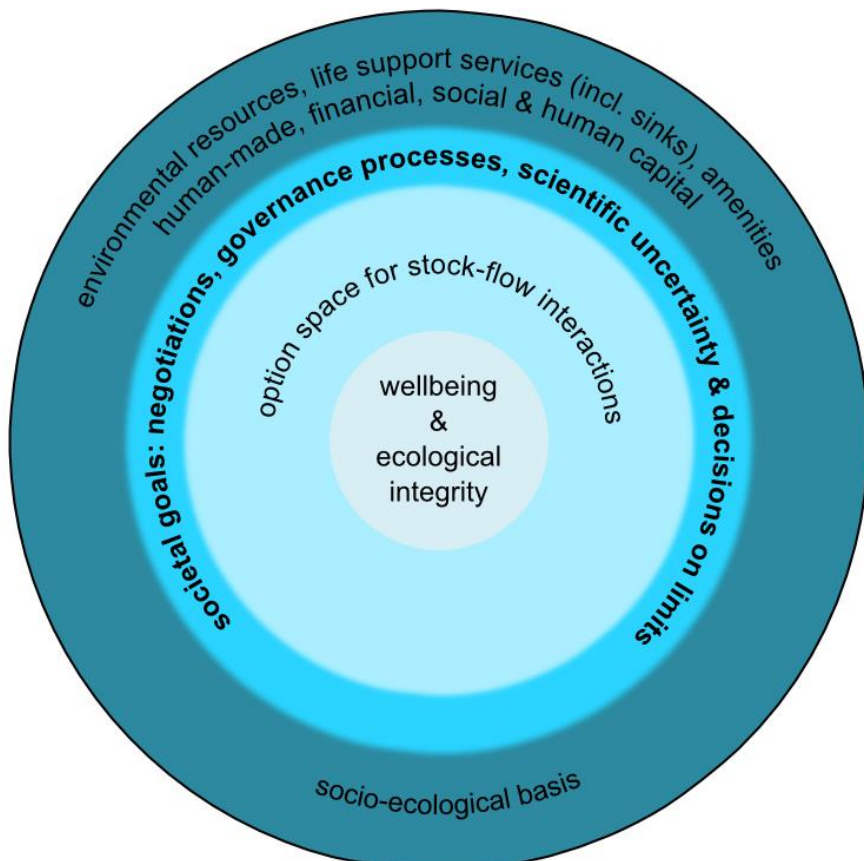
Menschliches Handeln verändern ist wichtig, aber auch neue institutionelle Settings

- Innovation im Sinne Schumpeters nicht nur auf technologischer/industrieller, sondern vor allem auch auf sozialer und ökologischer Ebene thematisieren
- Die soziale Teilhabe, welche traditionellerweise mit Arbeit assoziiert ist, anders ermöglichen
- Ungleichheit abbauen indem soziale Sicherungssysteme gestärkt werden

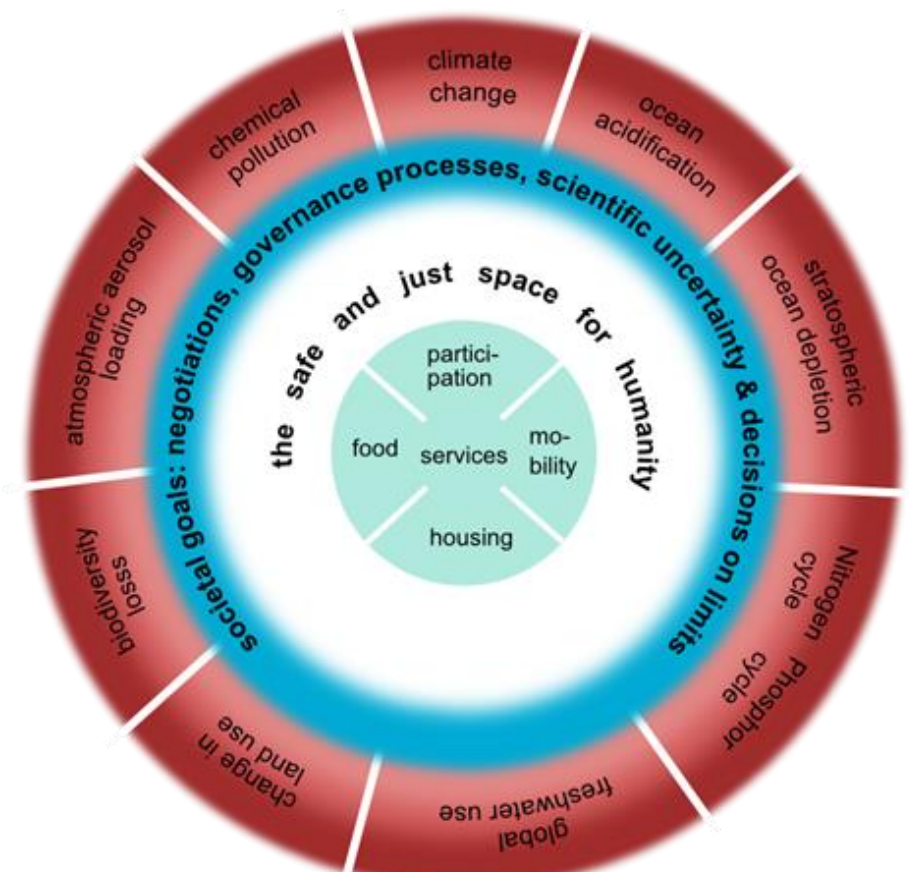
From the socio-ecological basis to wellbeing and ecological integrity

We propose an integrated framework that can be looked at from an input or output perspective:

Input perspective



Output perspective



Some conclusions

- ‘Green’ growth has become a familiar buzz word among economic policy-makers in rich and poor countries alike.
- In contrast to sustainable development which is more open to what the developmental goals are, green emphasizes growth and mitigating climate change, which is widely perceived as key long-term challenge to sustainability.
- The challenge is to make more of it than just spin.
- A differentiated growth strategy which gives headroom to poor nations / households within a **socio-ecological transformation** that respects biophysical limits, reduces inequality and increases human wellbeing for all, is a more comprehensive approach.

Many thanks for your attention!

I look forward to your input and questions.

Prof. Dr. Sigrid Stagl

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wu.ac.at/ecolecon

wu.ac.at/sozoek

wu.ac.at/ineq/

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MSc Socio-Ecological Economics and Policy

wu.ac.at/master/en/seep

AT A GLANCE

Duration	Four semesters, full-time degree program
Credits	120 ECTS credits (incl. 20 ECTS credits for the master thesis)
Degree awarded to graduates	Master of Science (WU)
Start	New in winter semester 2012/13
Capacity	Up to 60 students per academic year
Application	Rolling admission starts in October 2012 (more information on page 11)
Contact	seep@wu.ac.at

The main elements of the SEEP curriculum are:

- › a conceptual framework for understanding global economic, environmental and social change,
- › sophisticated skills in socio-economic analysis, and qualitative as well as quantitative methods,
- › concentration areas in
 - › Environmental Change and Policy
 - › Population, Human Capital and Policy
 - › Globalization and Multi-Level Policy, and
 - › Globalization and Social Policy,
- › an ability to apply skills and expertise to difficult and complex "real world" problems.

FIRST YEAR

At the beginning, students study global challenges and socio-economic theories in detail and the foundation of methods is acquired. They get familiar with the two chosen concentration areas.

SECOND YEAR

Students advance quickly to specialized expertise and real-world applications. In this phase, the main courses will be in the concentration areas and students will explore their interdependencies. Students develop and hone their research skills through course work and writing a thesis. Students have the opportunity to spend one of the four semesters abroad (subject to approval).