



INDUSTRIAL EFFICIENCY 2018 BERLIN
LEADING THE LOW-CARBON TRANSITION
DIE KALKSCHEUNE 11-13 JUNE

National co-organiser:



DENEFF

DEUTSCHE
UNTERNEHMENSINITIATIVE
ENERGIEEFFIZIENZ

Closing Plenary

Broadening the Scope Beyond Efficiency

Come On. The Club of Rome is back in the arena

Prof. Ernst Ulrich von Weizsäcker

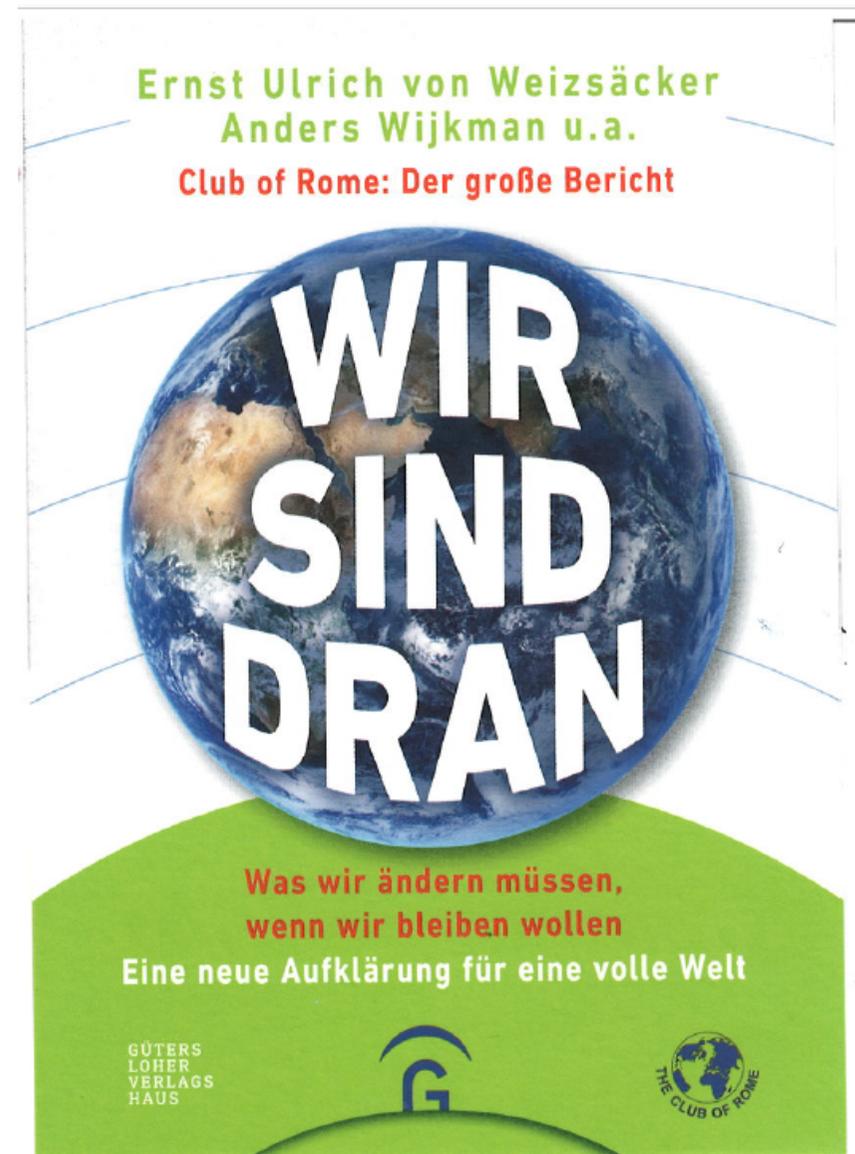
Past Co-Chair



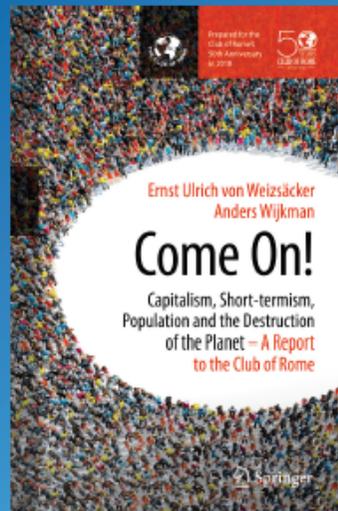
Co-President



The Club of Rome got famous for „The Limits to Growth“ in 1972. The message is still correct, but we had to dramatically update it. With Come On!



Smashing new report from
the Club of Rome



Published 2018

Come On!

Capitalism, Short-termism, Population
and the Destruction of the Planet

By E. von Weizsaecker and Anders Wijkman

Featuring the following chapters:

- C'mon! Don't Tell Me the Current Trends Are Sustainable!
- C'mon! Don't Stick to Outdated Philosophies!
- Come On! Join Us on an Exciting Journey Towards a Sustainable World!

eBook
available



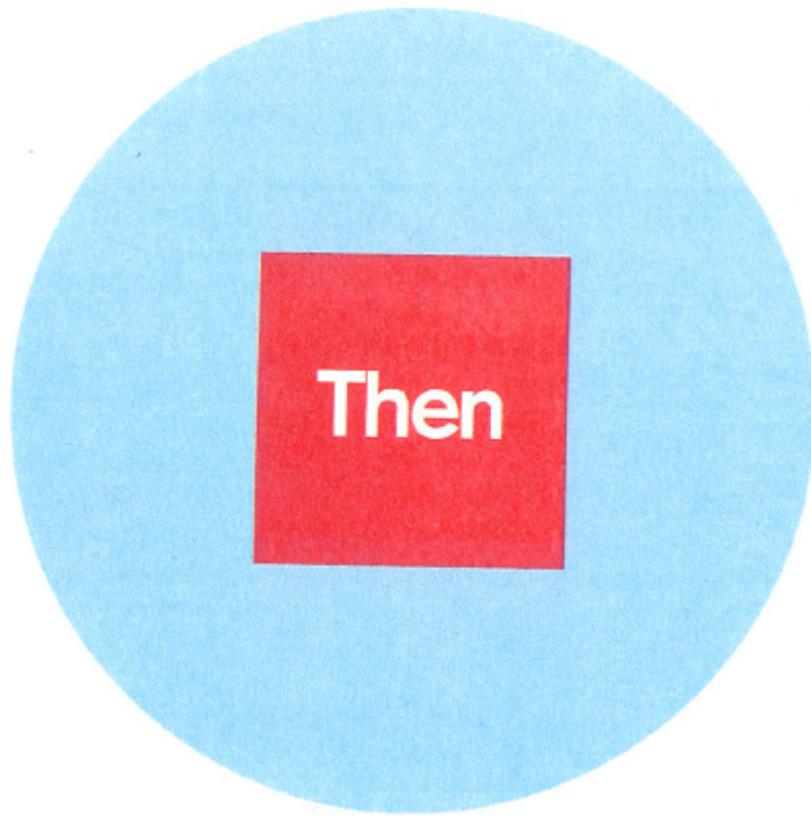
The UN 2030 Agenda of 17 Sustainable Development Goals including affordable and clean energy (SDG 7)



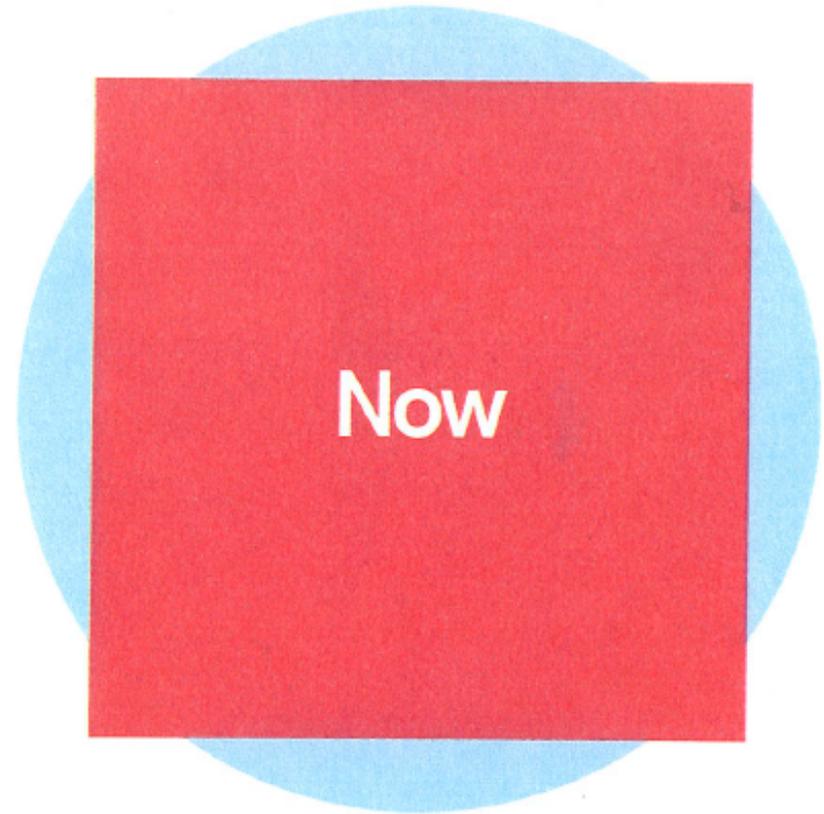
Trouble is that if the first 11 SDG's are reached, goals 13,14,15 are broken

Growth economics was ok for the *Empty World*. But it can be wrong for the Full World. (Herman Daly)

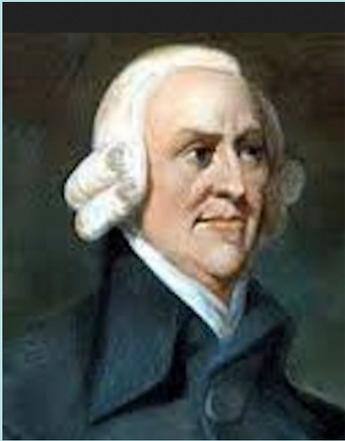
Empty World



Full World



Human centered development resulted from the Enlightenment of the 17-18 Century



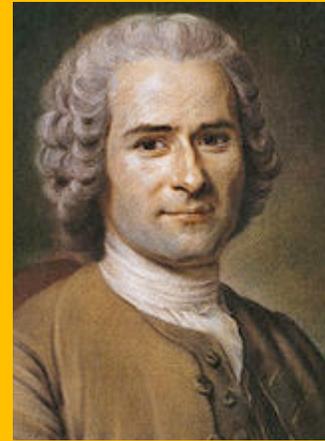
Adam Smith

Selfish Motivation



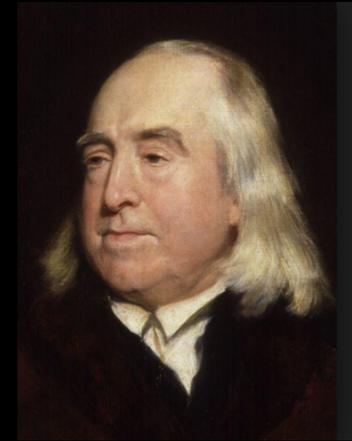
Immanuel Kant

Pure reason



Jean Jacques Rousseau

Social Contract



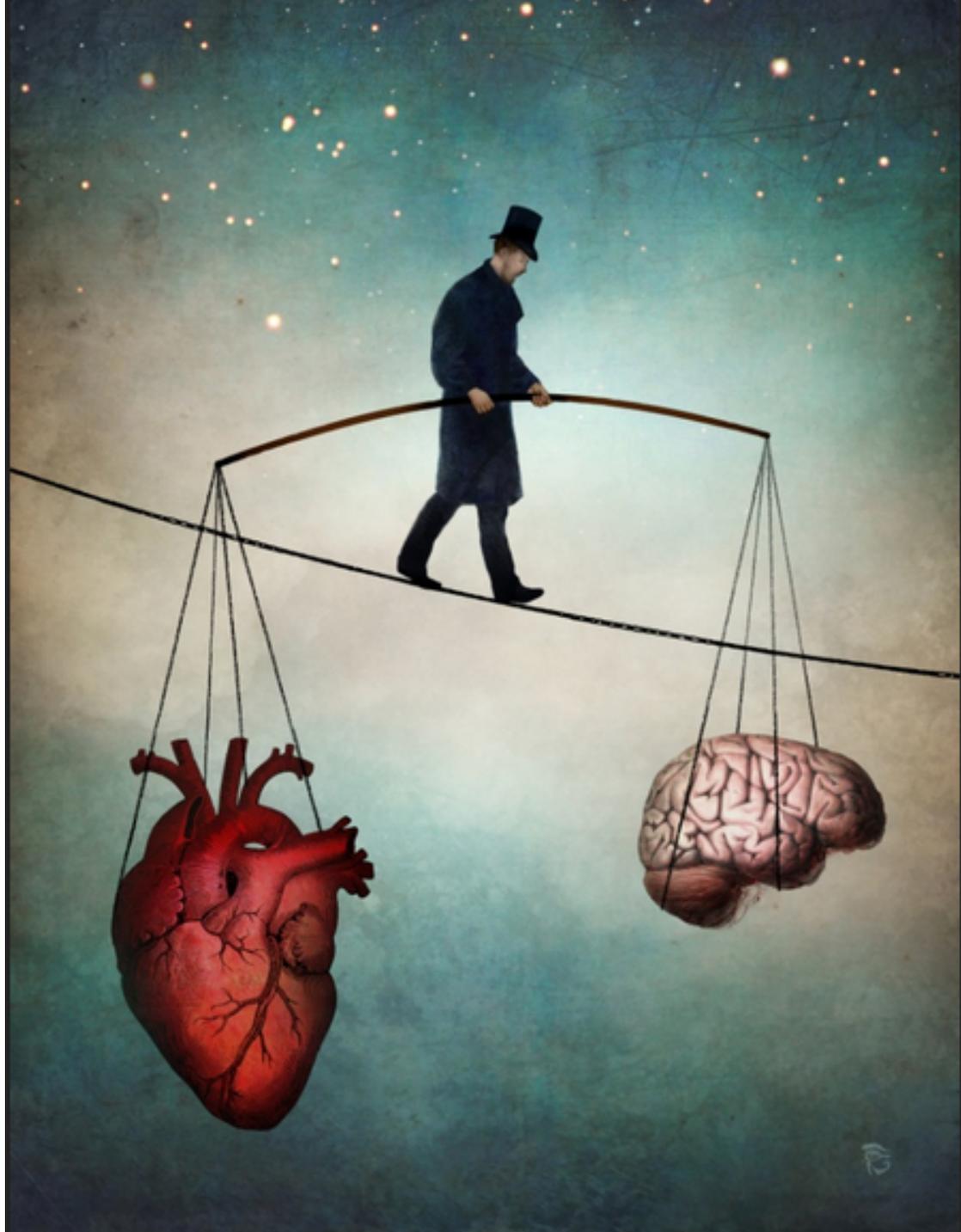
Jeremy Bentham

Utilitarianism

**Responding to the „Philosophical crisis“,
we suggest to engage in a
New Enlightenment, or**

Enlightenment 2.0,

the enlightenment fitting for the Full World



Balance
is at the core
of the
New Enlightenment!

Balance where?

e.g. between

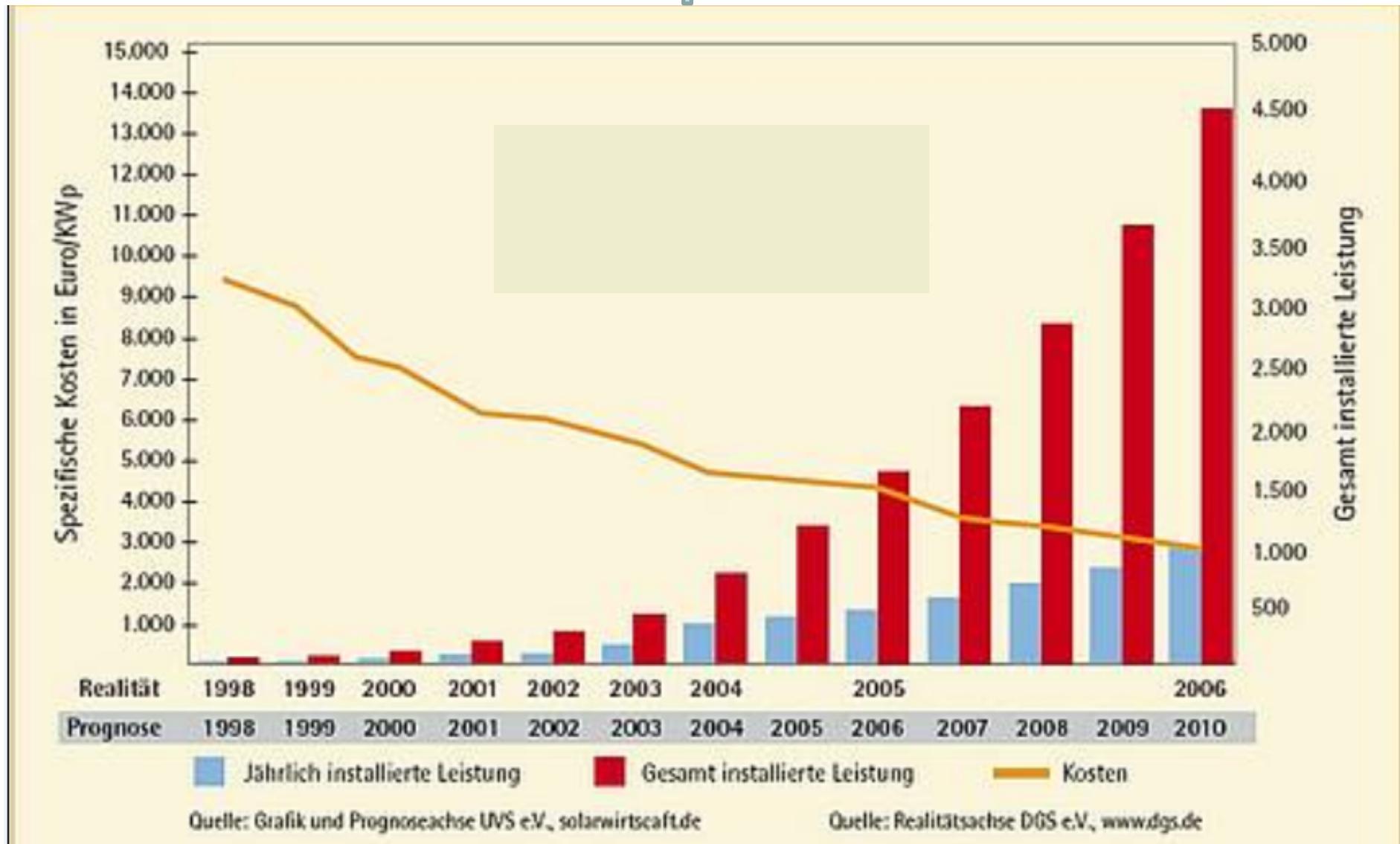
- humans and nature**
- heart and brain**
- short term and long term,**
- public and private, (state and markets)**
- speed and stability,**
- feminine and masculine,**
- equity and rewards for achievement.**

Part Three of the book is pragmatic, political, and optimistic.

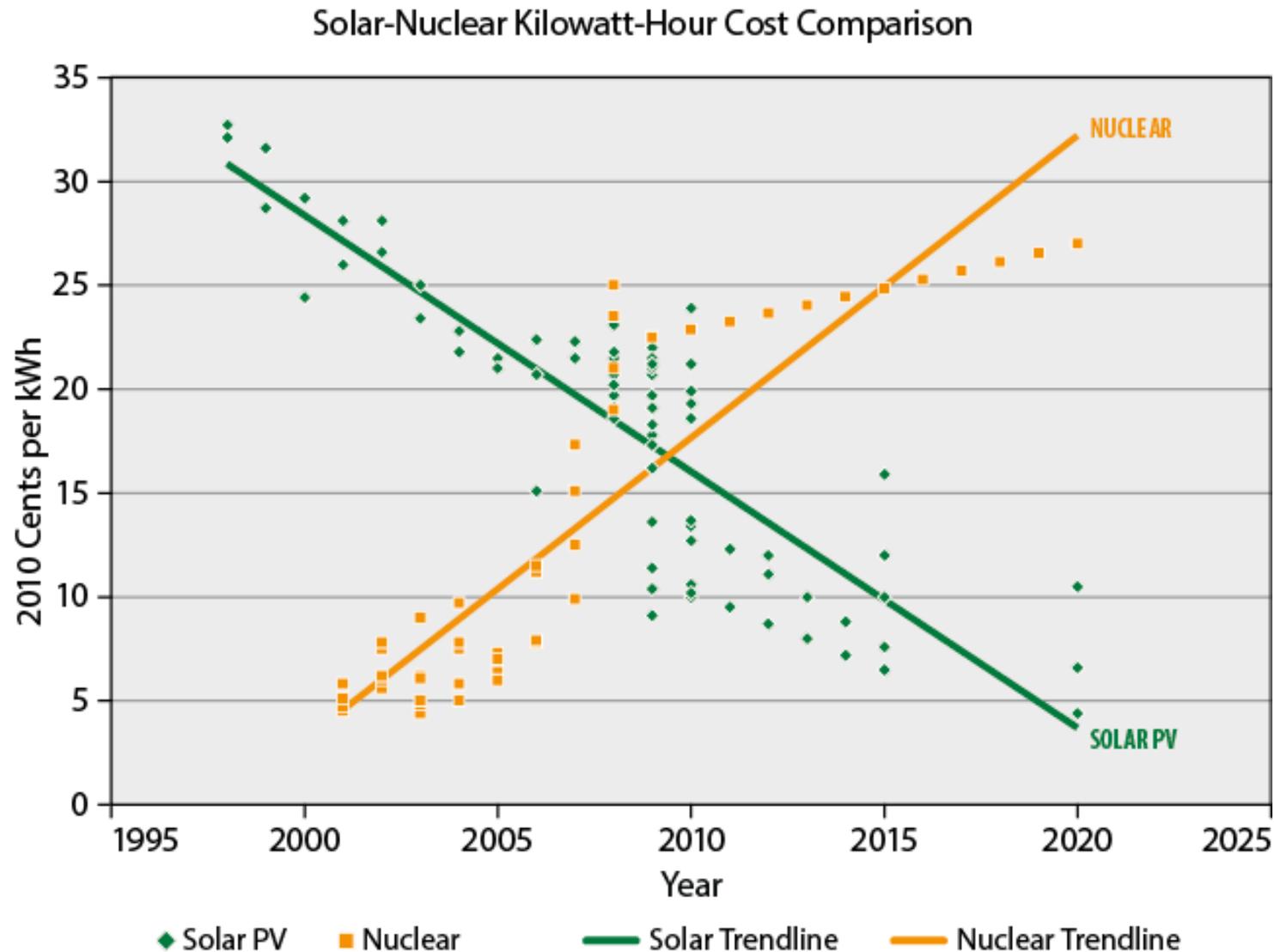
- **Energy**
- **Circular economy creating jobs**
- **„Blue Economy“**
- **Engaging civil society**
- **Financial reform curbing speculation, tax havens („Panama“) etc.**

(5 out of 20 items)

Renewable energies: Here in Berlin, the „EEG“ was born, internationally called feed-in tariffs law, that triggered the formidable rise of renewables.

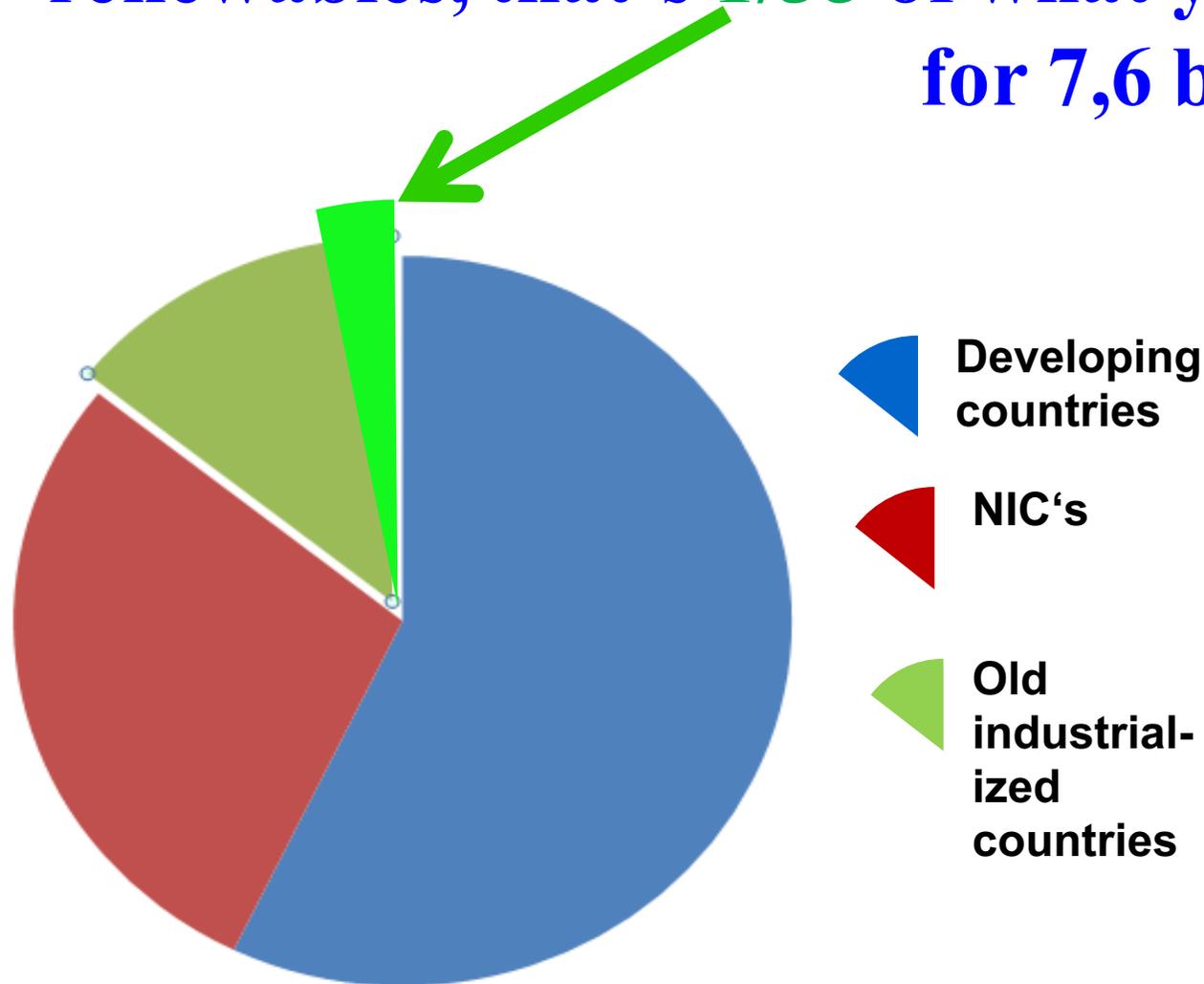


Feed-in tariffs laws boosted wind, solar, etc. They are now beating nuclear cost-wise ...



Of course, the solar lobby is excited by the prospect of 100% solar. But I beg to consider the quantitative dimension ...

If 1b people (the rich) achieve 20% new renewables, that's **1/35** of what you would „need“ for 7,6 b people on earth.



Imagine a 35fold increase of today's biofuels, wind power, hydropower, solar power. That's an **ecological nightmare!** Meaning: we also have to turn our attention to efficiency.

For that please consider what a kwh can do:



**Imagine a bucket of
water of 10 kg weight**

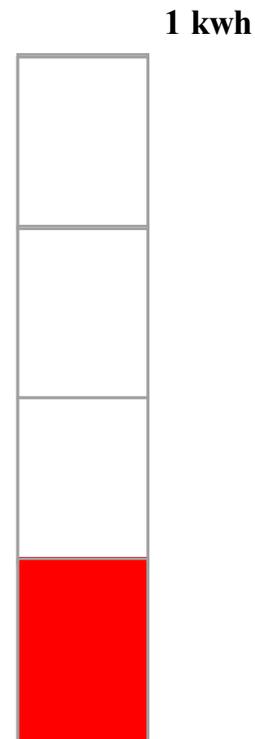
**How many
kilowatt-
hours**

**do you need to lift it
from sea level
to the top of Mount
Everest?**



**The answer is
stunning:
One quarter of a
kilowatthour!**

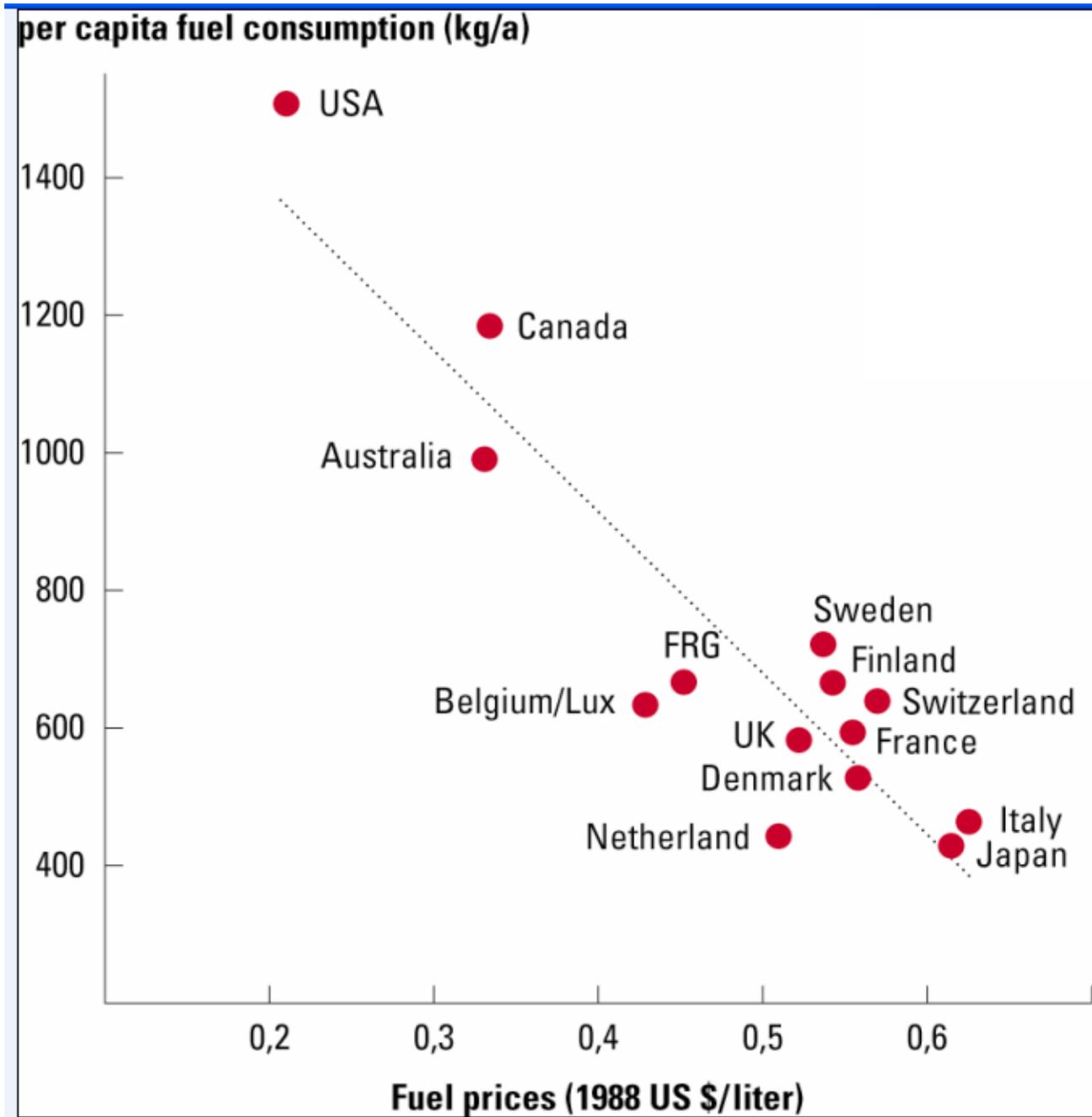
**(knowing that one watt-
second is one Joule or one
Newton-meter; $\frac{1}{4}$ kwh is
900.000 watt-seconds)**



Meaning that we probably have absolutely no additional „energy demand“, but a **huge demand for energy wasting** - which we then call „energy demand“.

Energy demand is hugely price dependent!

(Long term price elasticity of fuel consumption is very high!)

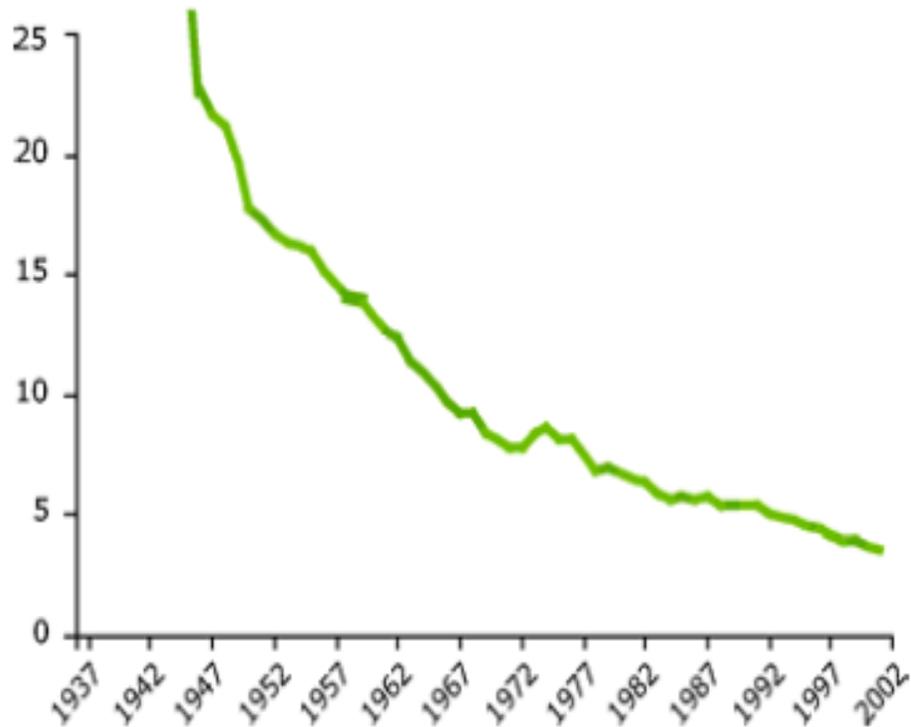


Source: Jesinghaus,
in Weizsäcker &
Jesinghaus, Ecological
Tax Reform 1992, p32

What's the effect of cheap flights? Make a guess!

Rapid decrease in international flight prices

USD 1978 cents/mile



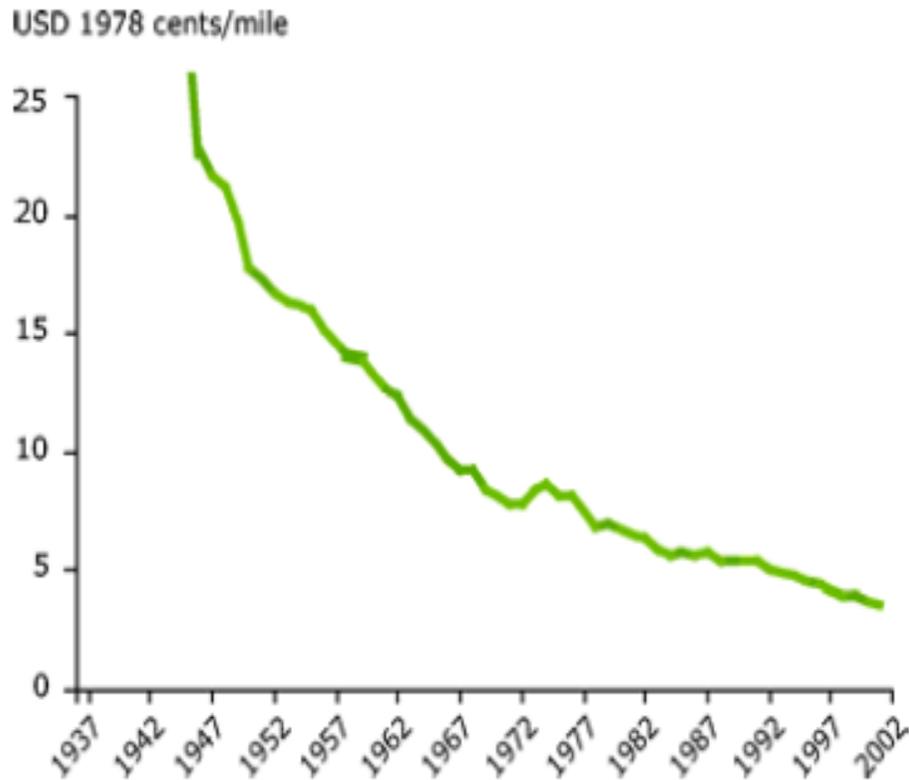
Note: Yields of US airlines in international traffic.
Domestic figures show similar trends.

(EEA, 2005)

What's the effect of cheap flights? Make a guess!

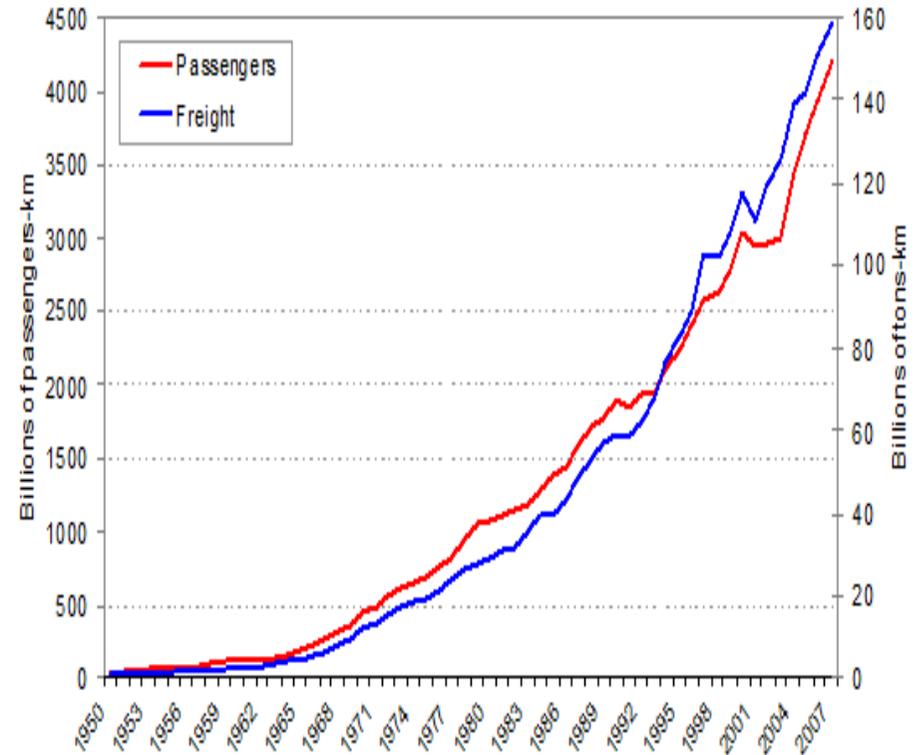
here is the answer:

Rapid decrease in international flight prices



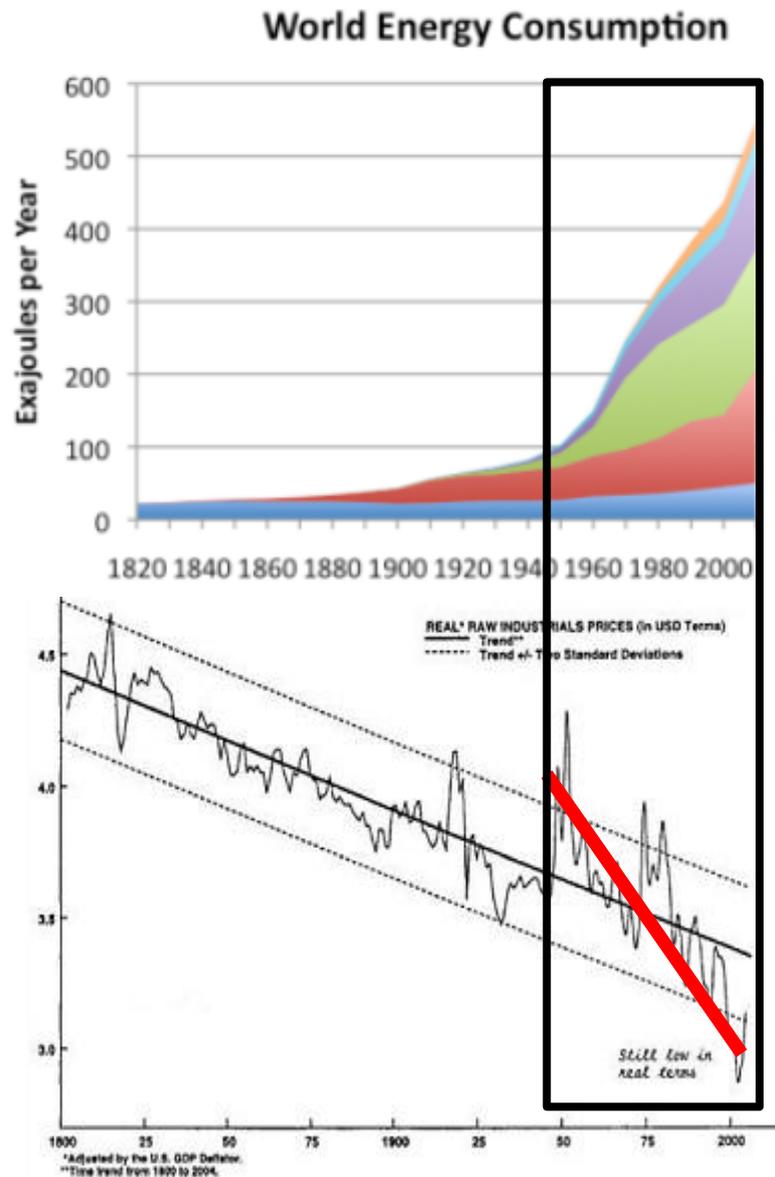
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Source: Air Transport Association

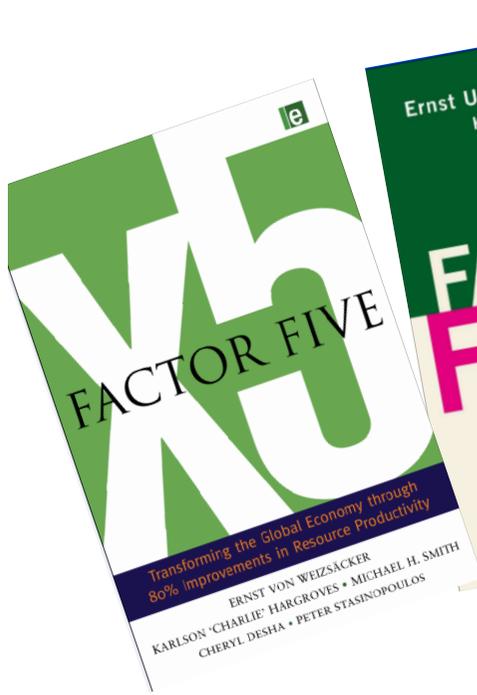
World energy consumption steeply rose during the decades of rapidly falling energy prices.



The decades of explosive growth of energy (and material) use were

...

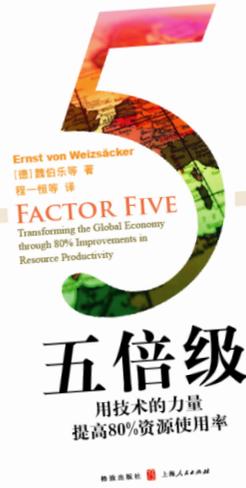
...
the decades of rapidly falling commodity prices



2009



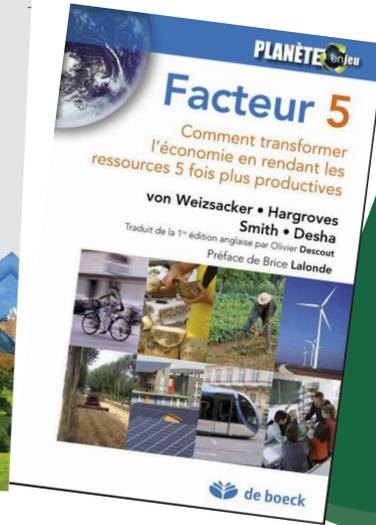
2010



2010



2012



2013

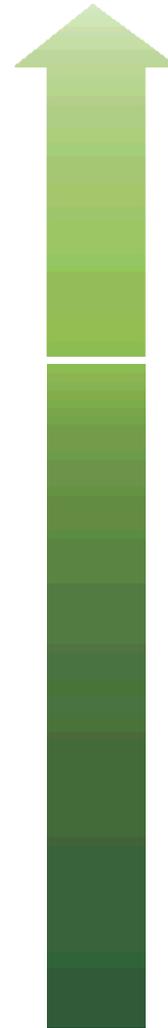


2014

**Factor Five shows that a five-fold increase of energy and carbon efficiency is doable.
(No need in this eceee community to go into details!)**

New cars five times more fuel efficient

Today's fleet
5-10 l/100km

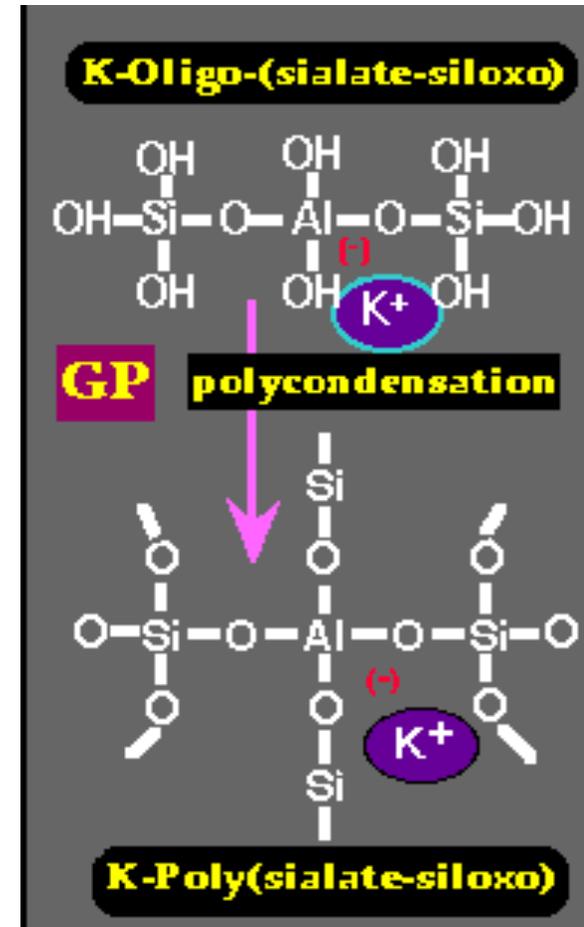
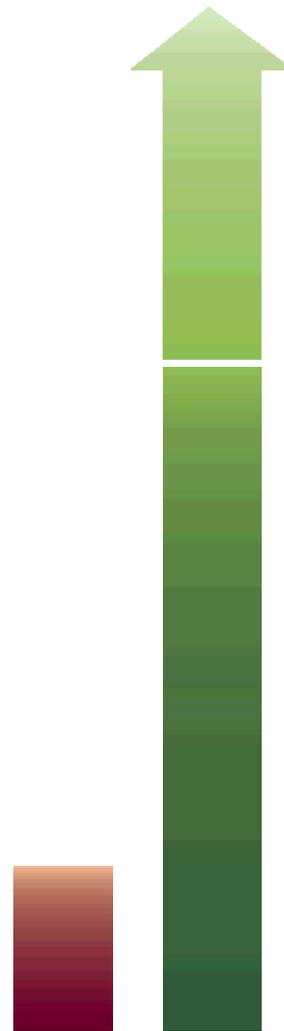
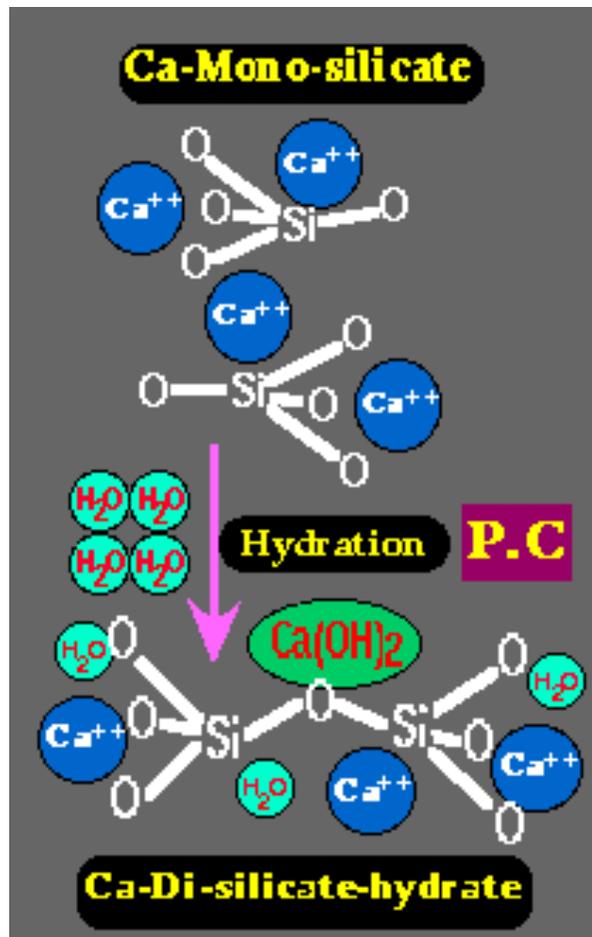


Volkswagen XL 1
0,9 l/100km



Energy efficiency

Portland cement needs about 3 times more energy than geopolymers. Adding recycling of cement and concrete, a factor of five is possible



Energy efficiency

Power to gas. Windparks often produce more power than the grid can absorb. Such excess power can be transformed into hydrogen or methane. Chemical energy storage is a lot more elegant than electrical storage. Audi thus offers „climate neutral driving“.



Demand management and smart grids:

In areas where wind dominates power supplies, utilities seek agreements with power intensive industries on idling such processes during times of low power supply. Utilities even pay money for „not demanded kwhs“.

That's an example of industry size „smart grids“.

Another element currently on the rise is power storage. Combinations of demand management, storage and power to gas become mainstream in our days, with very substantial potentials of reducing CO₂ emissions.

Policy questions. We have 3 options:

Command and control, - including standards and bans.

Tradable permits. Worked for some air pollutants, water extraction, land use, but not so well on CO₂.

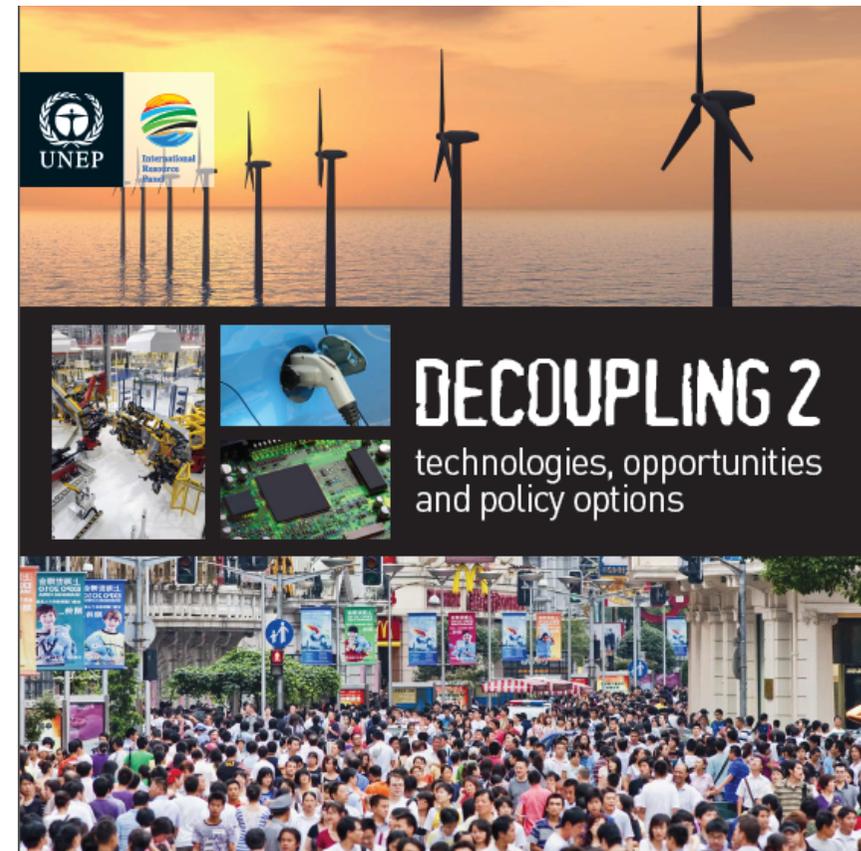
Direct pricing. This is the underestimated, sleeping giant!

If you want efficiency, direct pricing is best. It needs no bureaucracy and triggers creativity.

Clearly we must avoid capital destruction, industry emigration, and social injustice.

**Reflected in a 2014
report of UNEP's
International Resource
Panel.**

It's called Decoupling 2.



The IRP Report proposes a three step pricing scheme that is socially acceptable and can even help industry.

- 1. Make energy and resource prices rise slowly, in proportion with the documented average efficiency increases.**
- 2. Accept life line tariffs for the poor.**
- 3. Negotiate and adopt revenue neutrality for industry. The Swedish NO_x tax is paradigmatic.**

What IRP is proposing is a ping-pong, similar to the one we had in the Industrial Revolution.



Labour productivity rose roughly twentyfold in 150 years, - and so did wages! Rising wages always triggered creativity for increasing labour productivity, which rose at least twentyfold!!



Example from the USA from 1910 – 1960 showing how wages followed labour productivity

The new „energy ping-pong“ would trigger creativity for *permanently* increasing energy productivity. The factor of five could be reached in 40 years and a factor of ten in 80 years.

The price signal would also reduce wasteful habits and much of the rebound effect.

CO₂ tax or energy tax?

Of course, it will be a lot more popular to increase CO₂ prices instead of energy prices. The renewables lobby is quite aggressive in this direction (like the nuclear lobby was). But it could enlarge biomass monocultures and other plagues, and would not help sufficiency. Still I would accept the CO₂ tax as a first step.

Thank you!