



International Panel
for Sustainable
Resource Management

Open Seminar

Resource Management and the 3R's:
Towards Sustainable Asia
Tokyo, 11 March 2009

Decoupling in the context of Sustainable Resource Management

Prof. Ernst Ulrich von Weizsäcker
Co-Chair, International Panel for Sustainable
Resource Management

Speaking to a broader Japanese audience,
let me begin with a brief reflection on
Japanese history.



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After this, I'll briefly
outline the agenda of
the Resource Panel.

And then move to the core of the
challenges of decoupling.



Agricultural technology in the Edo period

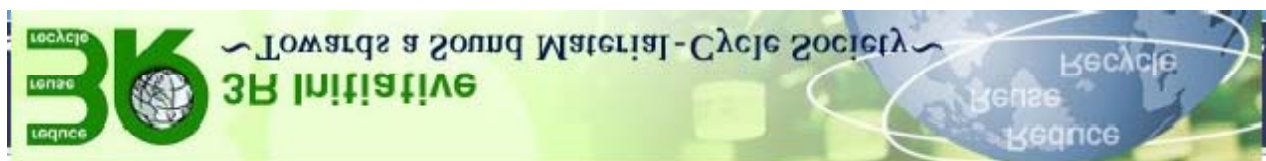
Japan during the Edo period was a sustainable society. Recycling, human modesty, conservation were characteristics of the culture.

A Sound Material-Cycle Society Through the Eyes of Hokusai



This has been the cover of a fine preparatory document for our conference, emphasising the Edo era's material-cycle system

**Even after the Meiji
Restoration, and after 140
years of industrial growth,
many of the old values remain
valid in this country**



**The 3R Initiative can be seen
as a reflection of this cultural
sentiment**

Well, the first of the three R's is

Reduce!

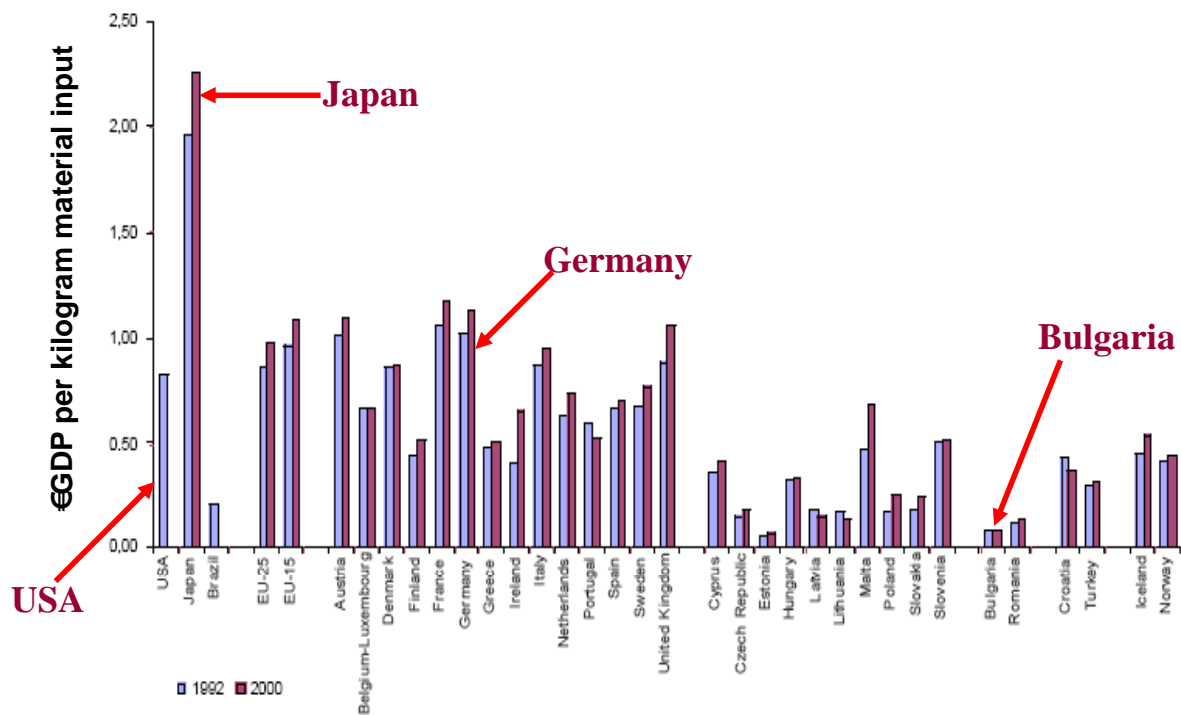
This is not exactly what world politics currently wants. Politically speaking, it is more popular to embrace

Reuse and Recycling

Millions of jobs worldwide are depending on resource destruction and cannot be transformed into sustainable jobs very soon.

Korea seems to show the way by devoting all \$36 billion of her stimulus package to environmental activities aiming to create 1 m jobs.

Japan is the best with regard to decoupling wealth from resource consumption (decoupling measured by resource productivity)



Sources: Wuppertal Institute, 2005; Eurostat, 2004; van der Voet et al., 2004.



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As Co-Chair of the International Panel for Sustainable Resource Management, I am extremely glad seeing Japan as one of our main supporters!



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The Panel was founded in 2007, at a time of very high resource prices and before the economic crisis was visible.



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Although prices have come down recently, the agenda of sustainable resource management remains extremely important both for economic and ecological reasons!

... And it closely relates to UNEP's call for a **Global Green New Deal**.



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**The Resource Panel
created five
Working Groups, on**

- Biofuels**
- Decoupling**
- Metals**
- Prioritization**
- Water**



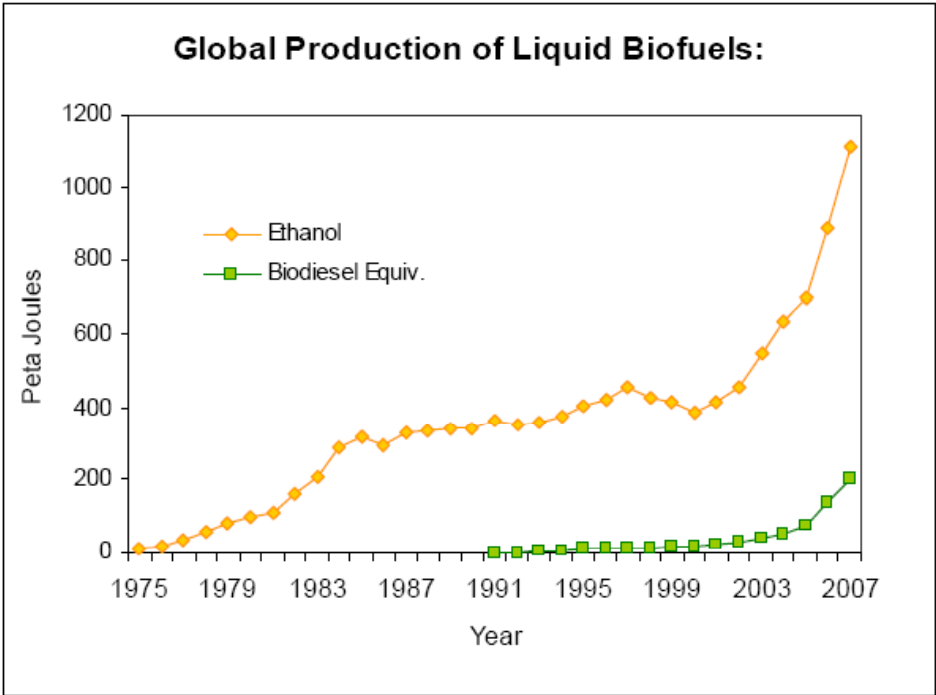
**International Panel
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**The first report
will be on biofuels.**

**It is presently entering the
peer review process.**

**One of its authors, Jeff McNeely, is
here and gave a wonderful talk
yesterday**

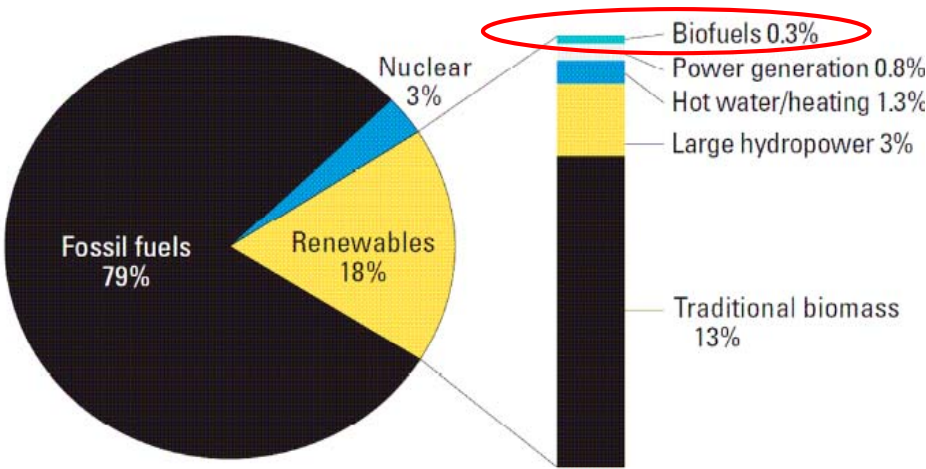
One of the results is that biofuels are steeply on the rise



Source: SCOPE (2009).

... but still marginal on the world scale

Figure 3.1: Renewable energy share of global final energy consumption (GFEC) in 2006.



Source: REN21 (2007).



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**The second report
will be on decoupling.**

**It is almost completed as a
draft for circulation to
group members. After this
round, it will also enter
the peer review process.**



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**The third report
will be on global metal
flows.**

**The Seminar will hear
more about it from
Dr. Yuichi Moriguchi.**



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The fourth report, on prioritization, is looking at which the really important sectors are. The likely candidates are: **construction, transport and food**. The group will analyse facts and policies.



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The fifth group, on water, will first have to look at what is already done by various international agencies and by the commercial water sector.



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During the meeting of
UNEP's Governing Council,
16 – 19 February in Nairobi,
a high level panel was held on
the **Global Green New Deal**
idea, promoted by UNEP

Executive Director Achim Steiner, and the
decoupling agenda. The Resource Panel was
invited to participate in the ministerial level
discussion. But, of course, Korea was the real
champion in the room!



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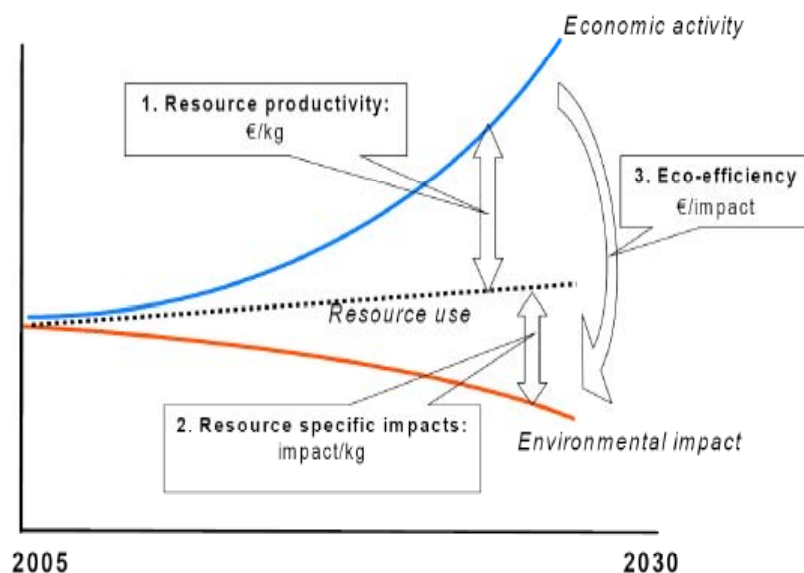
Reflecting on the
Global Green New Deal
now leads me to the
agenda of **decoupling**.

Why Decoupling?

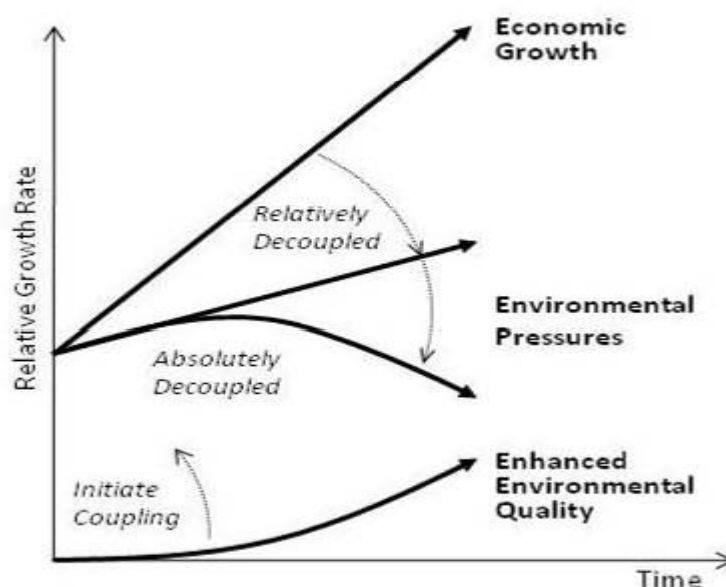
1. 7b people want decent life styles
2. Today's ,decent lifestyles' are resource intensive
3. Decoupling is technically feasible
4. Decoupling is politically attractive

What is meant by Decoupling?

- It is (1) decoupling wealth from resource use
(2) Decoupling resource use from envir. impact

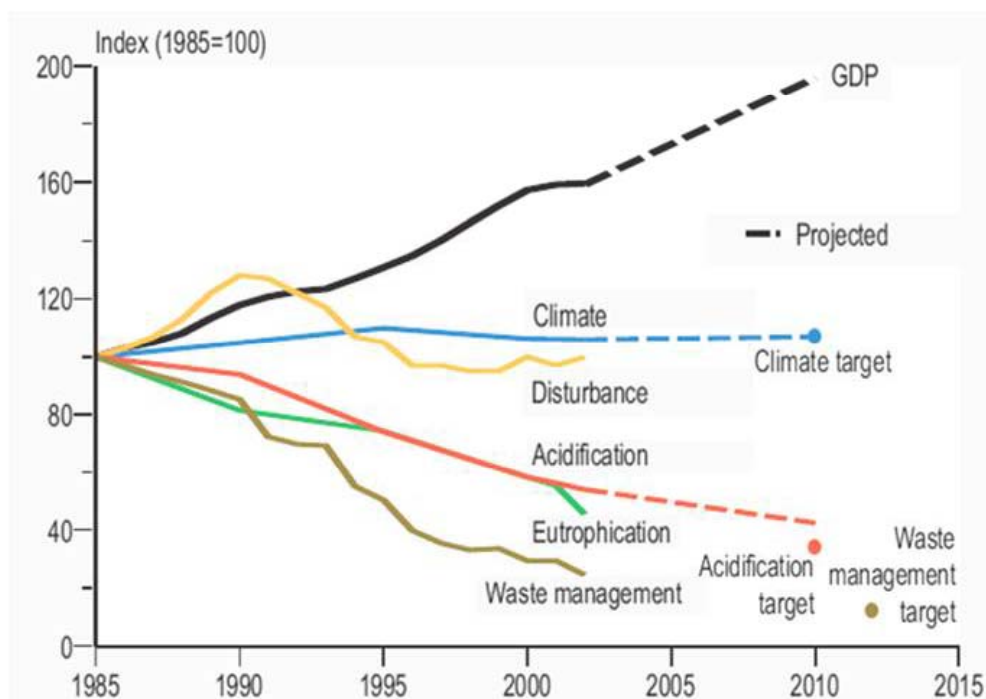


Relative versus absolute decoupling



Picture from Mark Swilling

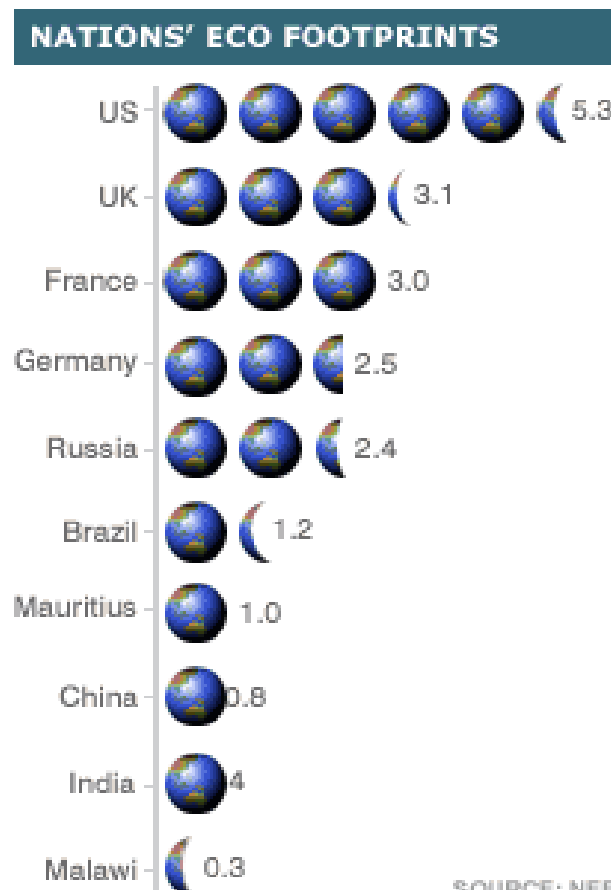
A Dutch case study of decoupling



Source: Netherlands Environmental Assessment Agency (2004)

Rich countries have big carbon footprints and ecological footprints

Poor countries want to get rich, meaning in effect to enlarge their footprints

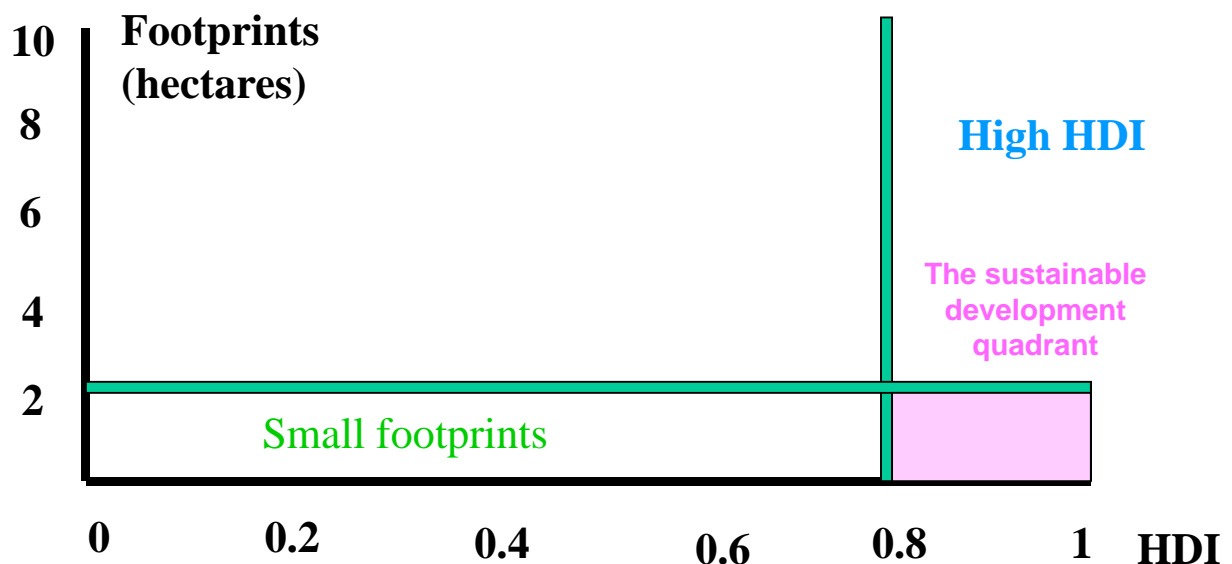


Ecological Footprints:

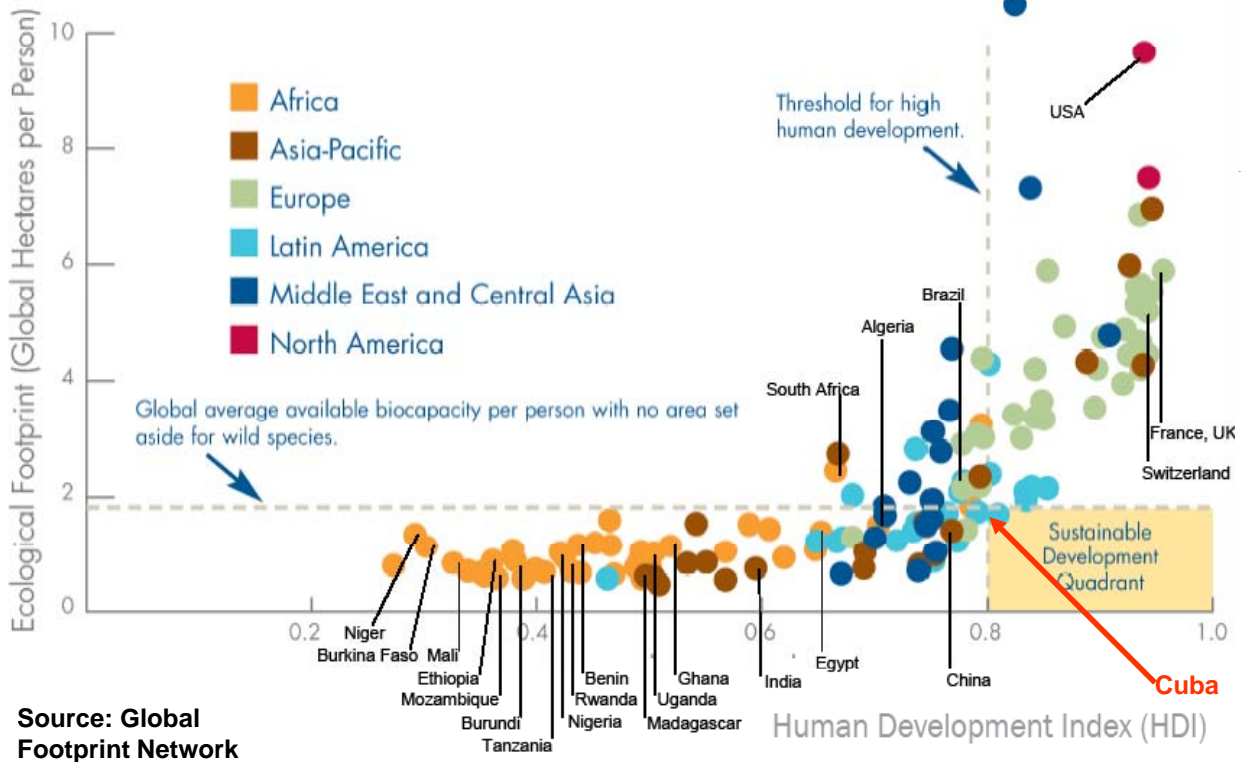
How many Earths would we need to accommodate 6.5 billion people living US, Chinese, or Malawi lifestyles?

People having the choice would rather go for US than for Malawi lifestyles.

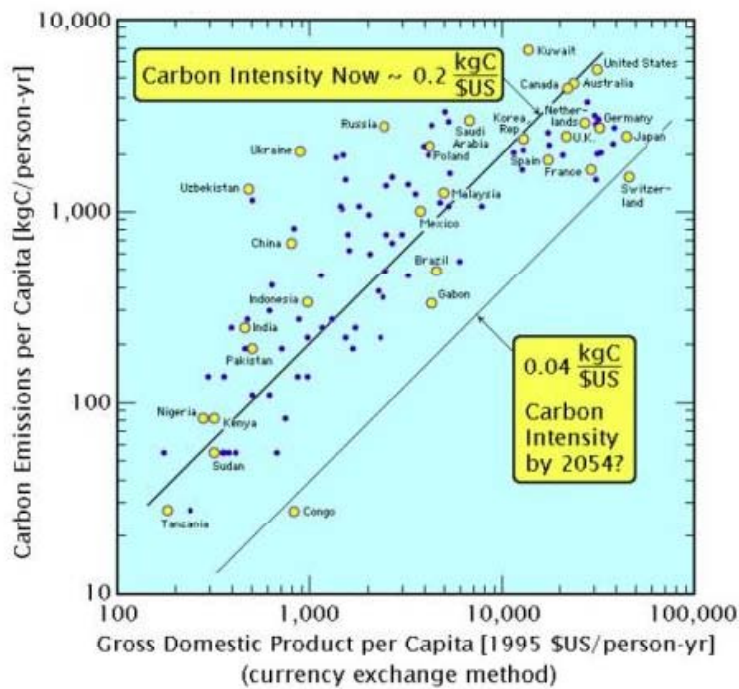
A sustainable society has reasonably small ecological footprints and a high Human Development Index (HDI)



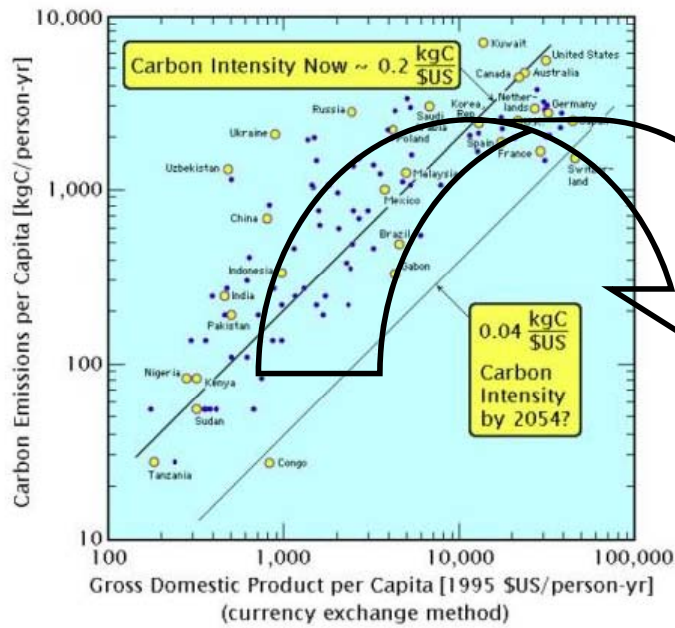
**Empirically, only one country is „sustainable“: Cuba,
- not exactly the most attractive model perhaps**



Conventional wisdom: More wealth, more carbon intensity

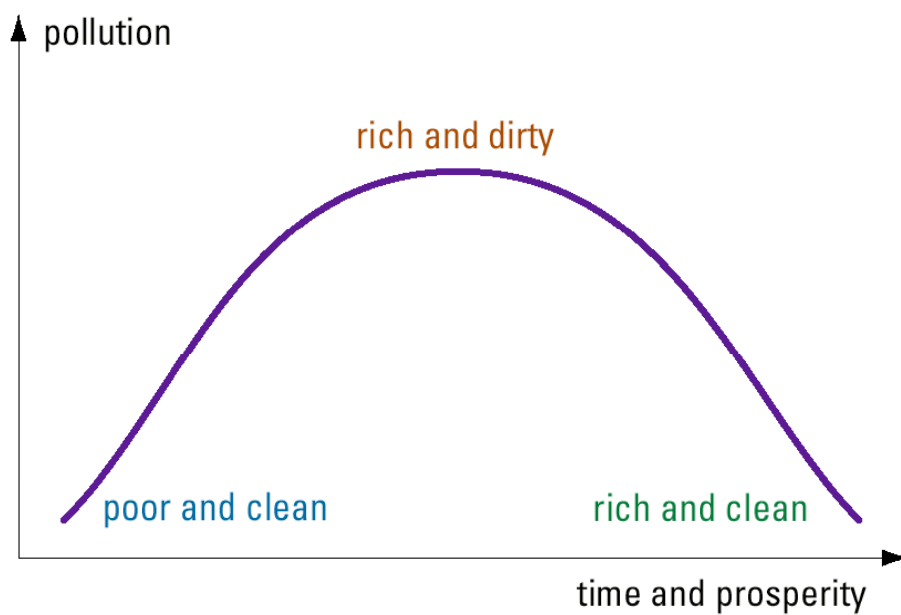


A „Kuznets Curve“ of decarbonization, or escape from the carbon paradigm is needed!



„rich and carbon free“

This is the Kuznets curve of pollution control



Sustainable development has a chance if we learn to extract roughly **five times more ,human development‘ wealth from one hectare of a footprint or from one unit of natural resources.**

More or less the same holds for the **climate challenge:**

If we reduce our **carbon footprints five fold without sacrificing wealth, the problem could be solved!**

This leads to two big challenges:

- (1) Increasing resource productivity **fivefold** (for climate also carbon-free energy counts)**
- (2) Developing a mechanism of **fair distribution****



**On distribution,
during the 2007 G8
Summit, the Indian
PM Manmohan Singh
advocated per capita
equal emission rights**

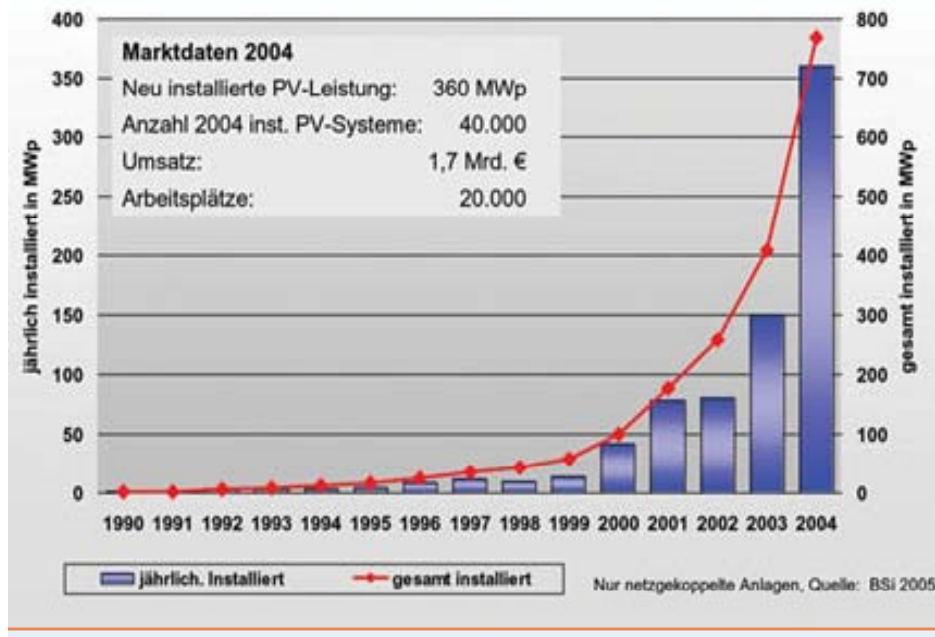


And 2 months later, at the Nikkei Symposium in Tokyo, German Chancellor Angela Merkel, supported the idea!

So let us address the challenge of minimizing carbon footprints and material flows

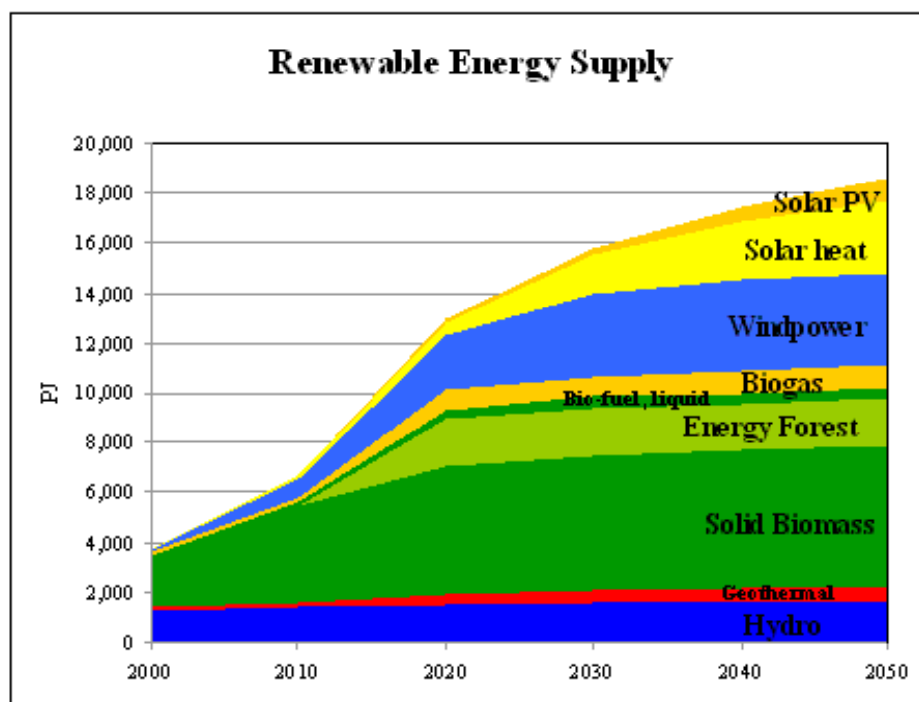
- without jeopardising the increase of well-being worldwide, mostly in the developing countries

I What springs to mind first is renewable energies. They are on the rise, spurred in Germany by the feed-in tariffs



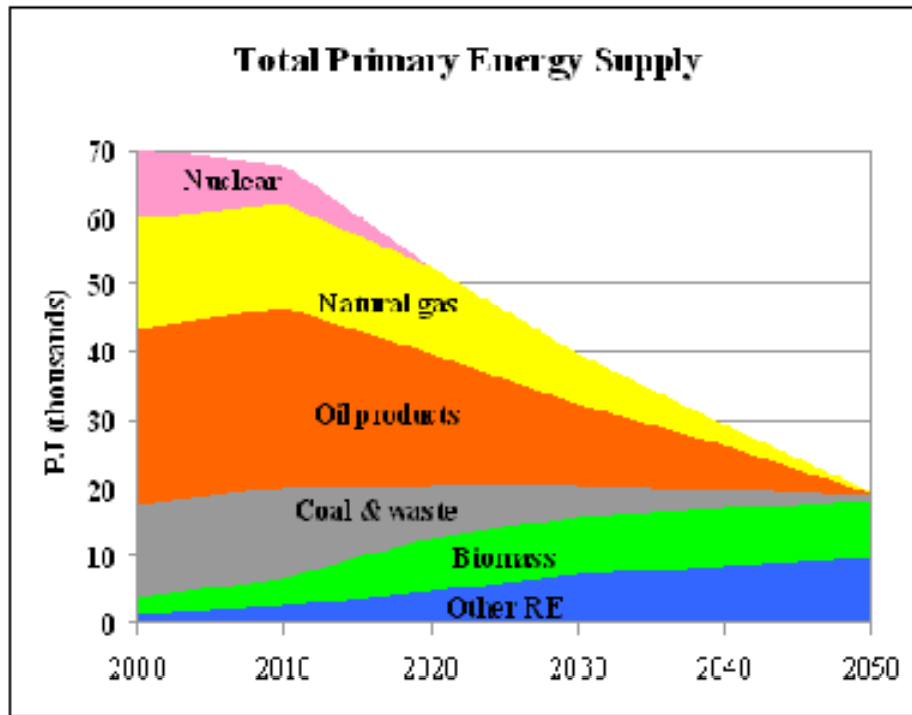
Source: BSi. 2005

Also the EU embraces renewables. But (realistically) they foresee flattening after 2020 (EU Vision 2050)



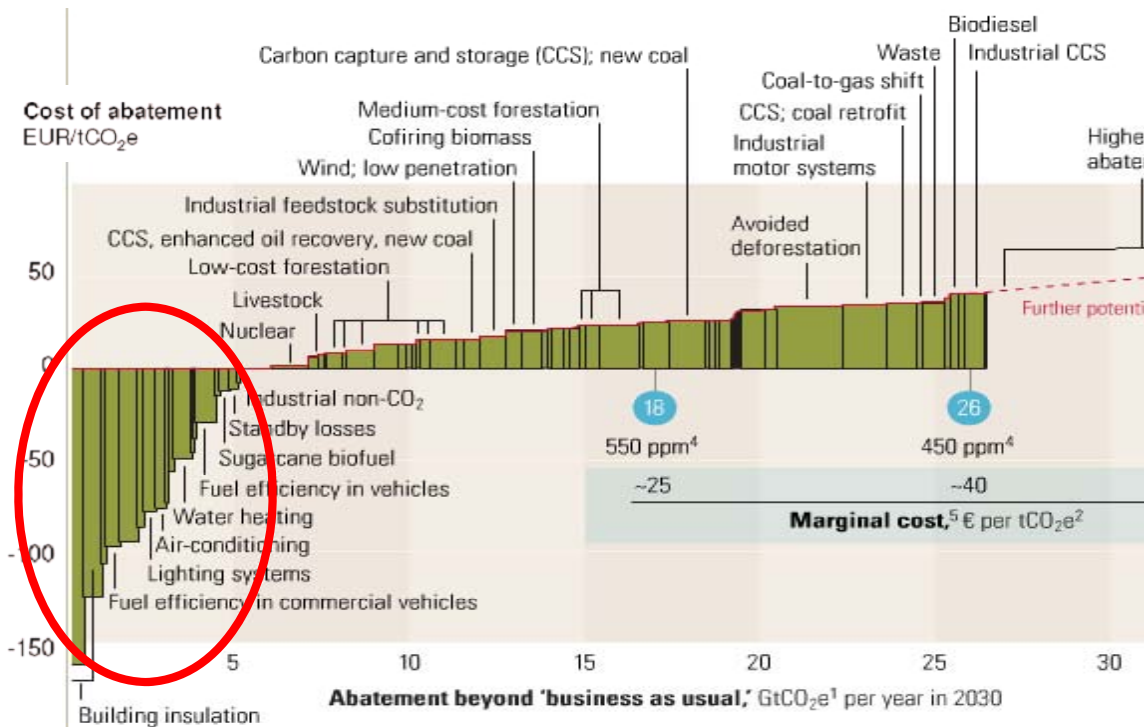
Source: EU-27 Renewable Energy Growth. Dec. 2007

The EU Vision 2050 suggests a fourfold increase of energy productivity, and a **moderate** increase of renewable energies



Source: Vision2050 for the EU 27, Brussels Dec. 2007

The win-win options relate to efficiency, not renewables!



Source: MacKinsey & Vattenfall 2007

Efficiency can do wonders

Let us do a little calculation



Imagine a bucket
of water weighing
ten kilos.

**How many
kilowatt-
hours**

would you need to
lift that bucket
from sea level
up to the top of
Mount Everest?

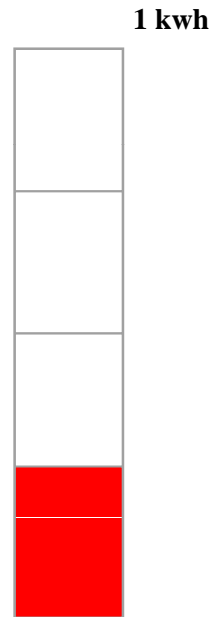


Knowing that one Watt-second (Ws) is equivalent to one Newton-meter, (1 Joule)

the answer is:

One quarter of a kilowatt-hour!

(= 900.000 Ws)

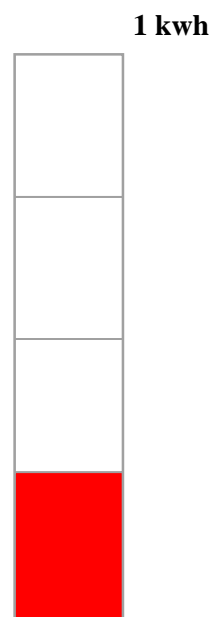


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So you won't be surprised learning that a fivefold increase of energy productivity is available

“Factor Four” (1995) offered fifty examples of quadrupling resource efficiency/productivity



... and a new book, **Factor Five**, is under preparation

Amory Lovins' Hypercar is up to seven times more fuel efficient than today's cars

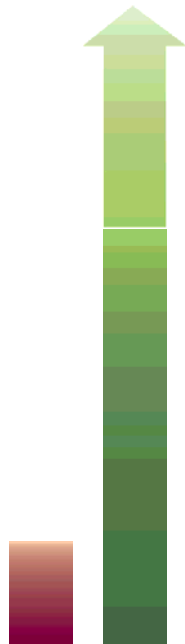
Today's cars
5 – 10 l/100km

Hypercar
< 1 l/100km



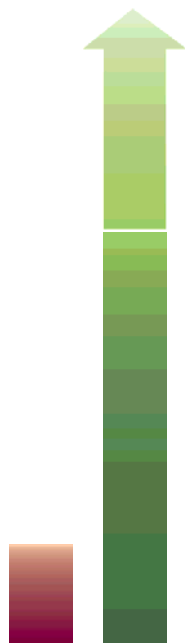
Fuel efficiency

Solar „passive houses“ save 90% of heating energy



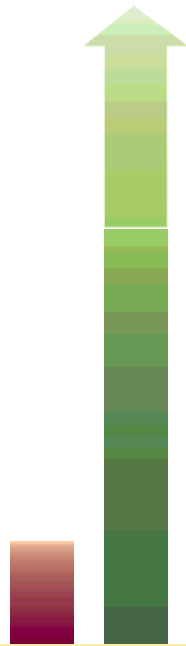
Energy efficiency

From incandescent to fluorescent lightbulbs



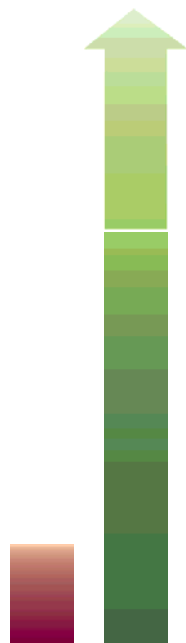
Energy efficiency

...and another factor of 2 – 3 with solid state lighting



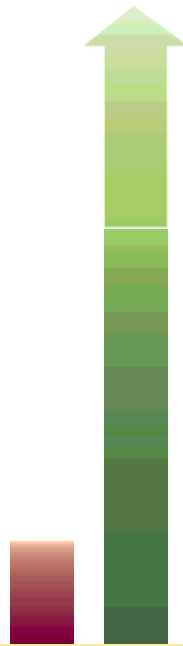
Energy efficiency

Modern Japanese steel can be 4 –10 times more resource efficient



Energy & material efficiency

From flushing toilet to composting toilet



Water efficiency

Those are the rather rare low hanging fruits of fourfold **efficiency** increases of simple processes.

Bigger gains can come in when optimizing complex systems. Here, we talk about **productivity**

Steering instruments

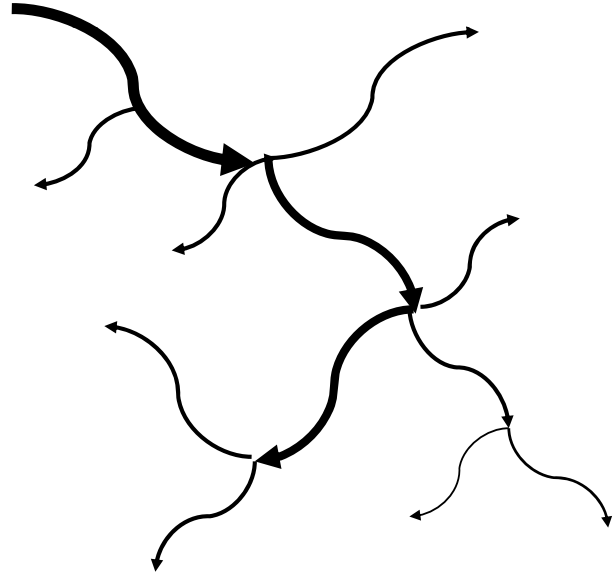
Regulation

Technological efficiency gains, mostly inside the box

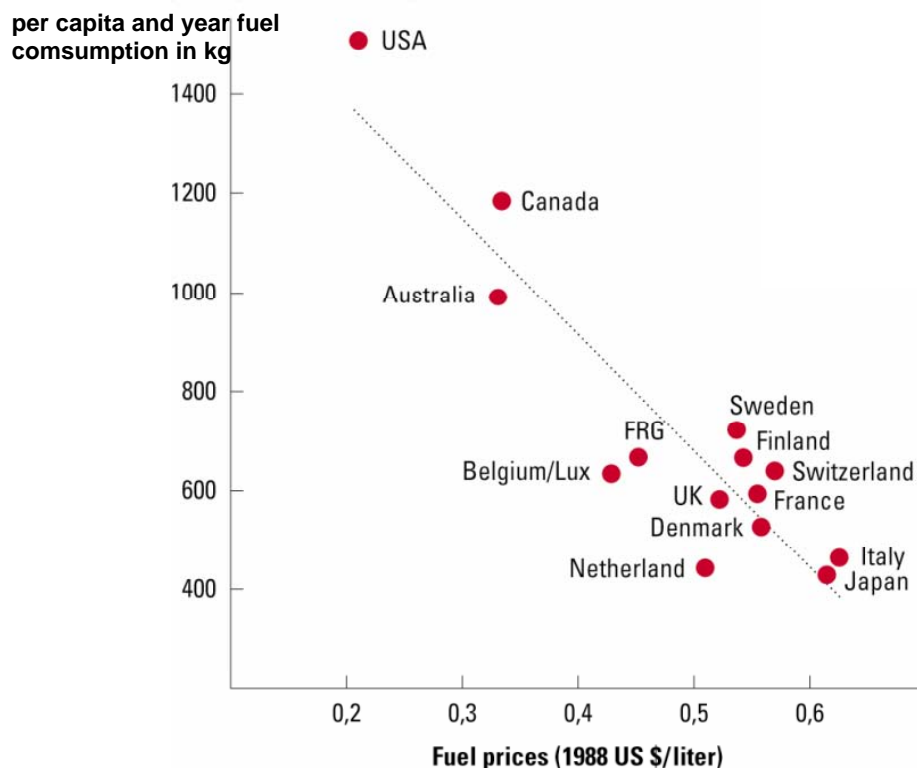


Economic Instruments

Adding a price tag on consumption: networks and cascades get leaner

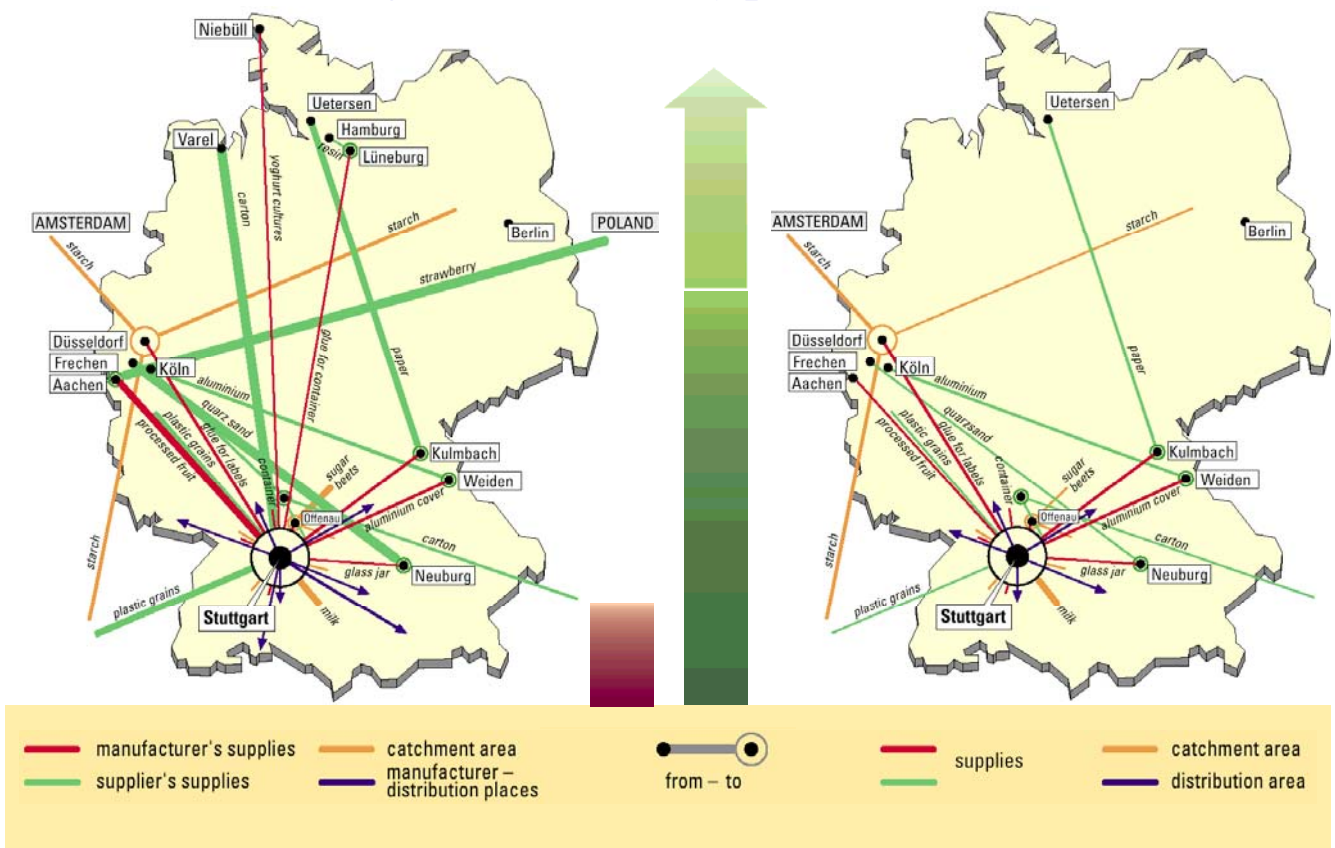


Japan in the 1980s was four times more fuel efficient than the USA and had four times higher fuel prices



Let us now look at some examples of increasing *systems* productivity

Strawberry yoghurt logistics: 1500 instead of 8000 kilometres (logistics is extremely price-sensitive!)

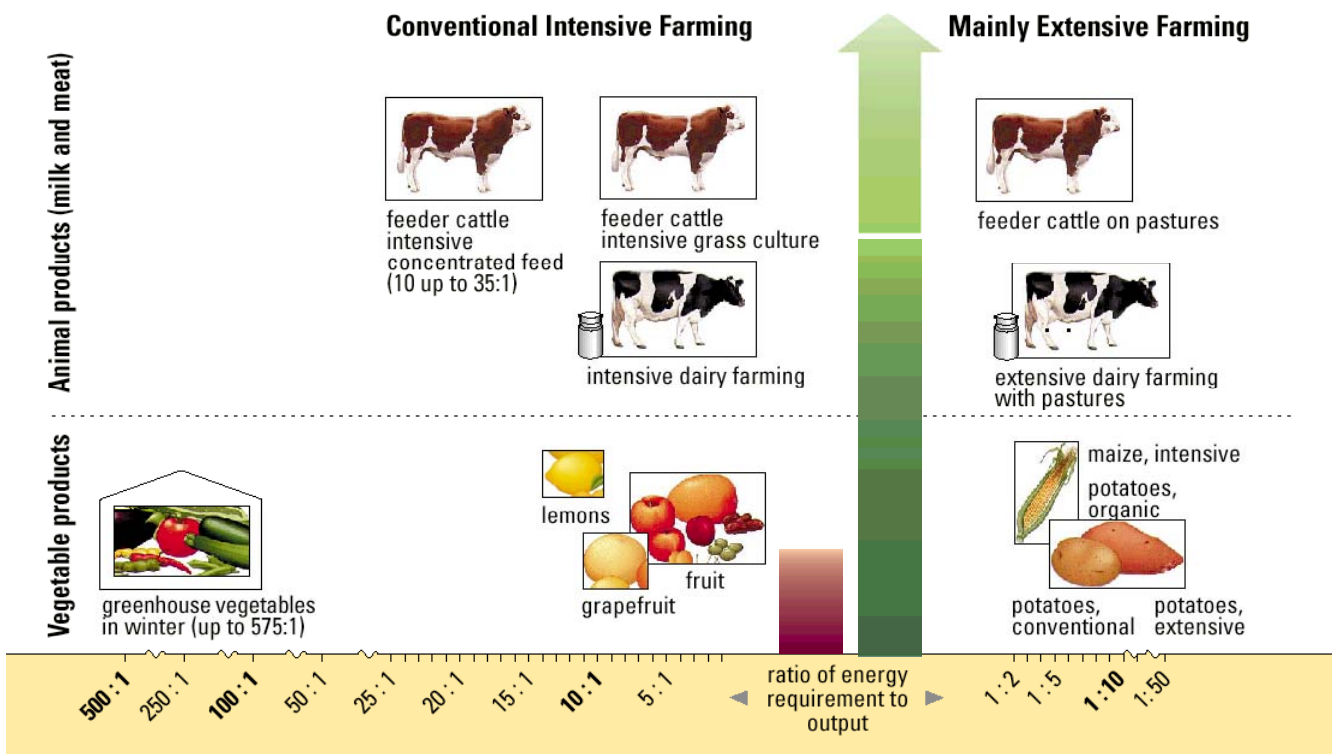


Refurbishing existing buildings can also yield up to 90% improvements but won't be done at low energy prices

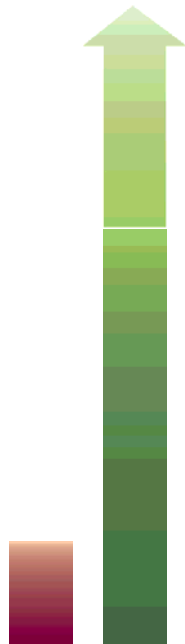


Above: photos
Below: thermograms

Seasonal diets, organic farming, a little less meat (stop all subsidies for high-input farming!)

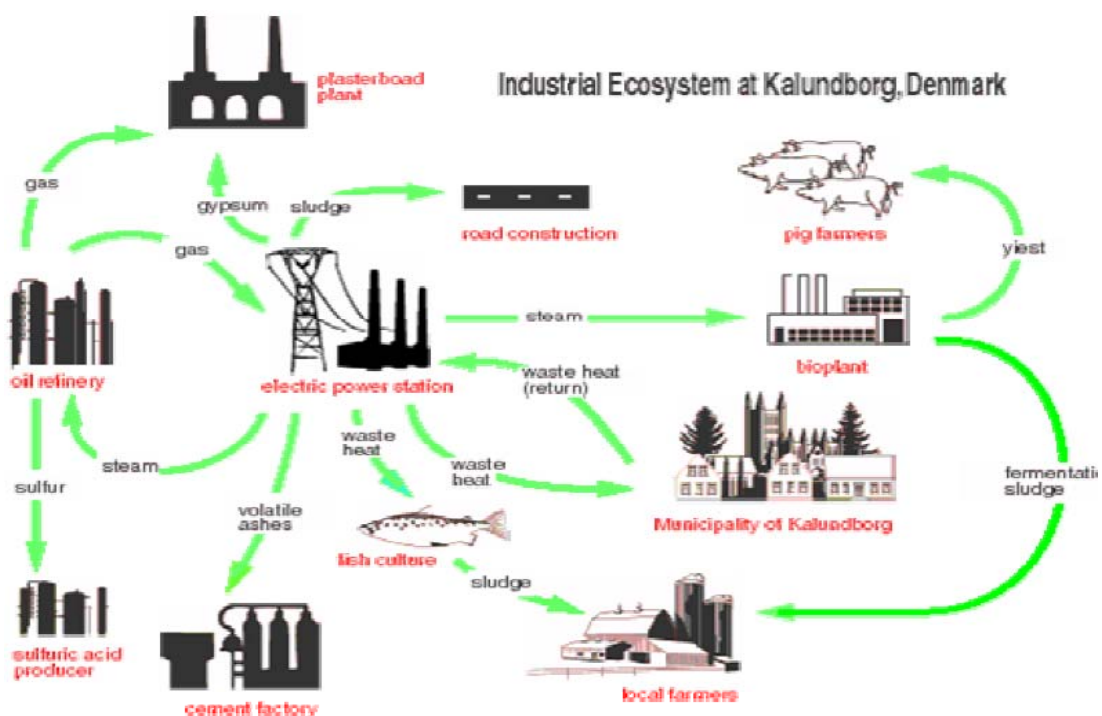


From urban sprawl to high density cities (this is essentially USA vs Japan)

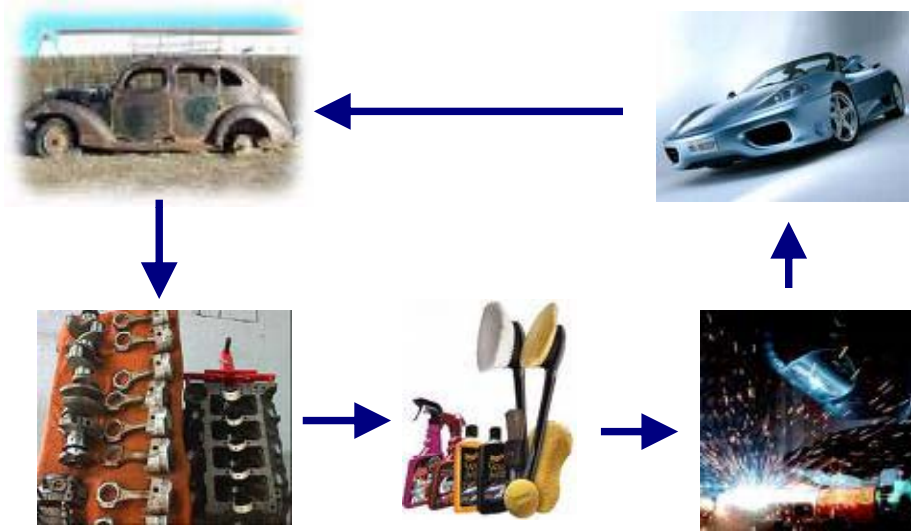


Space and energy efficiency

Entire webs of economic activity can increase productivity

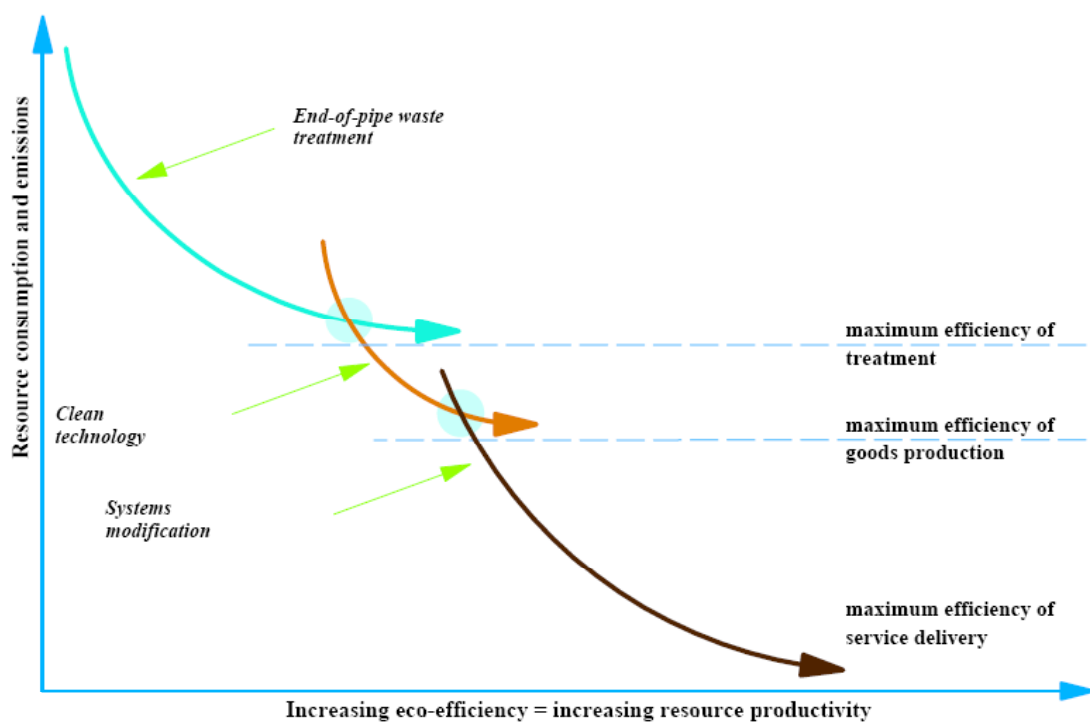


Remanufacturing

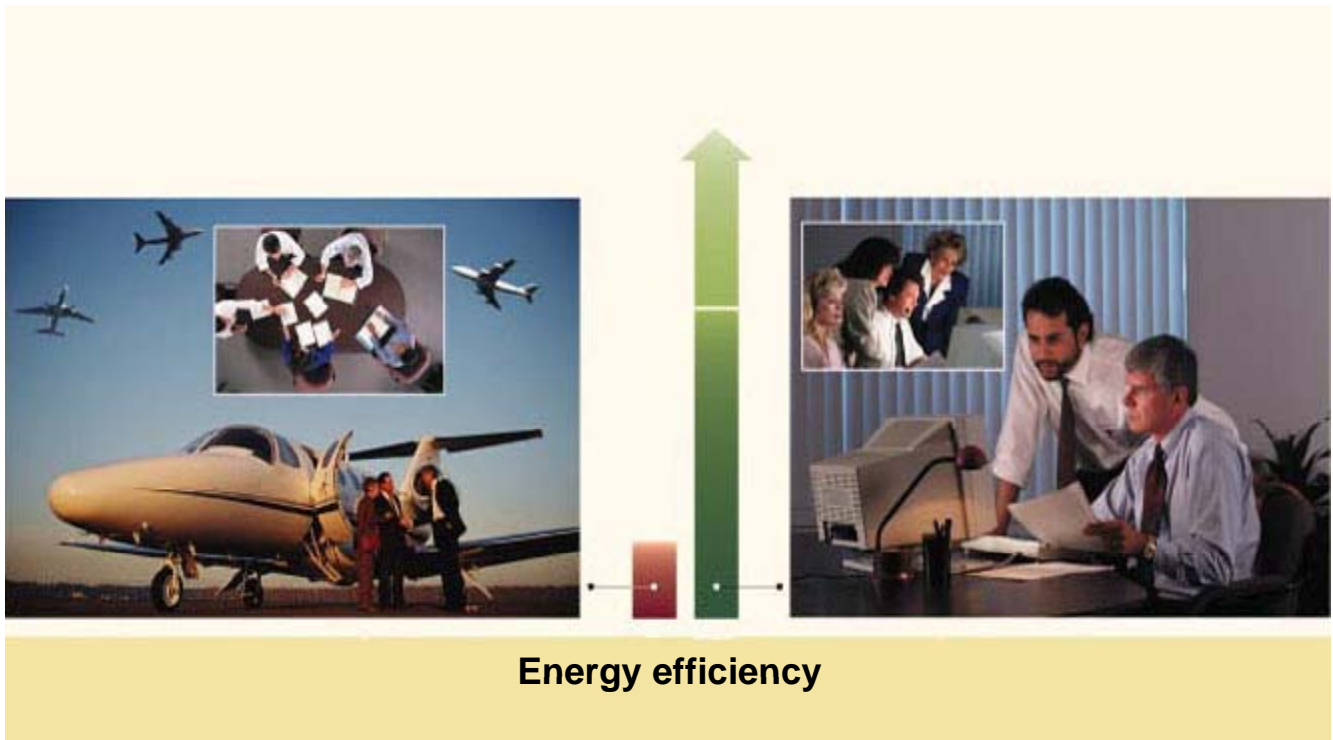


... can be much more resource efficient than recycling

Three phases of increasing resource productivity (Bob Ayres, 2007):
A new concept of added value is emerging (if prices are right)

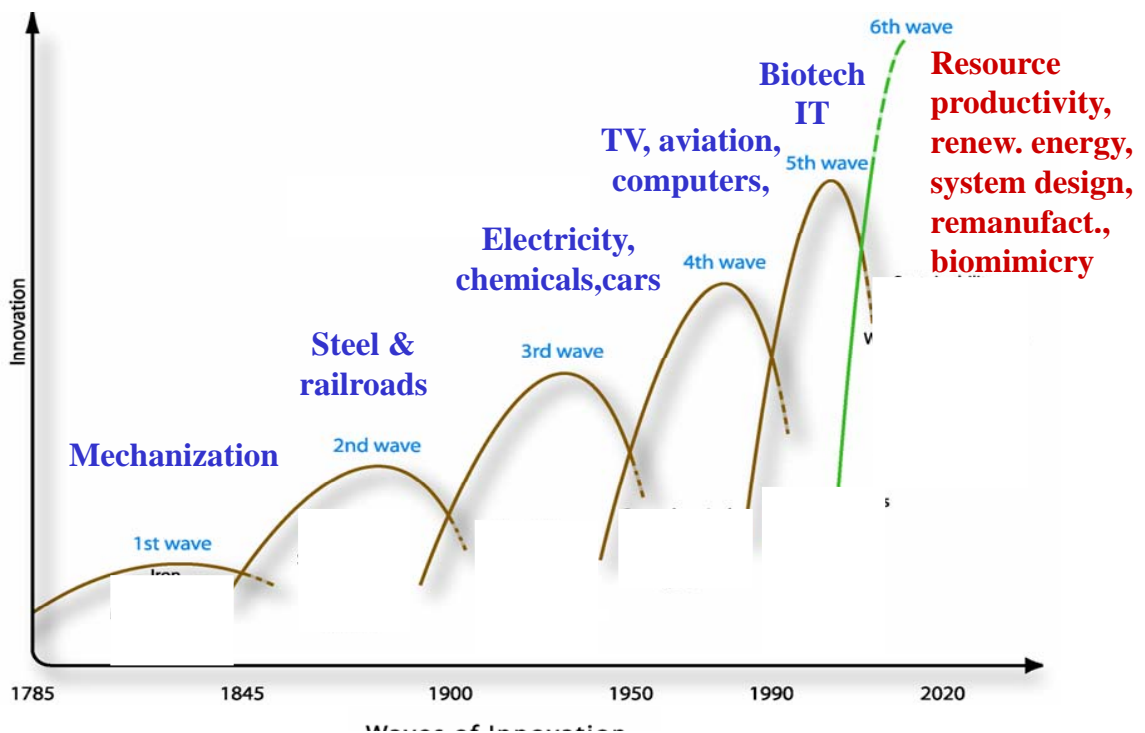


Video conferences can replace a lot of business travel (one of the few examples that is not too price sensitive)



The sixth Kondratiev: Resource productivity

(after Charlie Hargroves, Brisbane, Australia)



Changing technological paradigms

Old:

**Increasing
labour
productivity**

New:

**Increasing
resource
productivity**

If labour productivity has increased twentyfold since 1850, it is not utopian to think of resource productivity increasing tenfold in 100 years and fivefold in 50 years!

What was the main driving force for the steady increase of labour productivity?

Economists would say it was labour cost.

And what was the main driving force for the twenty-fold increase of wages?

Economists would say it was labour productivity

Labour productivity rose in parallel with labour costs

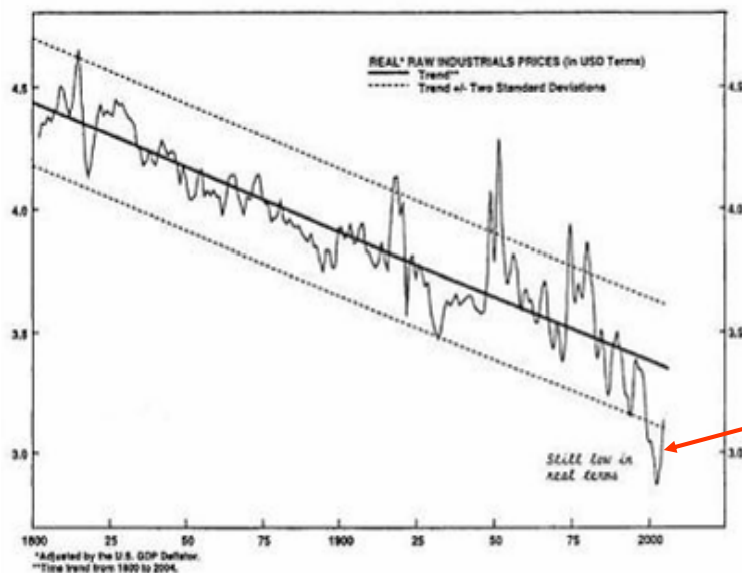


**But resource prices hav been falling
over the last 200 years!**

**Hence there was little incentive to raise
resource productivity.**

During 200 years resource prices were **falling. Recent price hikes
just brought us back into the **lower** confidence interval! And since
the Wallstreet crash, prices came back to very low levels.**

Prices of industrial commodities & energy, in constant dollars



**The last
5 years**

Source: The Bank Credit Analyst

This suggests a policy change:

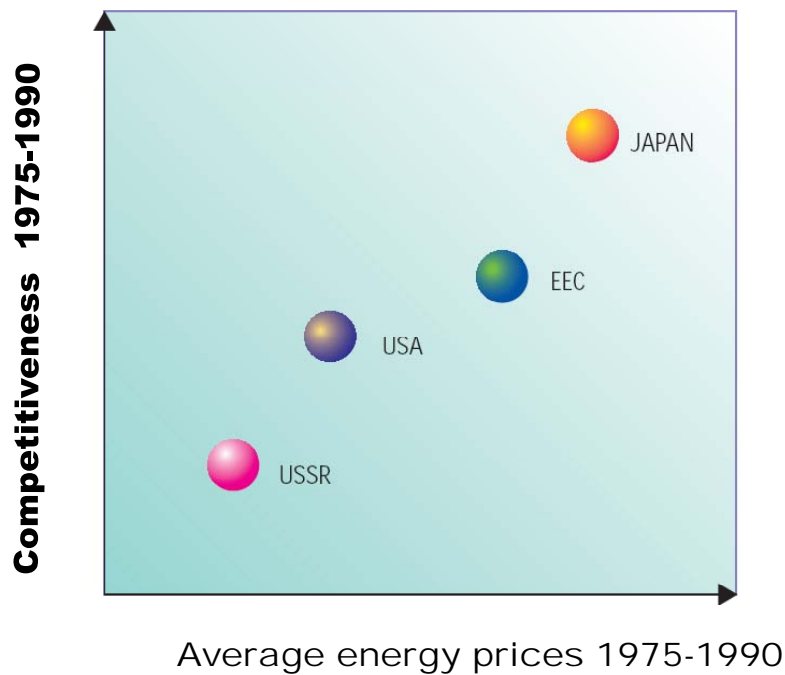
Let us raise energy and primary material prices in parallel with resource productivity gains.

And make that a long-term predictable policy investors can rely on.

No social hardship expected from a trajectory of slowly rising energy prices.

Predictability and smoothness are extremely valuable for a country's social and economic development.

Moreover, high energy prices need not hurt the economy at all. Japan blossomed during the 15 years of highest energy prices.



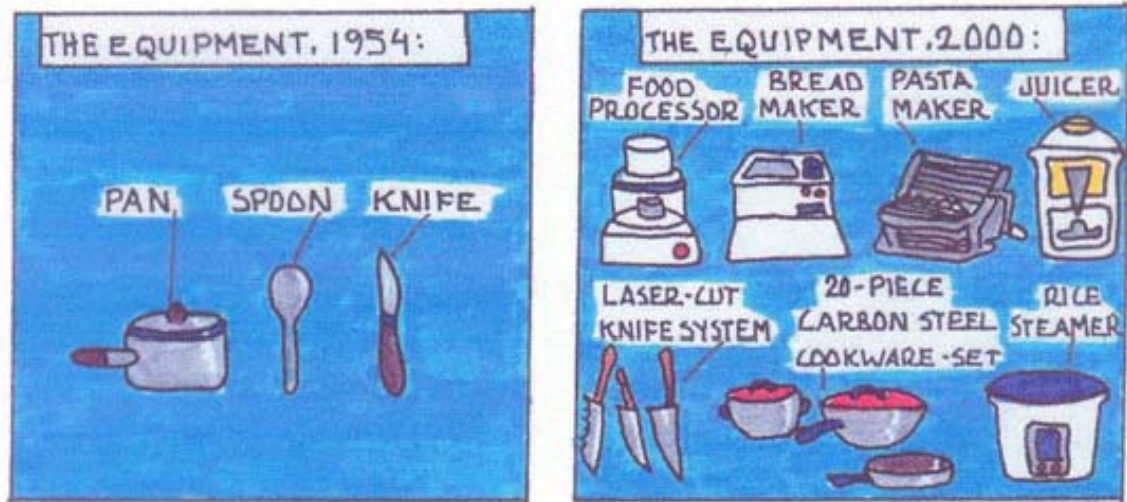
Efficiency and productivity are great,

but there is also a case for **Sufficiency**

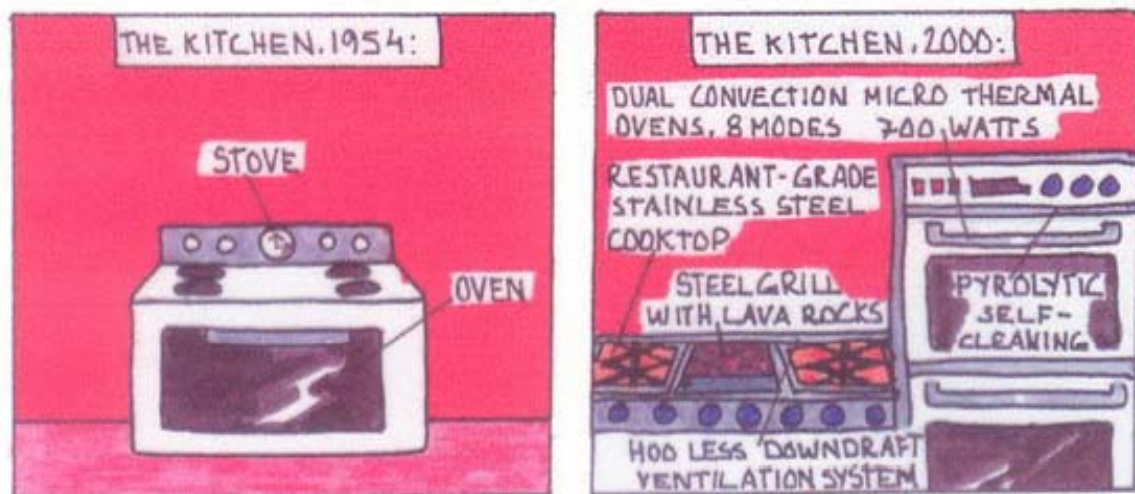
To comprehend the scope of sufficiency,
let's have look at

Economic growth in the kitchen

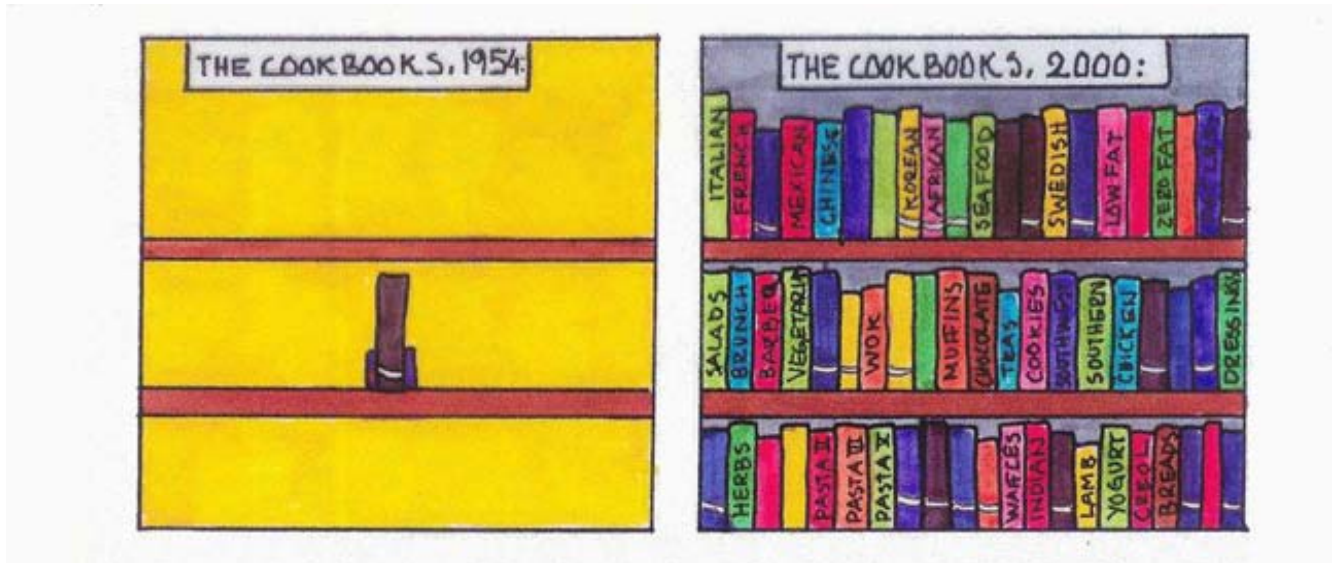
Economic growth in the kitchen



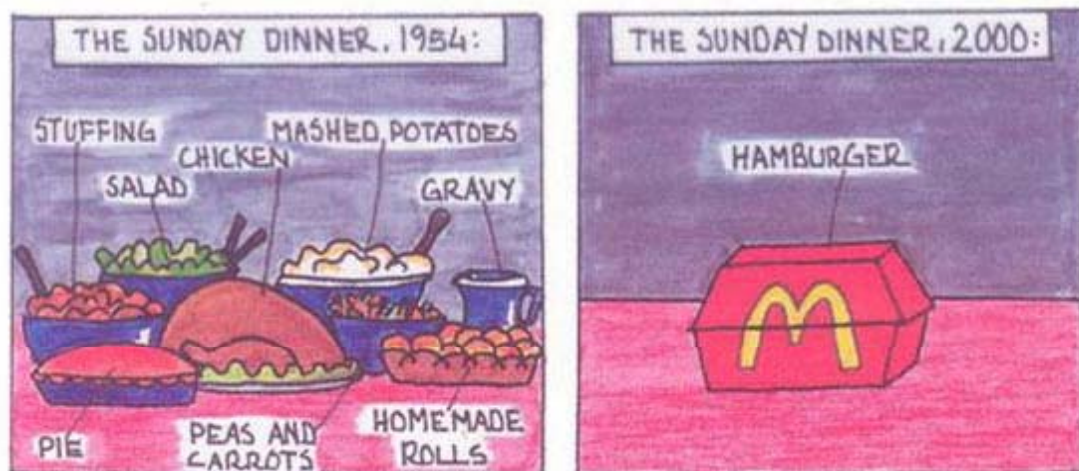
Economic growth in the kitchen



Economic growth in the kitchen



And now the Sunday dinner!



Source: John Holmberg