



# How the World Is Changing and What Does This Imply for SD?

ESDN Conference, *Vienna, June 14, 2013*

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# Who am I?



- Worked for futures studies & sustainability issues for more than 20 years
- Acted as as a director of Finland Futures Research Centre and professor of futures studies in Turku School of Business
- Member of Club of Rome and activist in Finnish association
- Invited as a futurist and sustainability promoter in Allianz, German insurance giant 2007-2010
- President of three foundations promoting research & sustainability

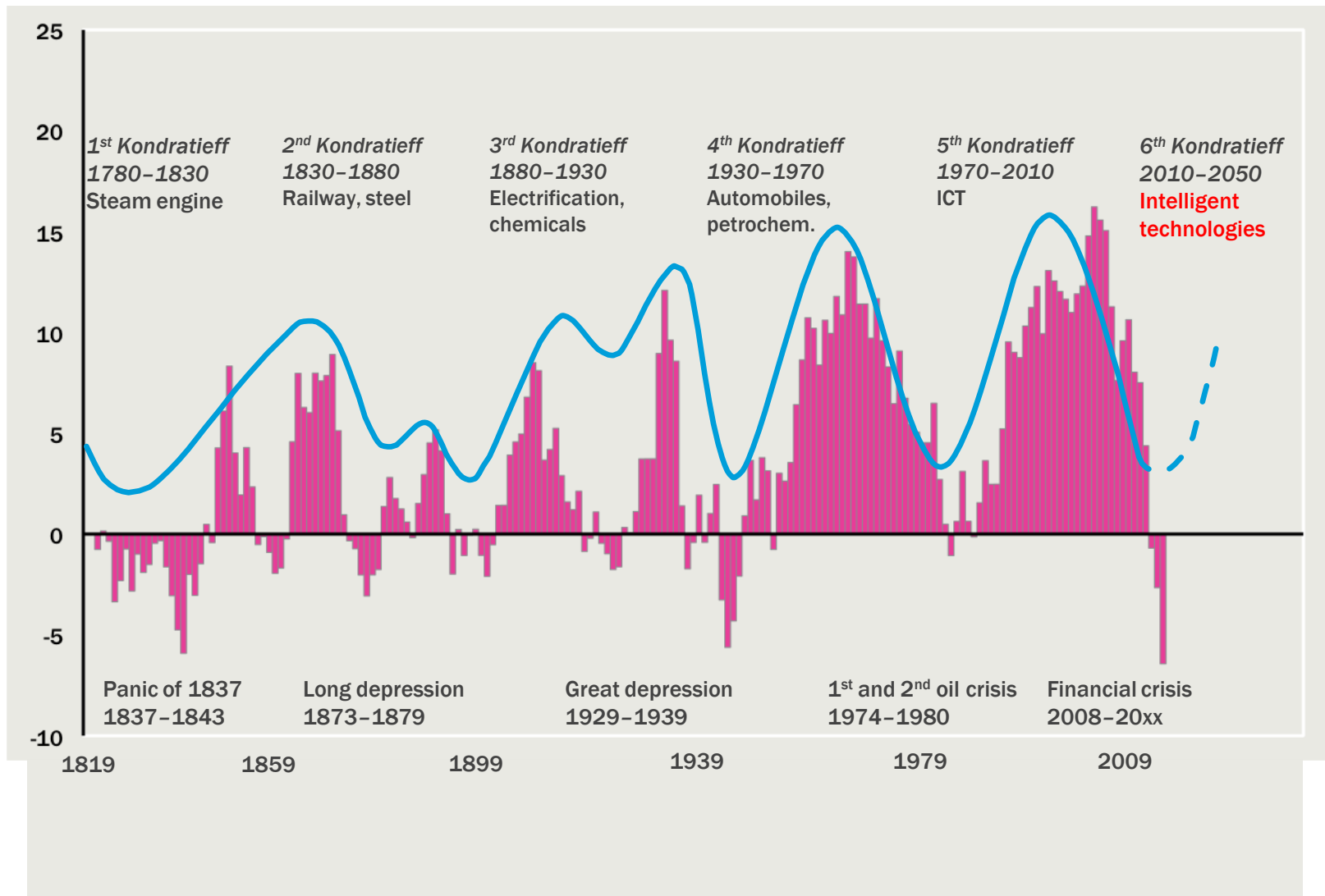


**Current research: how world is about to change in the next 40 years?**

# My topics

- K-waves defining next 40 years
- Some findings from EU-project ecoinnovation observatory
- Current work in Finland on Society's commitment to sustainability

# This is our panoramic perspective: Modern economies fluctuate in a cycle of 40-60 years



Rolling 10-year return on the S&P 500 since 1814 till March 2009 (in %, p. a.). Source: Datastream, Illustration: Allianz Global Investors Capital Market Analysis

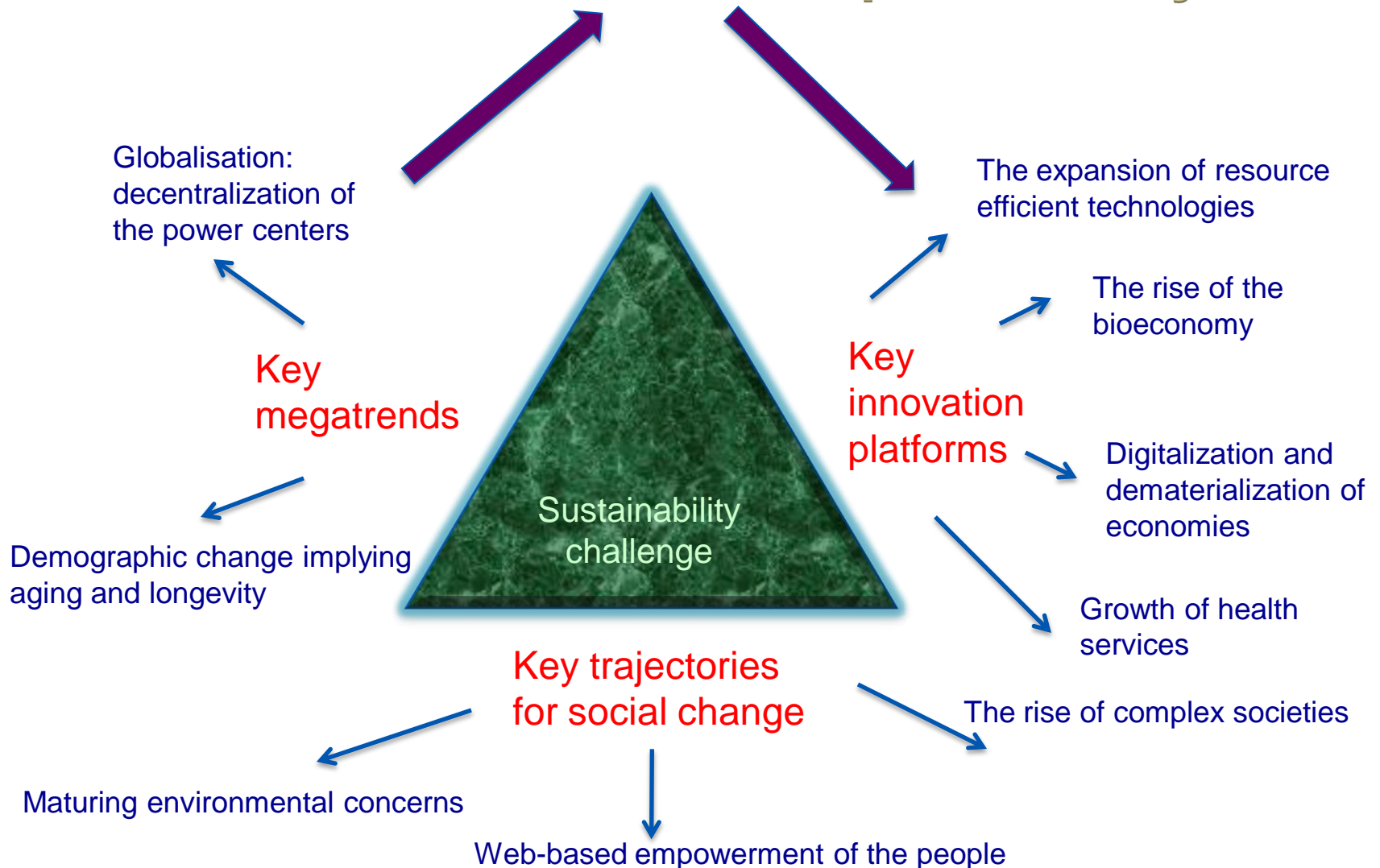
# The succession of development waves in industrial societies

| K-Waves                           | 1 Wave            | 2 Wave         | 3 Wave                | 4 Wave                        | 5 Wave                                      | 6 Wave   |
|-----------------------------------|-------------------|----------------|-----------------------|-------------------------------|---|--|
| <b>Period</b>                     | 1780-1830         | 1830-1880      | 1880-1930             | 1930-1970                     | 1970-2010                                   | 2010-2050  |
| <b>Drivers</b>                    | Steam Machine     | Railroad Steel | Electricity Chemicals | Auto-mobiles, Petro-chemicals | ICT   | Intelligent, resource efficient technologies     |
| <b>Prime field of application</b> | Clothing industry | Transport      | Mass-production       | Personal mobility             | Production and communication of information | Materials and energy production and distribution |



# The drivers behind 6th Wave (2010-2050)

## The search for resource productivity



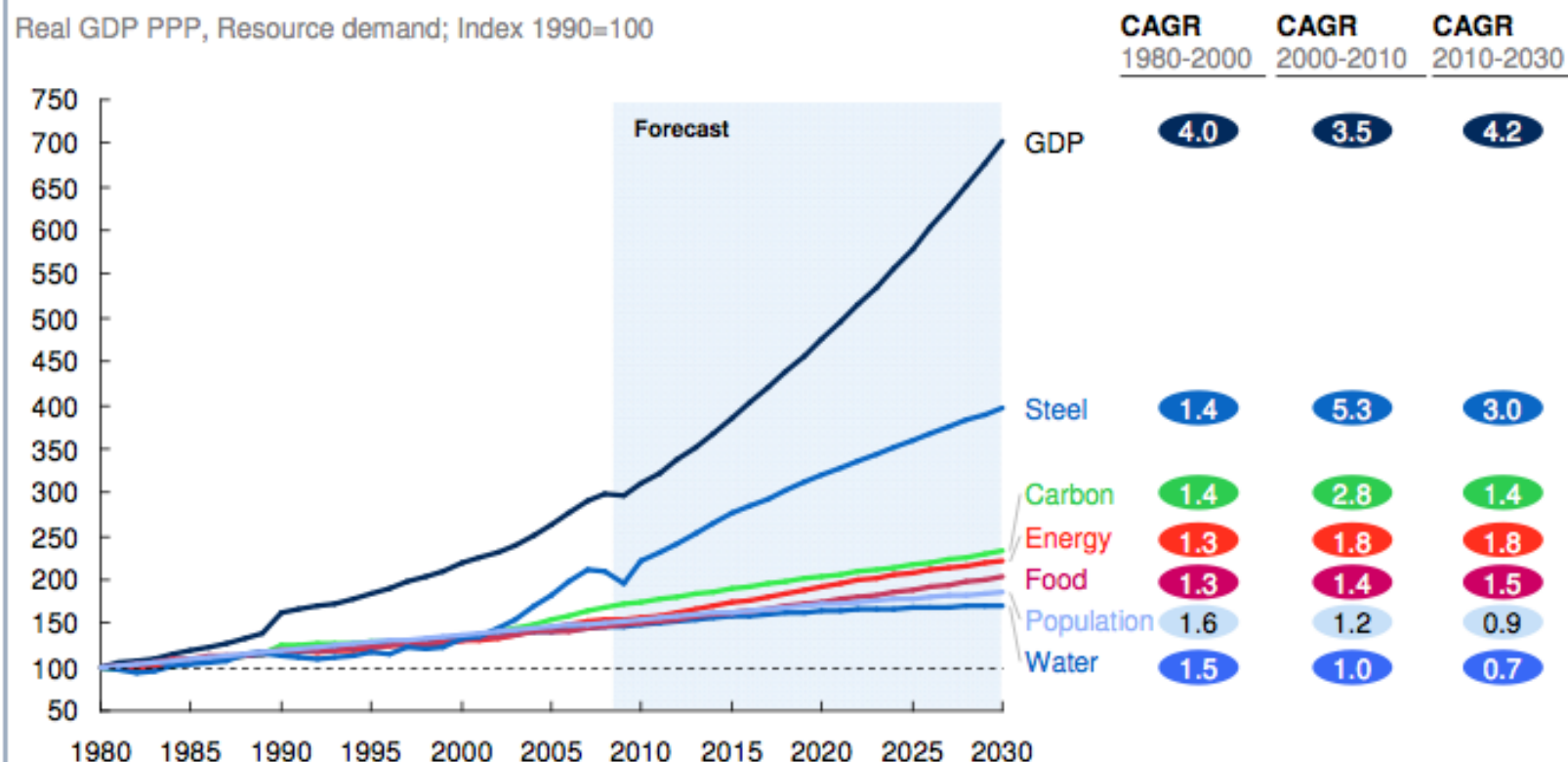
Why resource productivity is  
the most important driving  
force for the next wave?

## Evidence from the recent past...

### Demand for many resources has experienced increasing growth since 2000

#### Resource demand has been relatively de-coupling from GDP growth

Real GDP PPP, Resource demand; Index 1990=100



Note: The underlying units are: Real GDP PPP (US\$ Trillion); Carbon (MtCO<sub>2</sub>e); Energy (QBTU); Water (Km<sup>3</sup>); Food and Steel ('000 Tonnes);

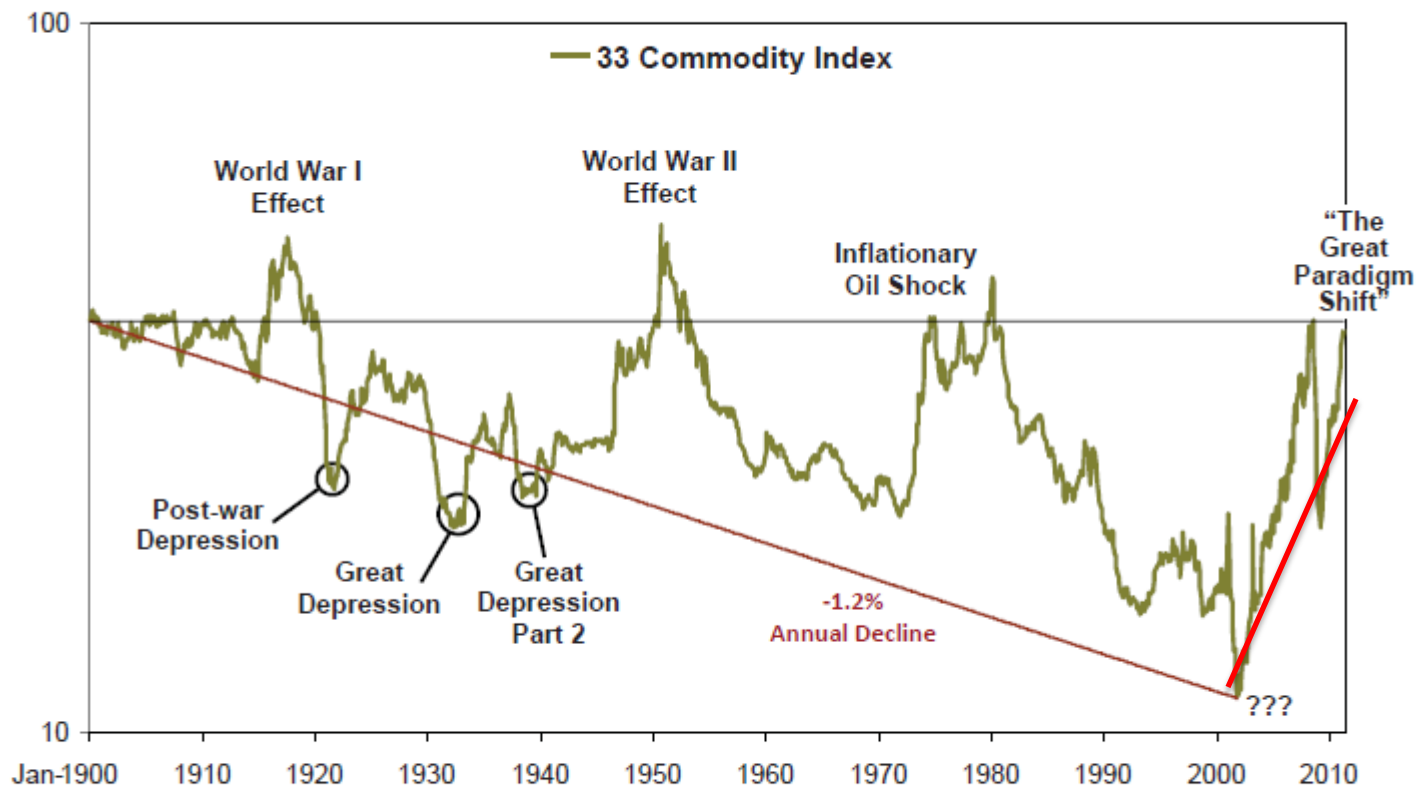
SOURCE: Global insight; IEA; Enerdata (for future growth rates); CAIT; McKinsey Carbon Cost Curve 2.1 (for future growth rate);  
UNEP McKinsey water model; FAOStats; McKinsey Food Model (for future growth rate); WSA; McKinsey Steel model



# Trend-like surge of prices among raw materials, commodities and energy...

## Exhibit 2

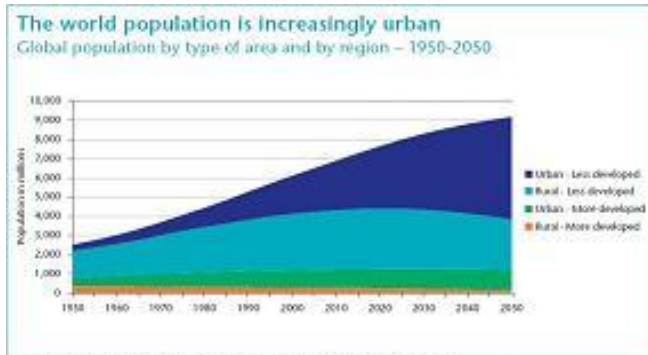
### GMO Commodity Index: The Great Paradigm Shift



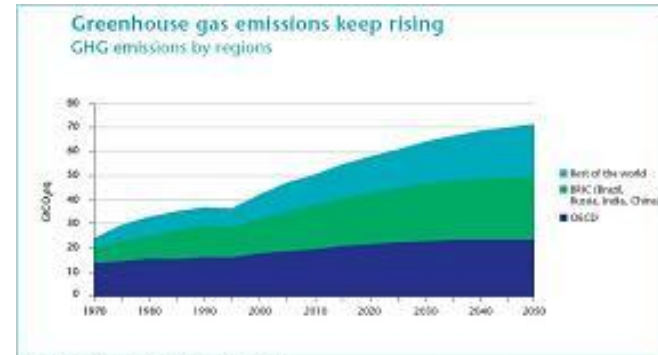
Note: The GMO commodity index is an index comprised of the following 33 commodities, equally weighted at initiation: aluminum, coal, coconut oil, coffee, copper, corn, cotton, diammonium phosphate, flaxseed, gold, iron ore, jute, lard, lead, natural gas, nickel, oil, palladium, palm oil, pepper, platinum, plywood, rubber, silver, sorghum, soybeans, sugar, tin, tobacco, uranium, wheat, wool, zinc.

Source: GMO As of 2/28/11

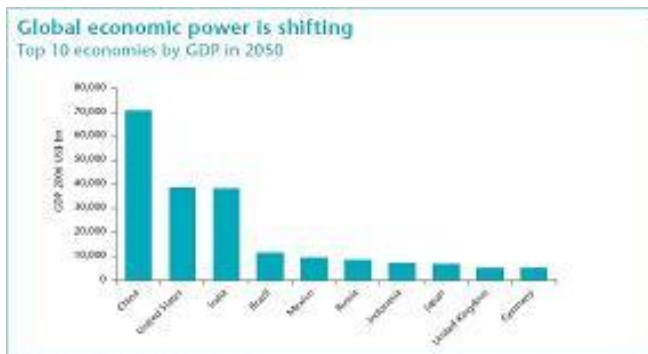
# A complex mixture of developments and trends...



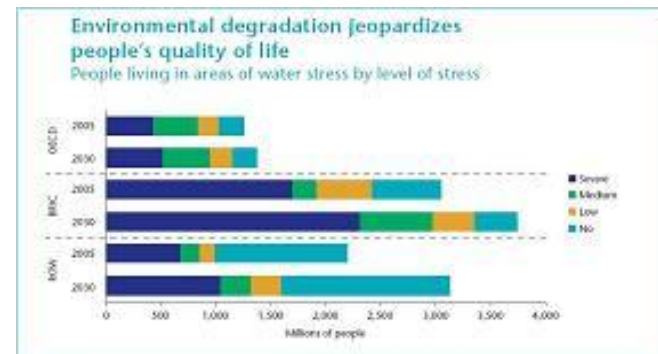
Source: UN Population Division, World Population Prospects: The 2008 Revision, 2008



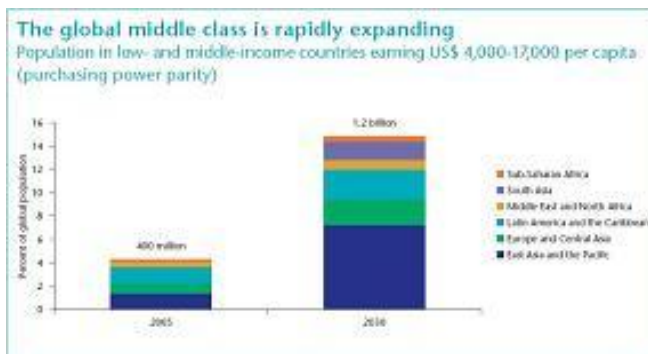
Source: OECD, Environmental Outlook to 2050, 2006



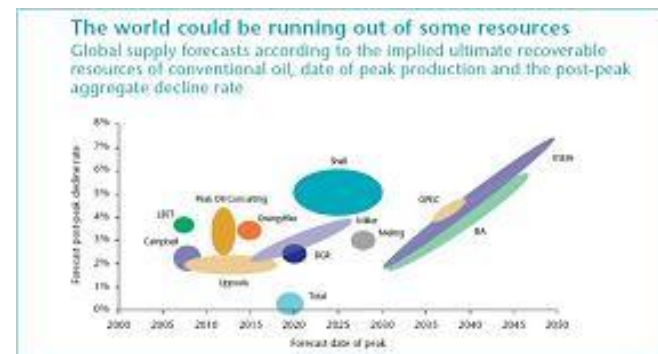
Source: Goldman Sachs, BRICs and Beyond, 2007



Source: OECD, Environmental Outlook to 2050, 2006



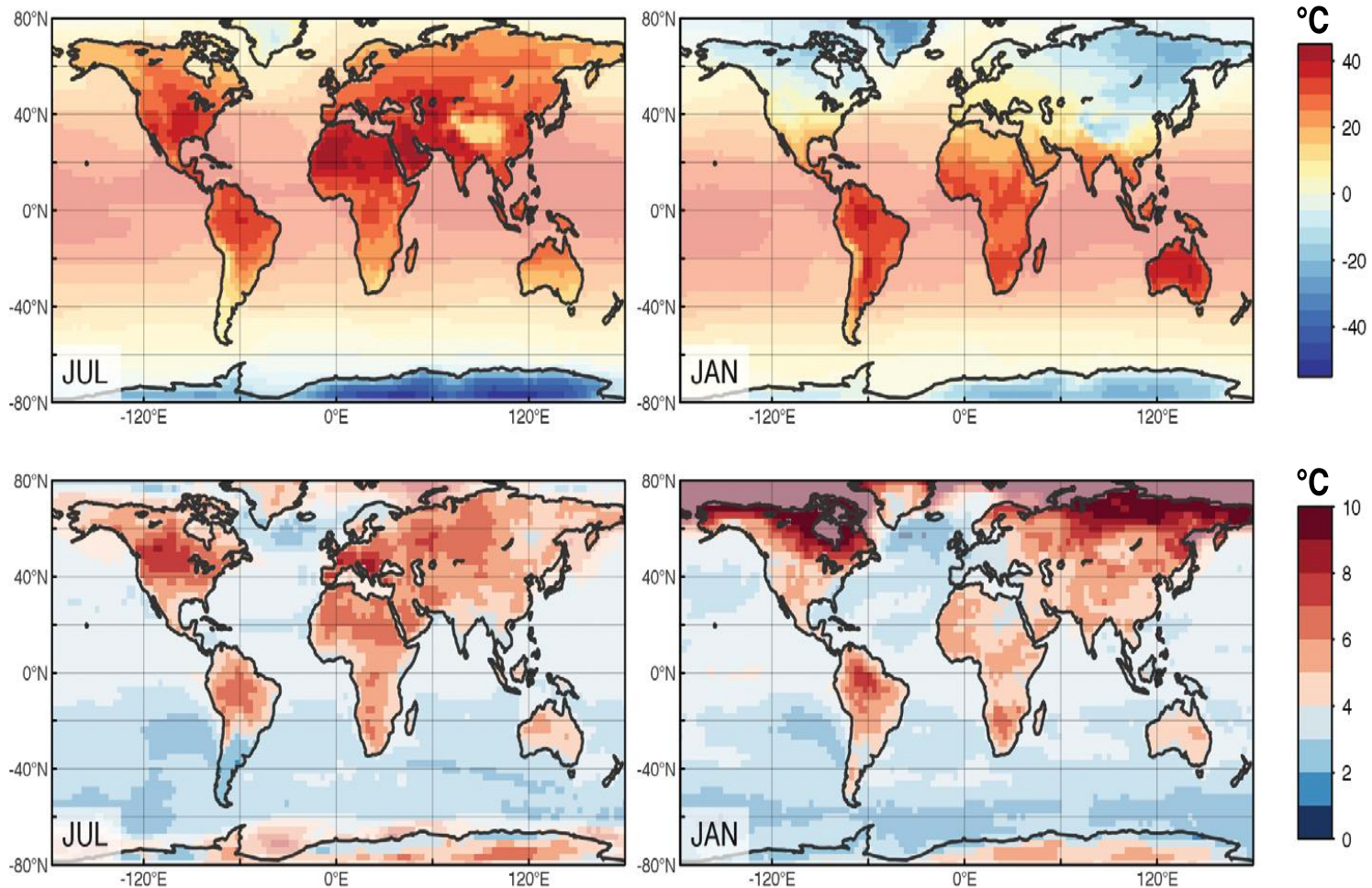
Source: World Bank, Global Economic Prospects, 2007



Source: IEA, The Global Oil Depletion Report, 2009

## +Dramatic results of a recent report by PIK/World Bank...

**Figure 2:** Multi-model mean compilation of the most extreme warm monthly temperature experienced at each location in the period 2080-2100 for the months of July (left) and January (right) in absolute temperatures (top) and anomalies compared to the most extreme monthly temperature simulated during present day (bottom). The intensity of the color scale has been reduced over the oceans for distinction.



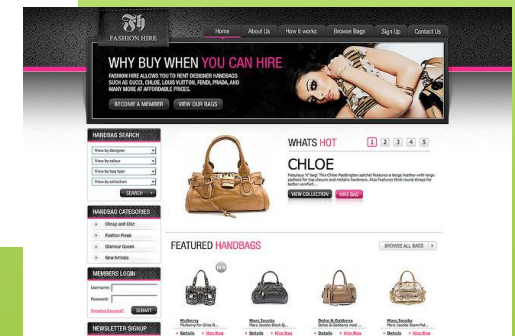
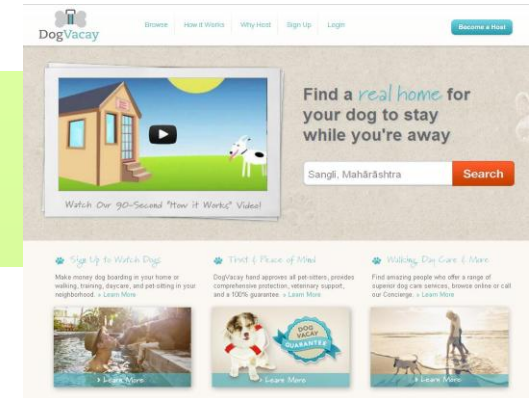
## My humble prediction:



Everything that is produced with non-renewables will be produced with renewables...

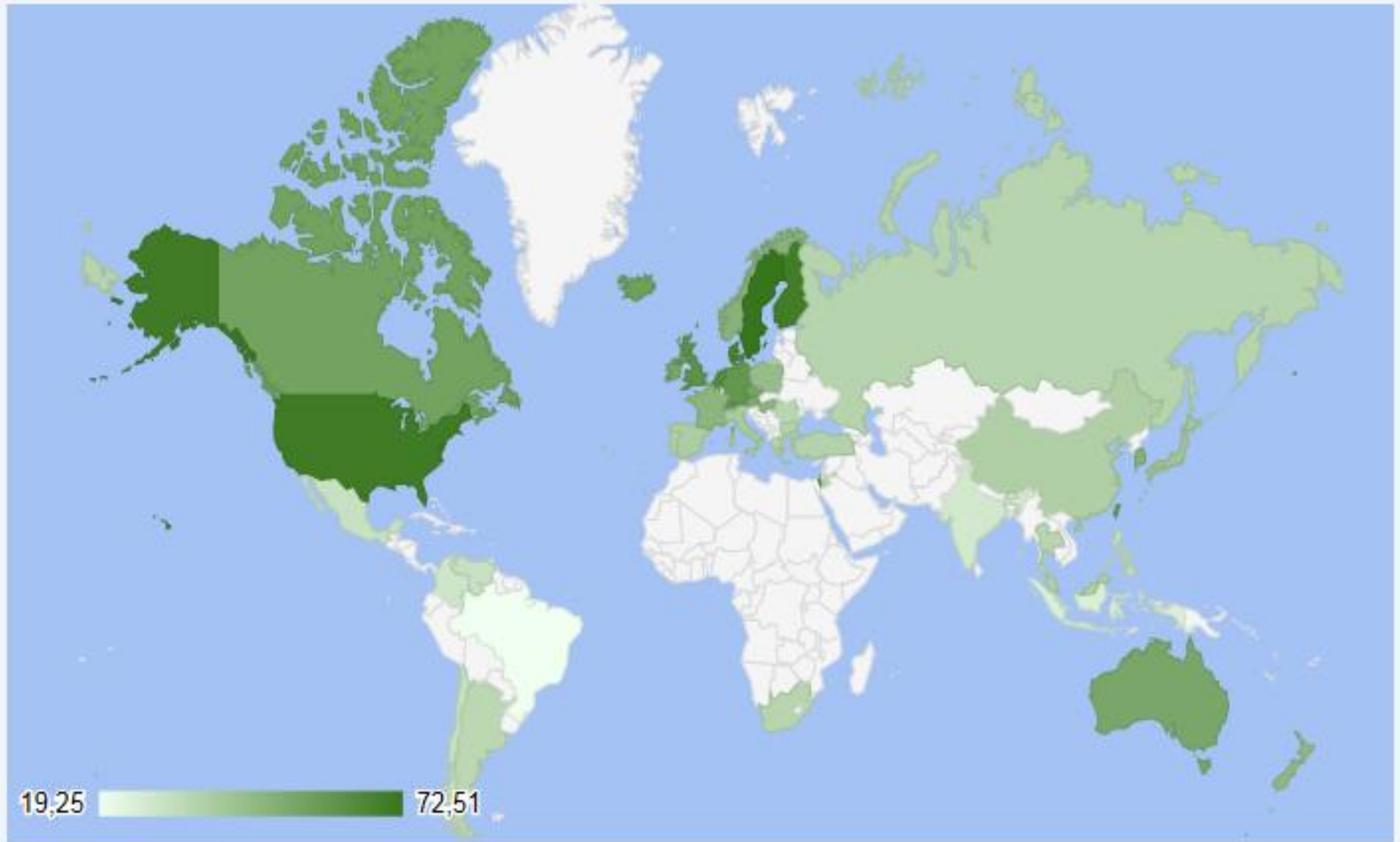


# How to use resources smarter? Sharing economy is on its way....



# The role of intellectual capital becomes crucial

**Active Map:** Overall National IC, NIC, percentage share in GDP formation 2011





Eco-innovation is any innovation that reduces the use of natural resources (including materials, energy, water, biomass and land) and decreases the release of harmful substances across the whole life-cycle.



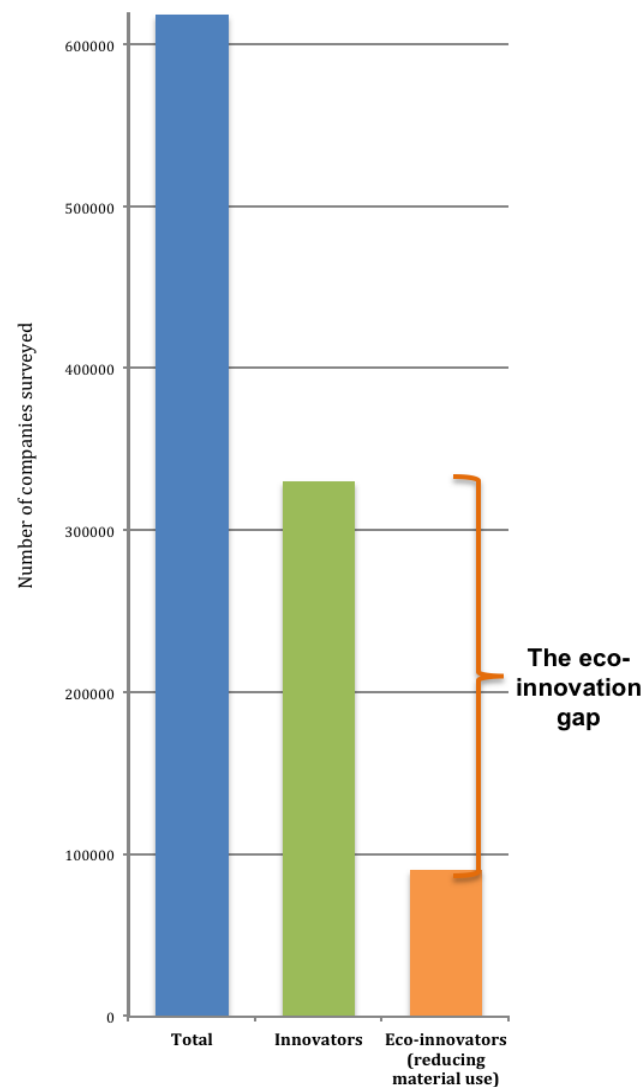
# The most thorough research project on the resource efficiency

- Reports and briefs
- EU27 country profiles
- Database with on-line charts and maps
- 150+ good practices
- Eco-innovation glossary
- Surveys



<http://www.eco-innovation.eu>

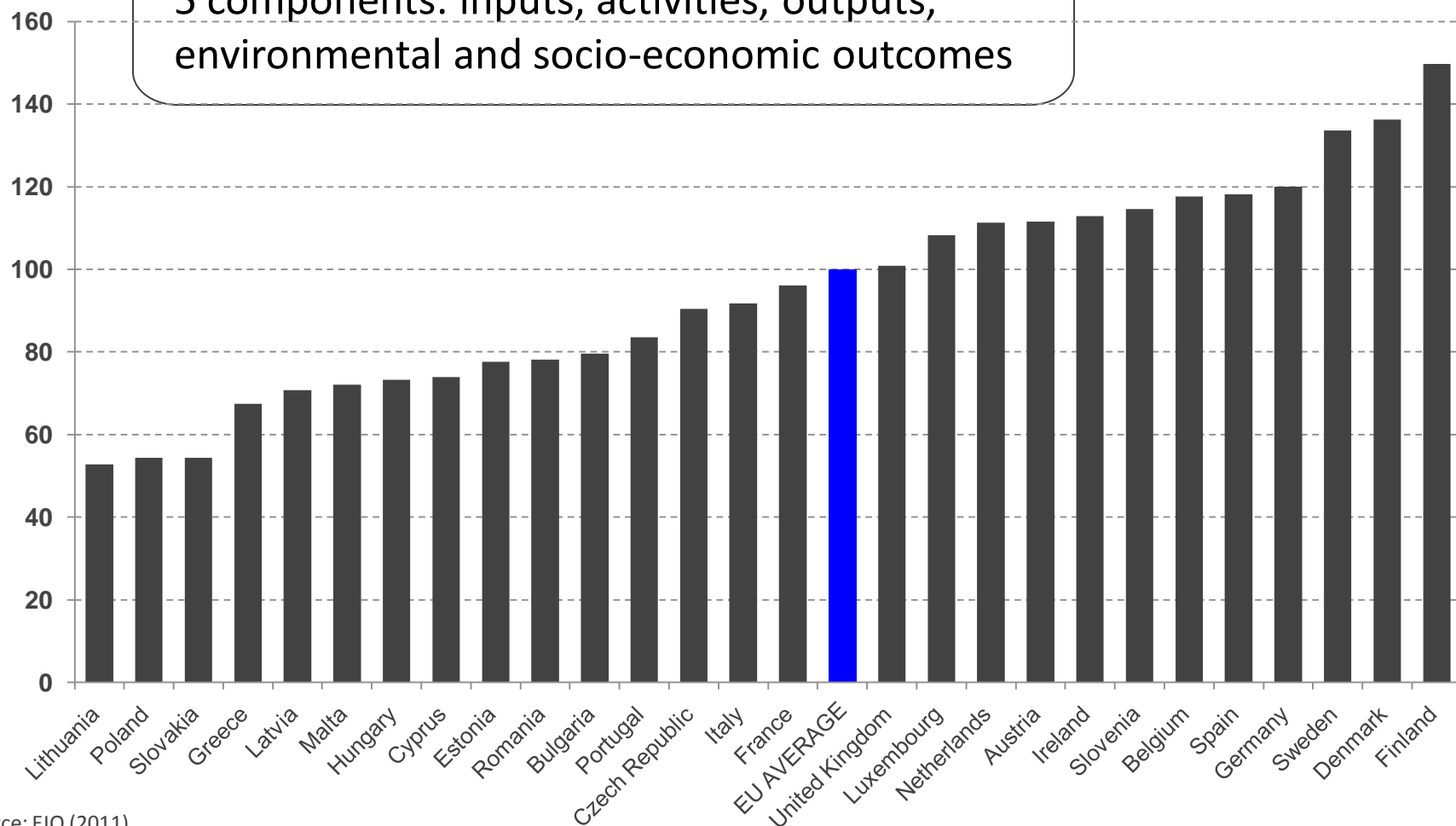
Many European companies implement eco-innovation, but the majority either still do not eco-innovate or the material savings achieved due to innovation are relatively low.

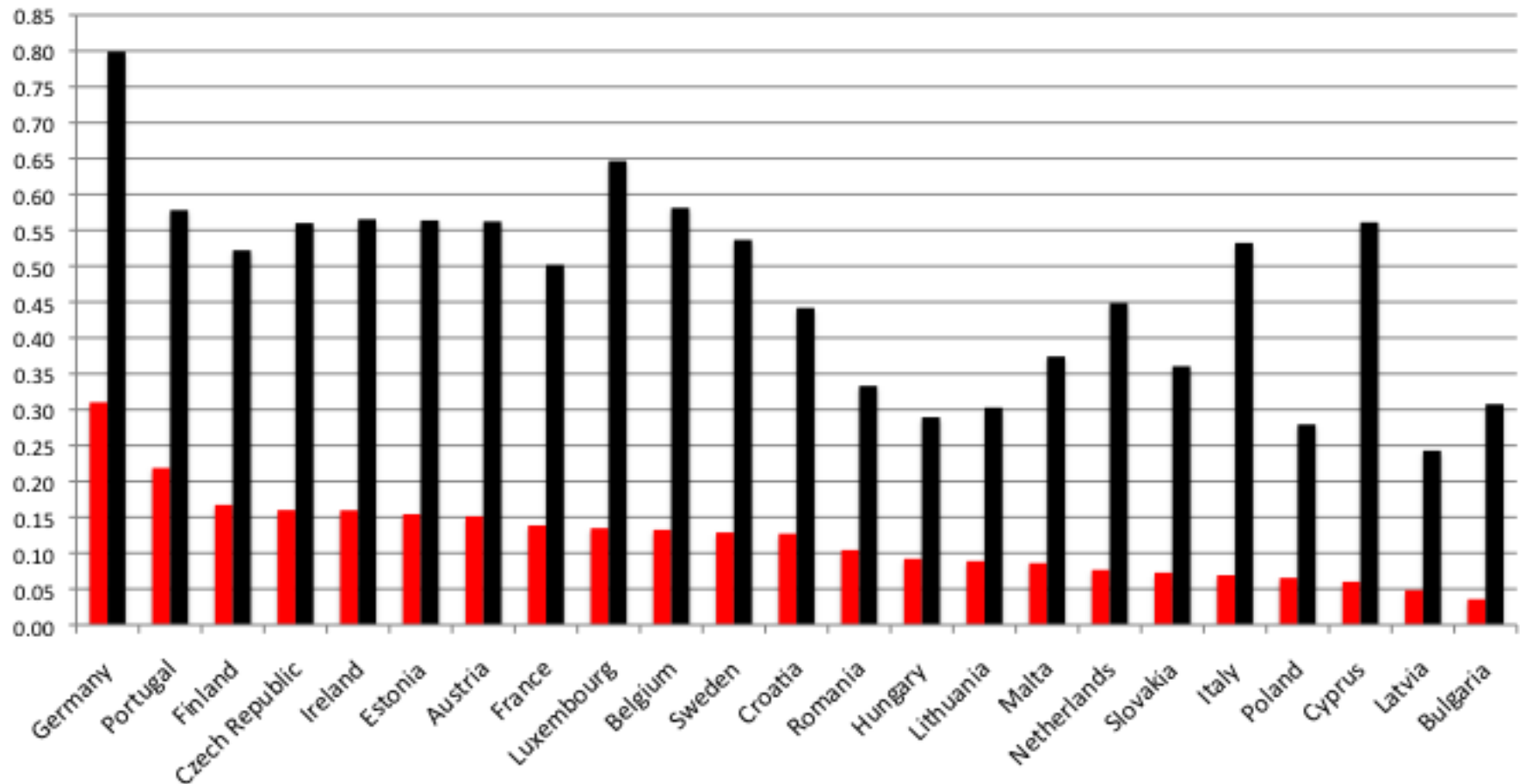


## Eco-innovation scoreboard 2012

16 indicators (8 data sources)

5 components: inputs, activities, outputs,  
environmental and socio-economic outcomes





Share of **firms reporting reduced material use** per unit of output as a result of innovation (red) and firms with any innovation activity (black) (CIS 2008)

- Eco-innovation recognised in political and policy debates across the EU, but not an over-arching concept guiding policy and regulatory frameworks
- Major focus of public support for eco-innovation on environmental technologies or “eco-industries”
- The importance of resource efficiency on the rise in most EU MS, but rarely linked to innovation
- Promoting “systemic innovation” rare and reported only in few countries and regions.



- Current EU eco-innovation policies not likely to lead to a major shift towards “green economy”
- Main challenges for public policy remain:
  - To apply ambitious sustainability criteria to all governmental expenditures
  - To use regulation and fiscal measures to get the true price of resource use
  - To find a good balance between support to incremental changes in industry and more radical and systemic eco-innovations
  - To link up relevant stakeholders in a coherent policy



# Society's Commitment to Sustainability Case Finland

2012

Formulation of a new strategy begins

Preparatory workshops (4) for stakeholders

Assessment of the national model and work of the [Finnish National Commission on Sustainable Development \(FNCSD\)](#)

Decision on 'society's commitment to sustainability'

2013

Enquiries and workshop for interest groups & stakeholders

Strategy group established to formulate the national concept of 'society's commitment to sustainability'

New set of indicators, measuring the commitment  
June 2013

Work of the strategy group ready, i.e. proposal for 'society's commitment to sustainability', June 2013

Proposal discussed and approved by the [Finnish National Commission on Sustainable Development \(FNCSD\)](#), Sept. 2013

Independent committee of science will be established?

Interest groups, stakeholders (companies, municipalities, government (ministries, administrative bodies), NGOs, etc.) make commitments 2013-> process

Society's commitment to sustainability is "approved" by the government and a resolution is issued, Dec. 2013

2014->



# Commitment paper: targets & goals

- Most important points in the "paper"
- Goals focus on "survival" & essential issues
- Only a few (5-7)
- Measurable
- Time scale up to 2050
  - **Visionary but concrete!**
- Ambitious



# How to sell the commitment?

- Companies
- Public organisations
  - NGOs, municipalities, student organisations
- Government
- Citizens (through NGOs)



If you are more interested in what I have to say:

Markku Wilenius and Sofi Kurki

## SURFING THE SIXTH WAVE

Exploring the next 40 years of global change



[http://www.utu.fi/fi/yksikot/ffrc/julkaisut/e-tutu/Documents/eBook\\_2012-10.pdf](http://www.utu.fi/fi/yksikot/ffrc/julkaisut/e-tutu/Documents/eBook_2012-10.pdf)

FINLAND FUTURES RESEARCH CENTRE  
FFRC eBook 10/2012



# Thank you for your attention

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