



# *Incremental Change or Paradigm Shift?*

## *The Necessity and Possibility of Reducing our Footprint*

Presentation at the European Environment Bureau  
40<sup>th</sup> Anniversary Conference

**"Europe at the Crossroads: The Challenge of  
Environmental Sustainability"**

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# 1. My Fear

The first quarter of the 21st century could go down in history as the point in time, when humankind sacrificed the possibility for a decent life of future generations

**We have to ACT NOW!**

*I still see a window of opportunity*

*Climate trend projection*





There were already pictures I presented at the 2008 EEB AGM.

But the story goes on, with no turnaround in sight.

And since 2014 we know that the date of last opportunity to avoid irreversible damage has passed into history.





**Due to climate change and management failures, agrobiodiversity and food security are threatened from typhoons...**



Luzon 2009



**...or from frequent inland flooding**





**“Today we present observational evidence that a large section of the West Antarctic Ice Sheet has gone into irreversible retreat. It has passed the point of no return,”**

Eric Rignot, NASA Jet Propulsion  
Laboratory, May 2014

**“One of the feared tipping points of the climate system appears to have been crossed.”**

Stefan Rahmstorf, PIK





## 3. The future

**“Western Antarctic ice sheet collapse has already begun, scientists warn. Two separate studies confirm loss of ice sheet is inevitable, and will cause up to 4m of additional sea-level rise”**

**'Collapse will change the coastline of the whole world'**





Under the worst-case scenario currently envisaged, the collapse of the entire ice sheet is about 200 years off, but ‘we have evidence from prehistoric warm periods that this could occur over decades. At this point we don’t know long it will take, but we do know that the climate forcing today is much stronger than at any time in over 50 million years.’







The first tipping point has been past, the day of last opportunity is history.

The time for precaution is over, **we have to adapt, like it or not.**

Paris 2015 is looming, less than a year away.

Now, you ask “will it be enough to step up incremental change or should we be looking for a paradigm shift?”

**A game change has happened, but we seem to have problems realising it!!**





**Wetlands, rainforests, deserts and iconic species are at risk, globally**





**4. It's time for change,  
time for sustainable development.**



# OUR COMMON FUTURE

THE WORLD COMMISSION

ON ENVIRONMENT

AND DEVELOPMENT



print

Sustainable Europe  
Research Institute



**“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts two key concepts: ...**





## The necessity & possibility of reducing our footprint

*(definition cont.)*

1. **The concept of ‘needs’**, in particular the essential needs of the world’s poor, to which overriding priority should be given, and
2. **The idea of limitations** imposed by the state of technology and social organisation on the environment’s ability to meet present and future needs.”

(WCED 1987, p.43)



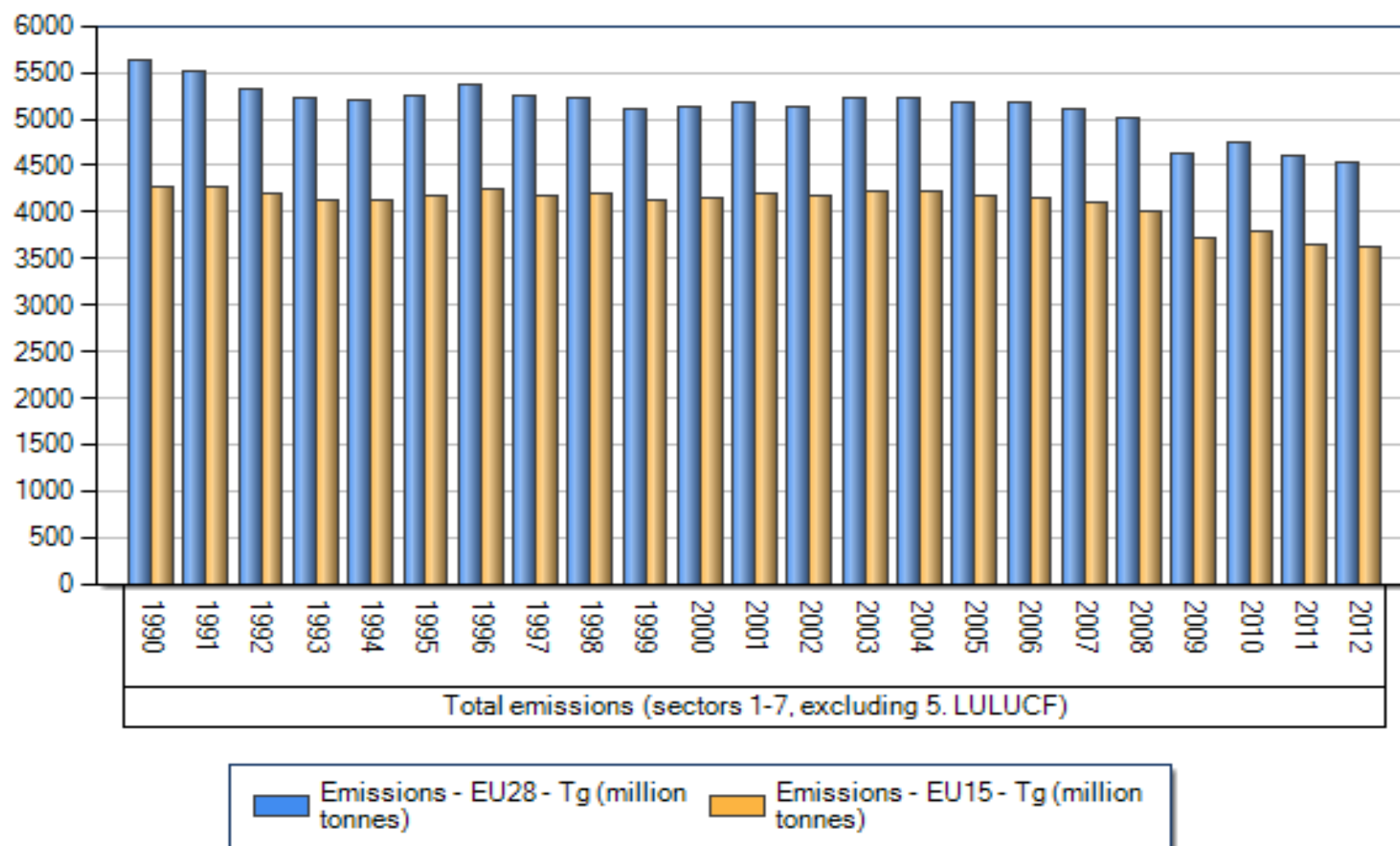


# Environmental Space: Factor 5/Factor 10, cultural diversity and poverty eradication





## 5. Europe has delivered, but too little, too late, and not sustained







# Innovation, technical & social, is great – but not enough







**Innovative environmental technologies combine emission reduction and recycling:**

**A great idea which hasn't solved the problems yet.**

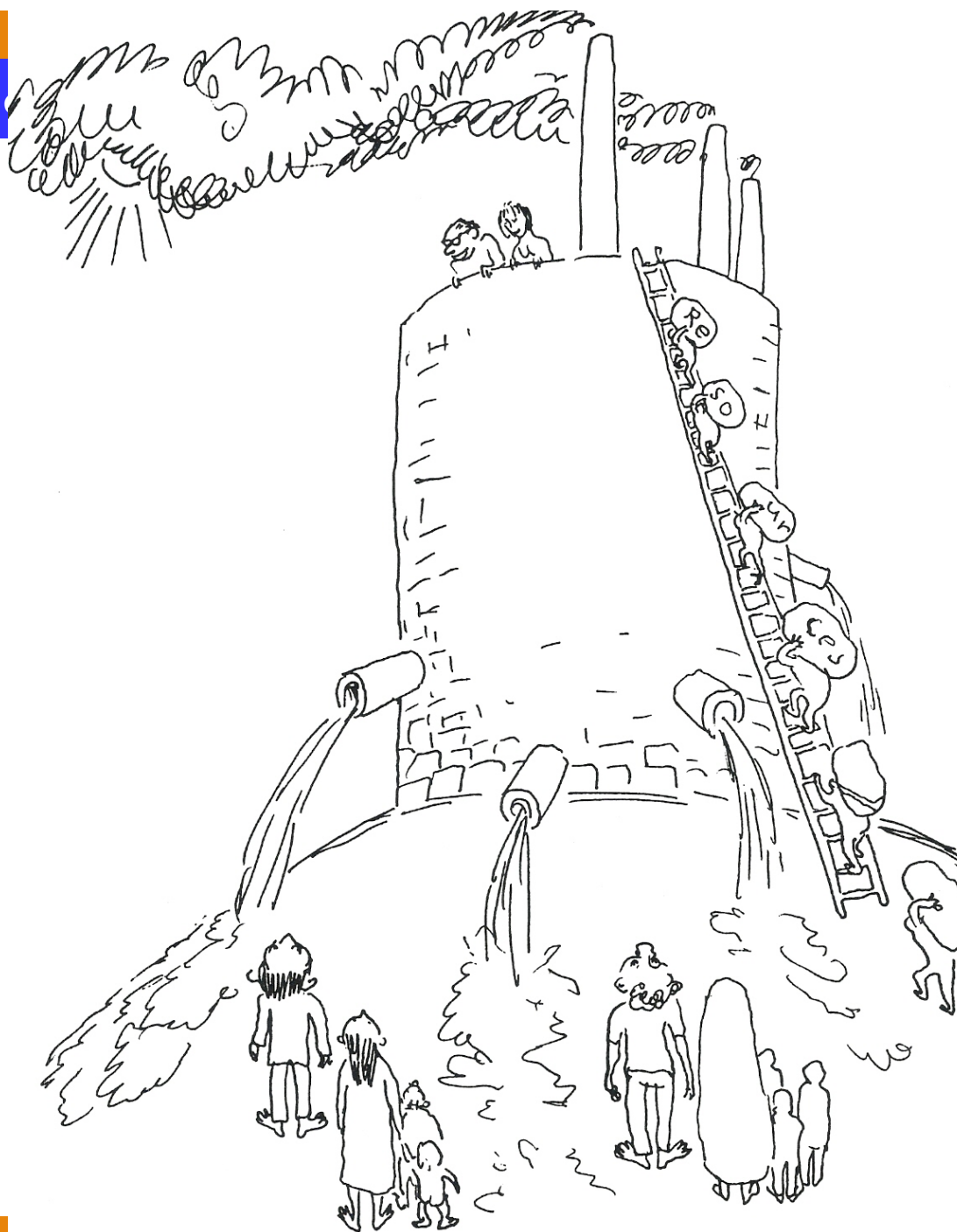
Metal dust recovery system, enforced by regional kings „to avoid damage to neighbouring fields and grazing grounds”.

Source: Agricola, G. (1556). De re metallica



**Resource  
efficiency means  
less demand, less  
supply conflicts,  
similar services,  
less waste and  
pollution, and  
often more jobs:**

**What will the new  
Commission do?**





## But: for decreasing resource consumption, efficiency is not enough

What we need is **absolute decoupling** of economic development and resource consumption, not a relative one with increasing emissions and waste generation.

- ✓ **Rebound effect:** The money saved through efficiency (win-win solutions) is spent, consuming resources and compensating (part of) the efficiency gains.
- ✓ **Jevons' Paradox:** Efficiency decreases the relative cost of a resource, generating incentives to use more of it, and it stimulates growth and thus resource use.

Σ **Conclusion: Efficiency without skimming off (part of) the gains may lead to perverse outcomes.**







**It's not about doing things better,  
but about doing better things**

**Suboptimisation is no solution**

**(i.e. doing in the best possible way things  
that should not be done at all)**







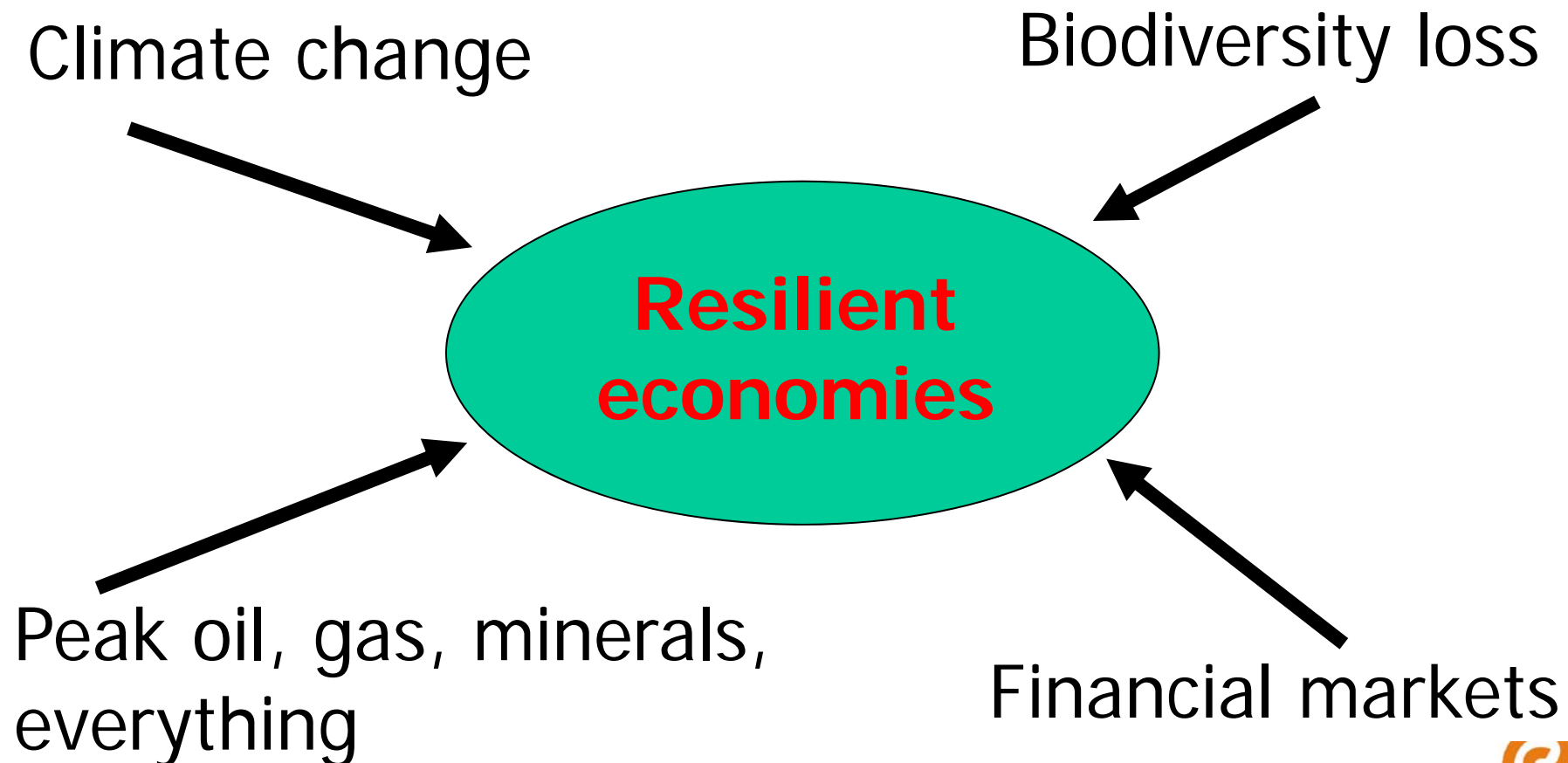
The necessity & possibility of reducing our footprint

Besides innovation,  
*ex-novation*  
is urgently needed.





# A sustainable economy must be capable to deal with all these challenges





# Increase resource use efficiency

$$\frac{\text{Consumer satisfaction}}{\text{Services consumed}} \times \frac{\text{Services consumed}}{\text{Services generated}} \times$$

$$\frac{\text{Services generated}}{\text{Physical input}} \times \frac{\text{Physical input}}{\text{Resources activated}} =$$

$$\text{Satisfaction efficiency} \times \text{supply efficiency} \times \text{production efficiency} \times \text{provision efficiency} =$$

$$\text{Consumer satisfaction} / \text{resources activated}$$



## Economic Sustainability

“Sustained and sustainable growth”: criteria in a nutshell:

**Reducing Resource Consumption:  $d(R) < 0$**

if resource productivity  $Y/R$  grows faster than the economy  $Y$

$$(1) \quad d(Y/R) > d(Y)$$

**Creating Additional Jobs:  $d(L) > 0$**

if per capita production  $Y/L$  grows slower than the economy  $Y$

$$(2) \quad d(Y/L) < d(Y)$$

combining (1) and (2)

## The Inequality of Sustainability

$$(3) \quad d(Y/L) < d(Y) < d(Y/R)$$





The necessity & possibility of reducing our footprint

**Of course efficiency,  
circular economy,  
and renewable  
resources offer a  
potential reduction:**

**Maybe by a factor 4 to 5, i.e.  
exactly what 3% growth will  
eliminate by 2050...**





*Thank you for your attention!*

*For this and similar presentations, papers,  
and more, see*

*<http://seri.academia.edu/JoachimHSpangenberg>*