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A Presentation to the Ellen MacArthur Foundation's
Disruptive Innovation Festival by

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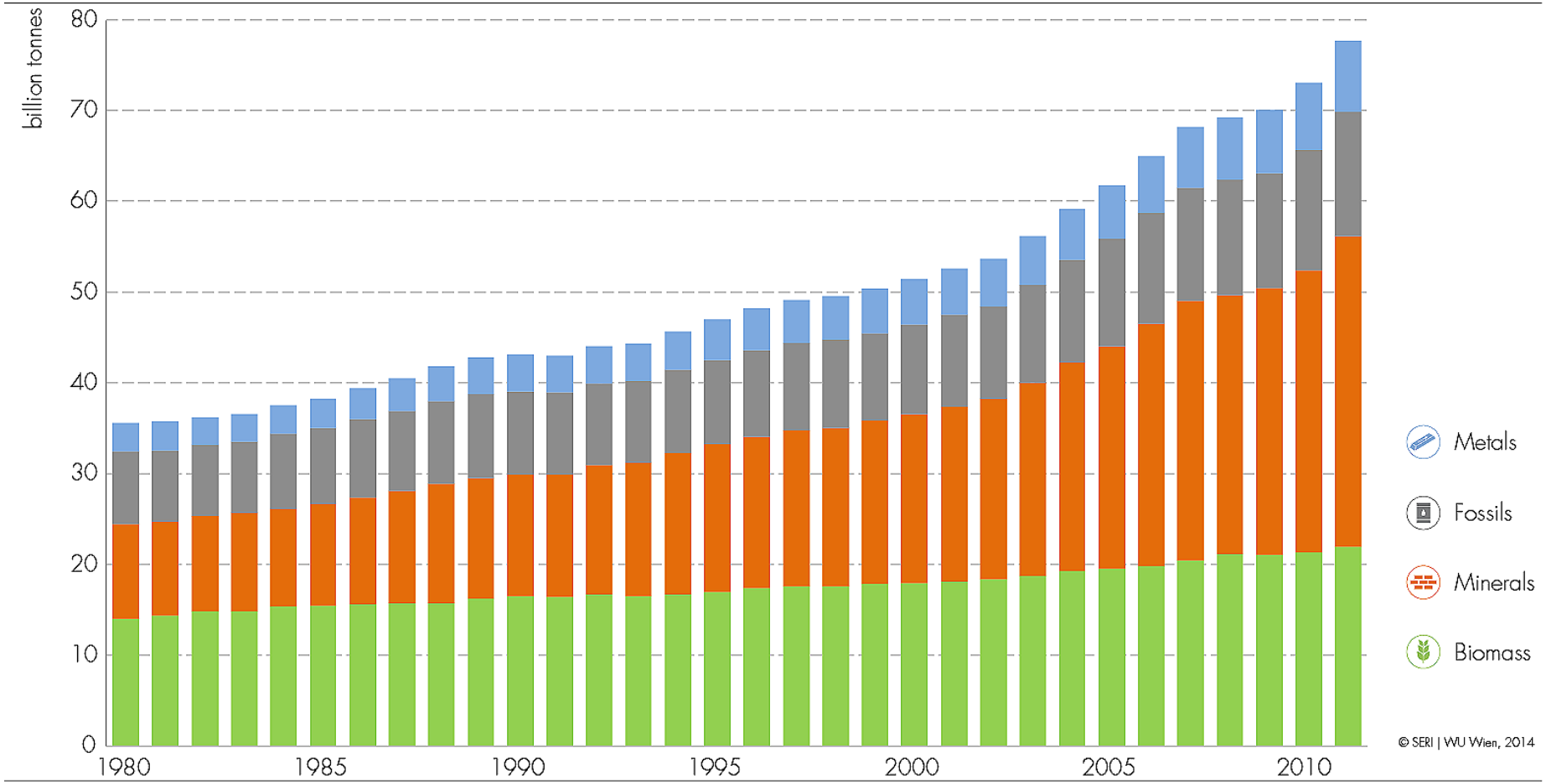
November 11th 2015

London

Resource efficiency: Why?

Increased population, growing middle class consumption, increased extraction



Global extraction of used materials

Source: www.materialflows.net

Resource efficiency: Why?

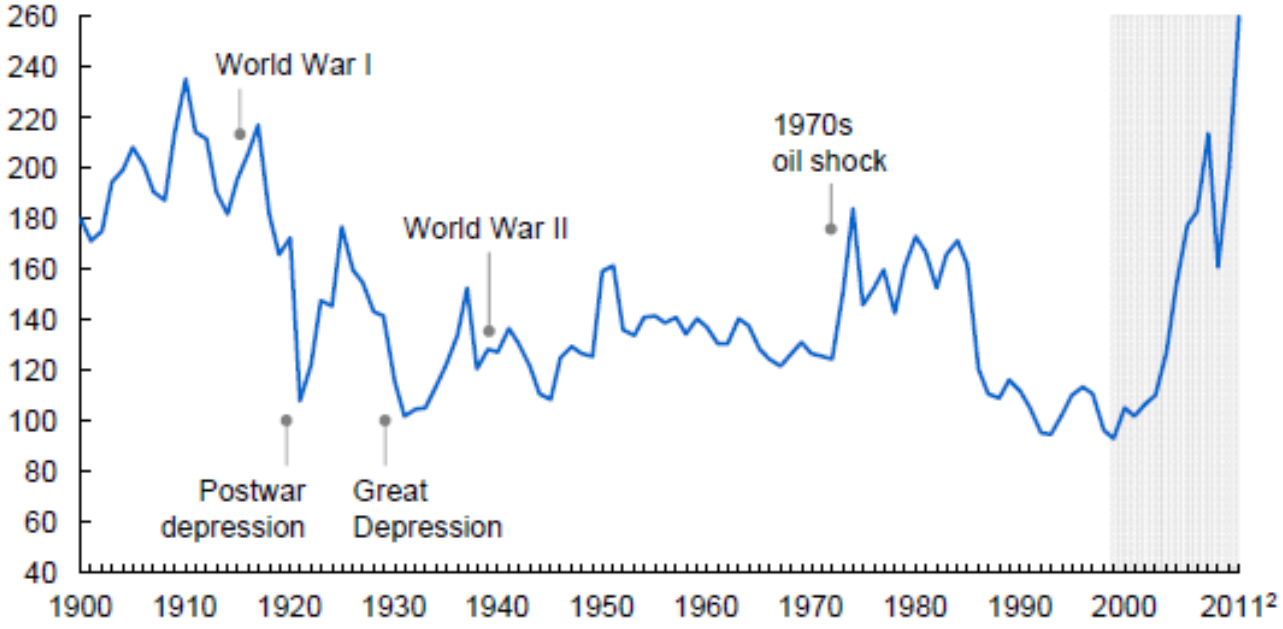
Increased and volatile prices

Source: McKinsey Global Institute 2011 *Resource Revolution*

Exhibit E1

Commodity prices have increased sharply since 2000, erasing all the declines of the 20th century

MGI Commodity Price Index (years 1999–2001 = 100)[1]



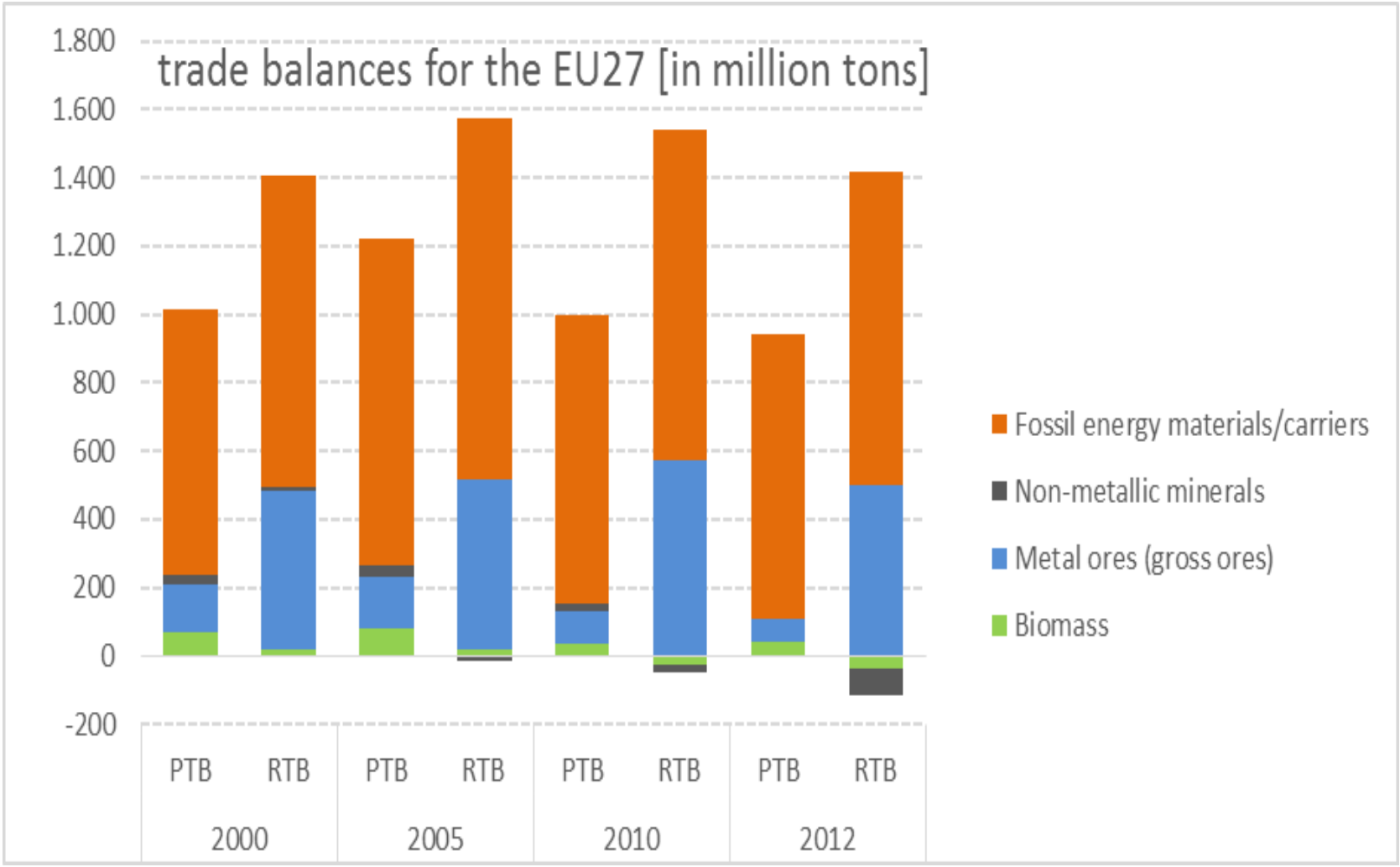
1 See the methodology appendix for details of the MGI Commodity Price Index.

2 2011 prices are based on average of the first eight months of 2011.

SOURCE: Grilli and Yang; Stephan Pfaffenzeller; World Bank; International Monetary Fund (IMF); Organisation for Economic Co-operation and Development (OECD); UN Food and Agriculture Organization (FAO); UN Comtrade; McKinsey analysis

Resource efficiency: Why?

EU 27 imports: physical trade balance (PTB) and raw material trade balance (RTB)
Source: UNEP IRP 2015 (forthcoming) *International Trade in Resources: A biophysical assessment*

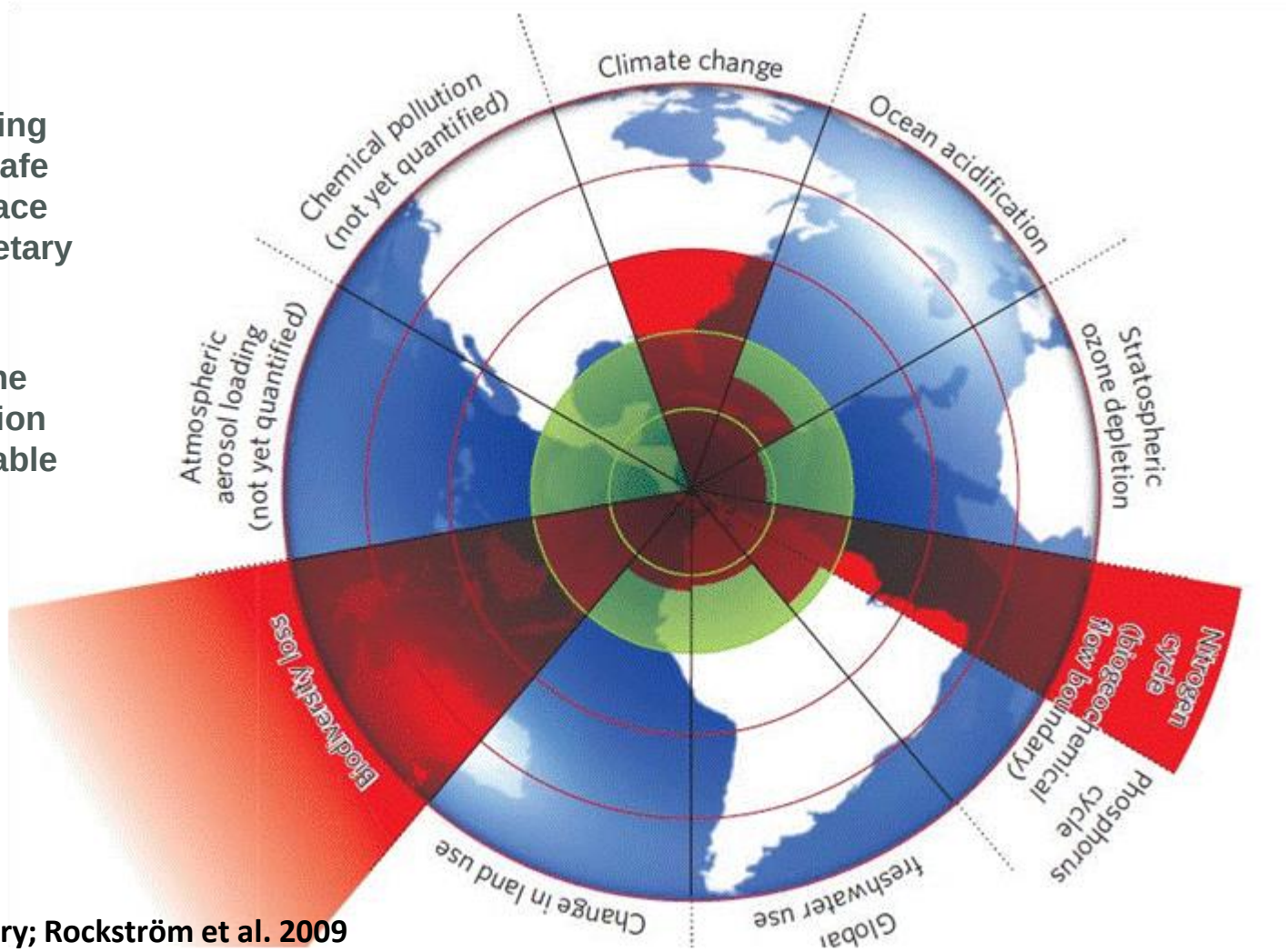


Resource efficiency: Why?

Increasingly risky environmental impacts

inner green shading
= proposed safe operating space for nine planetary systems

red wedges =
estimate of the current position for each variable

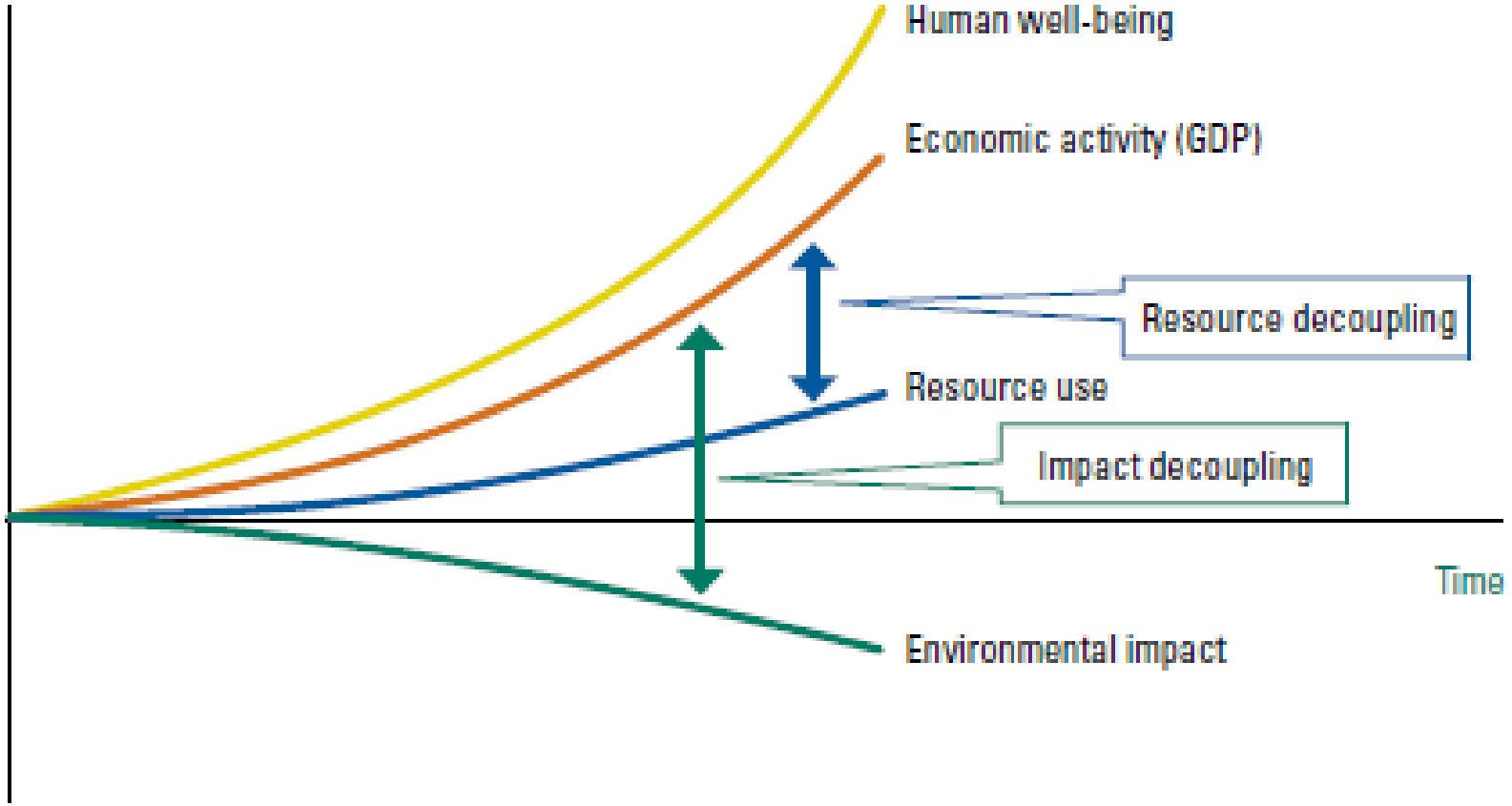


Beyond the boundary; Rockström et al. 2009

Resource efficiency: Why?

The imperative of double decoupling

Source: UNEP IRP 2011 *Decoupling Natural Resource Use and Environmental Impacts from Economic Growth*



POLFREE: An Introduction

- European Union Collaborative FP7 Project
- October 2012 until end of March 2016
- 5 work packages:
  - WP1: why have resources been used inefficiently?
  - WP2: new concepts and paradigms for resource efficiency
  - WP3: scenarios and modeling of policy implementation
  - WP4: synthesis, conclusions and engagement
  - WP5: project management

The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 308371

POLFREE: Institutions

- UCL ISR (UK)
- Wuppertal Institute (Germany)
- TNO (Netherlands)
- ICIS, Maastricht University (Netherlands)
- GWS (Germany)
- SERI (Austria)
- PIK (Germany)
- International Synergies (UK)

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POLFREE: Concepts

- Resources:

  The production and use of goods and services is associated with the use of natural resources: water, land and a range of minerals or materials . A common distinction of resources is between fossil fuels (and associated carbon emissions), construction minerals, metallic minerals, biomass, water and land.

- Resource efficiency:

  Increasing resource efficiency involves using a reduced quantity of resources to achieve the same or improved service or output (output/resource input), where both input and output are measured in some physical unit, e.g. km/litres of fuel. It is therefore an output/input measure of technical ability to produce “more from less” (cf resource productivity, about adding value to resources, GDP/RMC)

- Web of constraints:

  Not individual ‘barriers’: need a policy mix response

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POLFREE: The need for policy

- Societal goals for a RE economy
  - World vision and values influencing policy goals
  - Aligning policy goals of competitiveness, resource security and environmental quality
  - Environmental and resource boundaries and constraints
- These goals cannot be adequately pursued only through markets
- Policy needs to guide markets towards a more resource-efficient economy

POLFREE: Aims

- Understand the web of constraints and barriers to resource efficiency
- Identify the concepts, policies and business models that could overcome the barriers, untangle the web of constraints
- Create a vision for and pathways to a resource-efficient Europe
- Identify policy mixes that can promote a resource-efficient economy
- Model scenarios simulating the proposed pathways and policy mixes
- Synthesise and draw policy conclusions from the results

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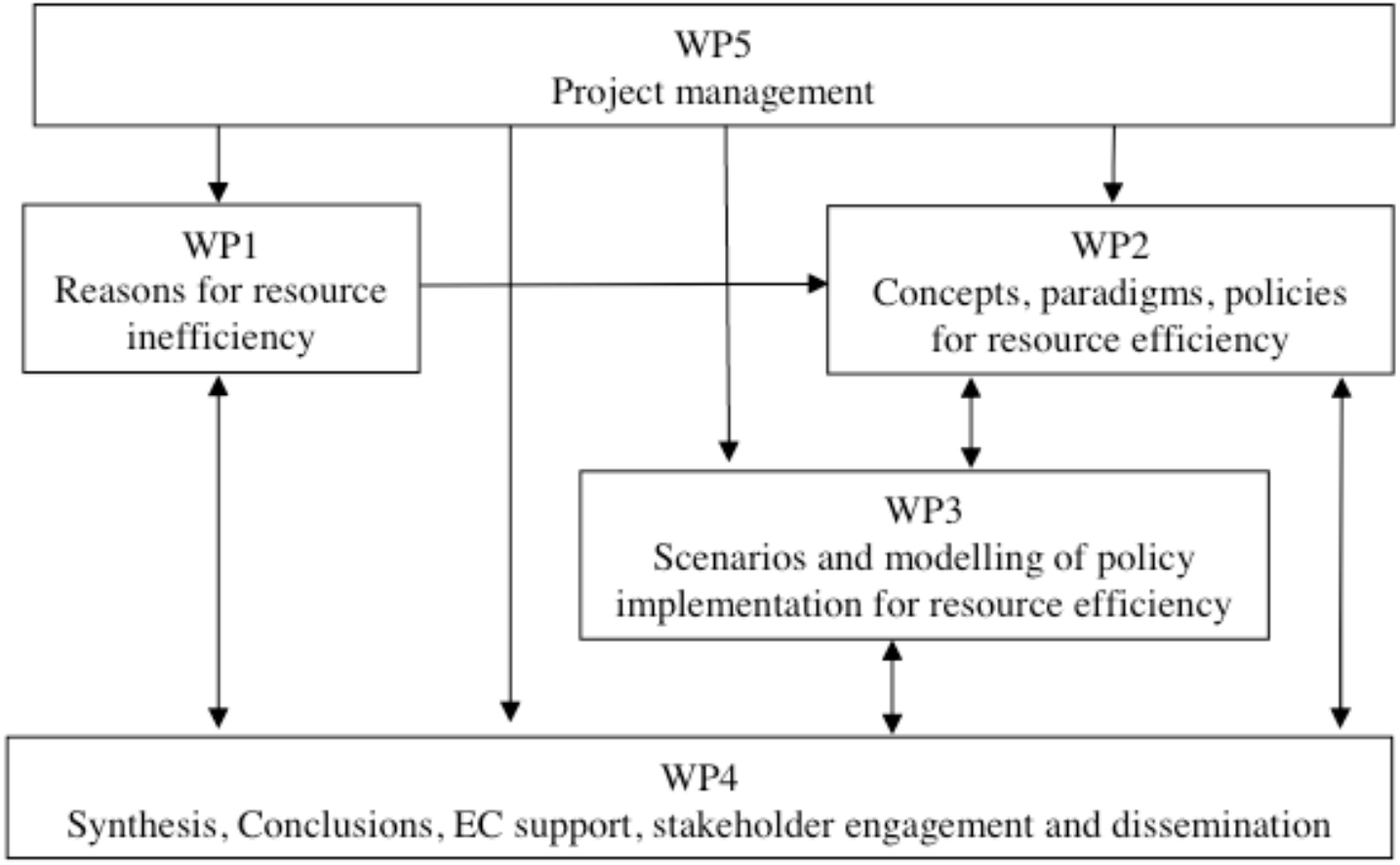
Structure of the project



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WP1: Why resources have been used inefficiently

- Analytical framework
- Lessons from EU policy experiences
- Comparing trends and policies of key countries
- Resource-efficient cost curves for material consumption
- Business barriers to resource efficiency
- Behavioural barriers to resource efficiency

WP2: New concepts and paradigms for policies for RE

- Synthesis of new concepts
- A vision for a resource-efficient Europe
- A new policy mix for resource-efficient economy in Europe
- New business models
- Global governance for resource-efficient economies

A plethora of new concepts

- Industrial ecology, industrial symbiosis
- Waste prevention, priority waste streams, extended producer responsibility
- Eco-innovation
- Transition management, transition towns
- Green growth, green economy, inclusive sustainable growth, Beyond GDP’ , degrowth
- Ecosystem goods and services, natural capital approach, resilience & safe operating space, ecological economics, weak, strong and sensible sustainability
- Multi-level (micro/meso/macro) governance
- Cleaner production, eco-efficiency, resource-efficiency, ‘pollution prevention pays’
- Sustainable Consumption and Production, leapfrogging, slow food,
- Product-service systems, supply chain management, lease society, Natural Step,
- Circular economy, 3R (repair, re-use, recycle), cradle-to-cradle
- Hannover Principles (sustainable design), appropriate technology

WP3: Scenarios and modelling of policy implementation

- Linking economic (EXIOMOD, CGE model; GINFORS, macro-econometric E3 model) and ecological (PIK land use) models
- Scenario formulation
- Running scenarios and generating results
- LCA of selected products and sectors
- Integrated scenario interpretation

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- Twitter: POLFREEEC

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