



### The International Resource Panel: Best Science for Informed Policy Making

High-level Seminar on Responsible Management of Natural Resources for a Sustainable Africa Nairobi, 2-3 November 2013 www.unep.org/resourcepanel

### Key findings on resource use and economic growth



Constant vear 2000 US\$



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# **PEAK OIL**

### New Oil discoveries have been declining since 1964



Note: World oil discovery over 10-year periods, by Association for the Study of Peak Oil and Gas.

# Not Just Peak Oil... "Peak Many Things" In The Next 20 Years

- Food production
- Topsoil
- Phosphorous
- Fish
- Water supplies
- Uranium
- Some minerals copper, zinc and silver



# World's Deserts Growing by 50 Thousand Sq Km per year

# **World Food Prices - FAO**

#### FAO Food Price Index



\* The real price index is the nominal price index deflated by the World Bank Manufactures Unit Value Index (MUV)

### **Sustainable Natural Resource Management: An Opportunity for Prosperity**

International esource

### People are at the Centre of Sustainable Natural Resource Management







y-axis: number of planet earths, x-axis: years

#### Human Welfare and Ecological Footprints compared



# Using natural resources efficiently to derive maximum benefit



There are ways to **decouple environmental impacts** and resource use from **economic growth**...





... while avoiding burden shifting between countries, generations, and trade-offs between impact categories and life cycle stages.



### A Science-Policy Interface for Sustainable Resource Management

- **International Resource Panel:**
- Launched in 2007
- Bridges science and policy
- Aims at Sustainable
  - use of natural resources
  - environmental impacts



## What is the IRP?

International Resource Panel

- Scientists & Experts
- Studies Global Resource Use Issues
- Assesses Latest Research
- Hosted by UNEP



#### Objectives

Independent, authoritative advice for policy makers on the sustainable use of natural resources and environmental impacts over the full life cycle

Explore ways to Decouple Resource Use from Economic Wellbeing

### International Resource Panel Structure



Scientific Panel Internationally recognized experts on sustainable resource management

Scientific assessments and advice, networks

#### **UNEP** Secretariat

Direction, procedures, support in development and implementation of assessments, outreach

#### **Steering Committee**

Governments and Civil Society Organizations

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Strategic guidance, political support, regional synergies



### International Resource Panel Steering Committee









### The Panel - IRP Working Groups



Decoupling	 decoupling environmental impacts and resource use from economic growth.
Cities	between urbanization trends and global material flows
Environmental Impacts	
of Products and Materials	 enviromental impacts of products and materials and definition of priorities in use for impact minimization
Wateriais	
Land and Soils	 global land use and soll management
Global Metal Flows	 global flows and reuse/recycling activities of metals
Water	 water productivity and accounting

### International Resource Panel Published Reports











www. http://www.unep.org/resourcepanel/





Report showed that only "relative decoupling" is happening. But the global resource and climate situation needs absolute decoupling.

Decoupling

**Our first (2011)** 





A new Report on City-Level Decoupling shows cities are the big resource eaters but also have best qualification to reduce that.







## An earlier report on priorities

Shows that most impacts are caused

- Agriculture and food consumption
- Activities using fossil fuels
- Housing and transport.

**Decoupling can mean less consumption**, cleaner production, and indeed rise in resource productivity.







Panel

Also our multi-Reports "Metals Saga" relates to decoupling. When discovering that specialty metals are hardly being recycled, we looked at the challenge of how to increasing recycling rates.









#### New, 2013 Report on Metal Recycling Opportunities, Limits, Infrastructure.







### Distinguish between bulk and specialty metals

For recovering specialty metals, you have to start from the design!



### Another new Metals Report, on Environmental Risks and Challenges ...







.. shows that impacts on land, water, air, and biodiversity stem from all stages of metals mining, processing, and handling. But everywhere you can reduce risks!





# And the sequel to Decoupling 1 is planned to appear in 2014.

### International Resource Panel What comes next?





# A constructive dialogue between scientists and policy makers







# Recycling of Many Metals < 1%!

н	The majority of specialty										He						
3 <b>Li</b> Lithium	4 <b>Be</b> Beryllium		metals have recycling rates lower than 1%!									5 B Boron	° С	7 N	8 O	, F	10
יי Na	12 Mg Magne- sium												14 Si	15 P	16 S	17 Cl	18 <b>A</b> I
19 K	20 Ca	21 <b>Sc</b> Scandium	22 <b>Ti</b> Titanium	23 V Vanadium	24 <b>Cr</b> Chromium	25 Mn Manga- nese	26 Fe Iron	27 Co Cobalt	28 <b>Ni</b> Nickel	29 <b>Cu</b> Copper	30 <b>Zn</b> Zinc	31 <b>Ga</b> Gallium	32 Ge Germani- um	33 <b>As</b> Arsenic	34 <b>Se</b> Selenium	35 <b>Br</b>	36 8
37 Rb	38 <b>Sr</b> Strontium	39 <b>Y</b> Yttrium	40 <b>Zr</b> Zirconium	41 <b>Nb</b> Niobium	42 <b>Mo</b> Molybde- num	43 Tc	44 <b>Ru</b> Ruthenium	45 <b>Rh</b> Rhodium	46 <b>Pd</b> Palladium	47 <b>Ag</b> Silver	48 <b>Cd</b> Cadmium	49 In Indium	50 <b>Sn</b> Tin	51 Sb Antimony	52 <b>Te</b> Tellurium	53 	54 X
55 Cs	56 Ba Barium	57-71	72 Hf Hafnium	73 <b>Ta</b> Tantalum	74 W Tungsten	75 <b>Re</b> Rhenium	76 <b>Os</b> Osmium	77 <b>Ir</b> Iridium	78 <b>Pt</b> Platinum	79 Au Gold	80 Hg Mercury	81 <b>Tl</b> Thallium	82 Pb Lead	83 <b>Bi</b> Bismut	84 Po	85 At	86 <b>F</b>
87 Fr	® Ra	89-103	104 Rf	105 Db	106 Sg	107 Sg	<sup>108</sup> Hs	109 Mt	110 Ds	nn Rg	112 Uub	113 Uut	114 Uug	115 Uup	116 Uuh	117 Uus	11 L
0 % 5 %		57 La Lantha- num	58 Ce Cerium	59 <b>Pr</b> Praseo- dymium	60 <b>Nd</b> Neodymi- um	₀1 Pm	62 <b>Sm</b> Samarium	63 Eu Europium	64 <b>Gd</b> Gadolini- um	65 <b>Tb</b> Terbium	66 <b>Dy</b> Dysprosi- um	67 <b>Ho</b> Holmium	68 <b>Er</b> Erbium	69 <b>Tm</b> Thulium	70 <b>Yb</b> Ytterbium	71 <b>Lu</b> Lutetium	
		89 Ac	90 Th	91 Pa	92 U	93 Np	94 <b>Pu</b>	95 <b>Am</b>	96 Cm	97 <b>Bk</b>	98 Cf	99 <b>Es</b>	100 <b>Fm</b>	101 Md	102 No	103 Lr	



## **Renewable Energy**





## **Decentralized Systems**











### Objective: Decouple Impact from Growth



**2005** ce: Klaus Kögler, European Commission, Directorate General for the **200** for th
### Relative decoupling: GDP grows faster than resource use. But resource use still grows.

Ores and industrial minerals









Source: Krausmann et al., 2009; based on SEC Database 'Srowth in global materials use, GDP and population during the 20th century', Version 1.0 (June 2009); http://uni-klu.ac.at/soce.c/inhalt/3133.htm)

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#### The Global South typically wants relative decoupling, and the North should aim at absolute decoupling.



#### The classical origin of the decoupling idea: The Kuznets-curve of local pollution.



#### GDP goes with Domestic Material Consumption (DMC)







#### Creating the Kuznets Curve for resource use means intentional increase of resource productivity



#### ... and assist developing countries to tunnel through



#### Similarly, GDP goes with CO<sub>2</sub> intensity.



Source: Energy Information Administration, USA, 2006

#### So we have to create a Kuznets Curve of decarbonization.



#### And then help poorer countries tunneling through.



### Pathways to Decoupling

- Efficiency
- Productivity
- Conservation
- Miniaturize
- Dematerialize
- Share Underused Assets

## **Level of Change** Cost **Deep Change** Incremental Change **Structural** Transformation **BAU**



### Why absolute decoupling? Because of the footprints dilemma



# If 7 b people had US size footprints, we would need 5 planets Earth



# If we manage to have fivefold increase of resource productivity, one planet would do!





This gives an indication, that we need (at least) a five fold decoupling of wellbeing from resource consumption!



The second report on Decoupling will distinguish between

1. Decoupling by maturation (overcoming initial clumsiness, saturating infrastructures)

2. Decoupling by trade (problem shifting)

3. Decoupling by intentional increase of resource productivity



## (To be published and exp





Resource

**Intentional increase of resource productivity can lead very far!** 

To visualize this, let us ask a question from physics.





**Imagine** a **bucket of water** of 10 kg weight How many kilowattlift it from sea level **Development Alternatives** 



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

(knowing that one wattsecond is one Joule or one Newton-meter; <sup>1</sup>/<sub>4</sub> kwh is 900.000 watt-seconds)



Development Alternatives



#### meaning that a five-fold increase in resource productivity will just be the early beginning of a huge story.



#### **A few Factor Five examples ...**



#### **Superefficient cars**



#### **"Passive houses": a factor of ten more heat efficient**



#### **From 12 lane highways to bicycle centered cities**



Atlanta



#### Copenhagen

#### Atlanta is 25 times larger than Barcelona, but has a smaller population



#### **LED replacing incandescent bulbs: a factor of 10**



#### **From Portland cement to geopolymer cement** (e.g. fly ashes from coal power plants).



#### **Energy efficiency**

### Steel Production & Maintenance



**Development Alternatives** 

- **EAF** Production Method
- Net Shape Casting
- Heat & Power Recovery
- Feedstock Change
- Fuel Switching
- Energy Monitoring & Management Systems
- Preventative Maintenance

Standard

> Factor 5



#### From using water once to purifying (recycling) it



#### **Development Alternatives**

#### From flood irrigation to advanced drip irrigation



#### Another bold approach: Building the Blue Economy

10 years, 100 innovations, 100 million jobs



HOW TO DO IT I MONEY





by Gunter Pauli. The motto is mostly cascades of resource use; and job creation! Most of his examples are from developing countries Development Alternatives

### **Systemic Issues**

#### Basic Needs AND Environment



### **Systemic Problems**

#### **Production Systems** AND Consumption Patterns



### **Systemic Solutions**

#### Sustainable Jobs AND Sustained Resources



### **Global Ramifications**

Northern Concerns AND Southern Imperatives



# Urgent Need for

Charter or even Convention on Global Management of Natural Resources

= SCP