



ECONOMIC MODEL TRANSFORMATION AND THE ROLE OF THE BIOECONOMY

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STRUCTURE

- *THE WORLD WE LIVE IN AND CHALLENGES WE ARE FACING*
- *ECONOMIC MODEL DRIVING OUR LIVES*
- *BIOECONOMY, CIRCULAR ECONOMY AND SUSTAINABILITY*
- *TO CONCLUDE ...*



***THE WORLD WE
LIVE IN
AND CHALLENGES WE ARE
FACING***



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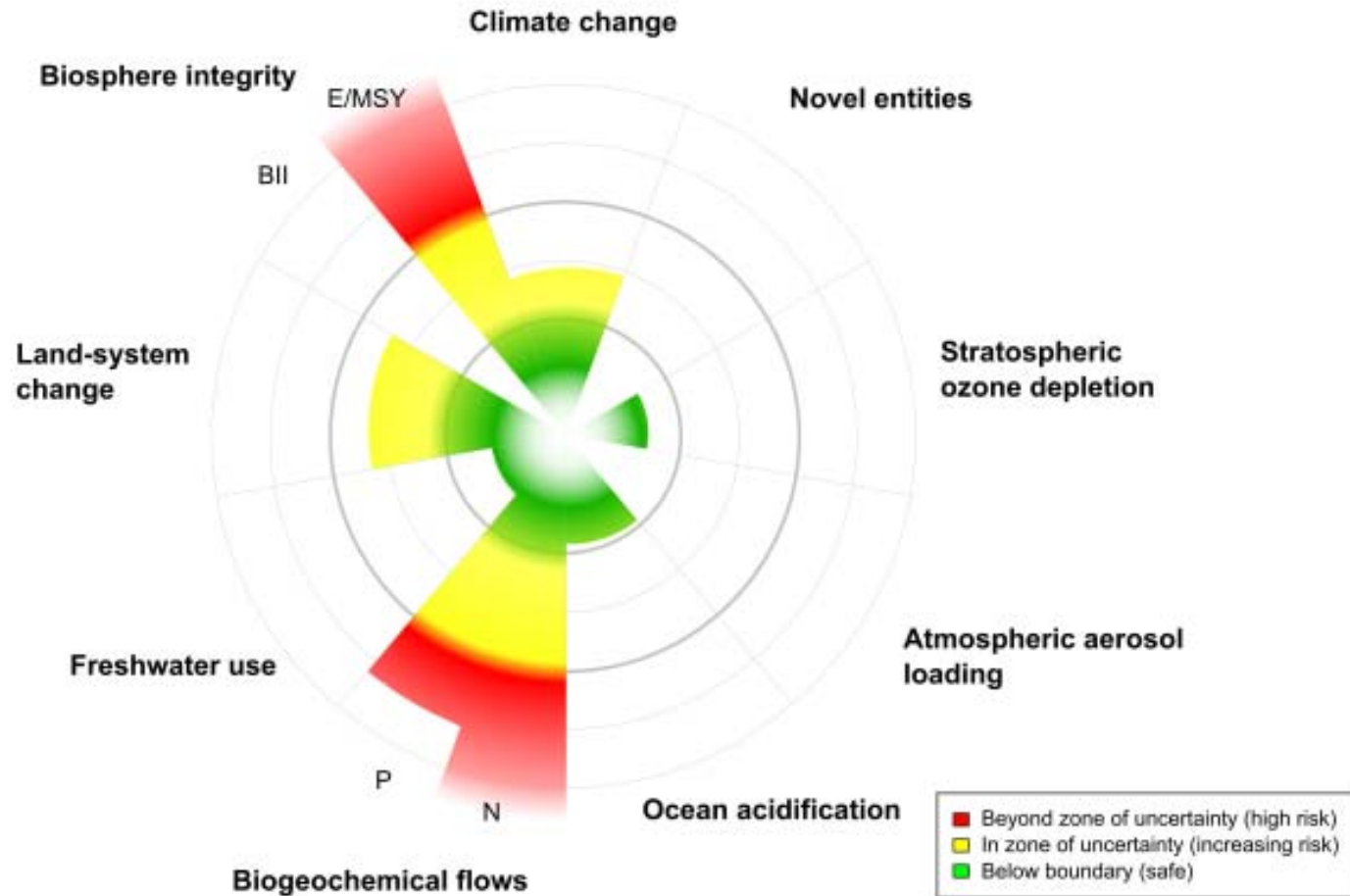
20th CENTURY

THE GREAT ACCELERATION



- *Growth of population by a factor 3.7*
- *Annual extraction of construction materials grew by a factor of 34, ores and minerals by a factor of 27, fossil fuels by a factor of 12, biomass by a factor of 3.6*
- *Total material extraction grew by a factor of 8*
- *GHG emissions grew by a factor of 13*

“PLANETARY BOUNDARIES”



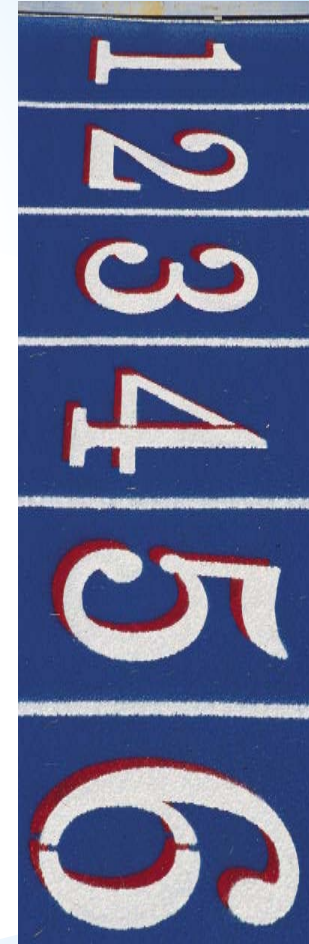
Source: Steffen et al. 2015

21th CENTURY

FACTS WE CAN NOT IGNORE

POPULATION

- *Population* growth (2050 - 9.7 billion)
- *Per capita consumption* growth (McKinsey estimates up to 3 billion consumers moving from low to middle class consumption till 2030)



21th CENTURY

FACTS WE CAN NOT IGNORE

POVERTY AND SOCIAL INEQUALITY

- *Oxfam Report: 62 people own the same as half of the world and the richest 1% is more **wealthy** than the rest of the world)*
- *Nearly 800 million people are **hungry**, over 2 billion suffer from micronutrient deficiencies ... while over 2 billion people are **obese***
- *We **throw away** one third of the **food** we produce*



21th CENTURY

FACTS WE CAN NOT IGNORE

ENVIRONMENT

- Increasing evidence of the *climate change* threat
- 60% of *ecosystems* already degraded or used unsustainably
- 33% of *soils* is moderately to highly degraded due to erosion, nutrient depletion, acidification, salinization, compaction and chemical pollution
- 467 000 premature *deaths* yearly in EU *due to air pollution* (7 millions globally)





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21th CENTURY

FACTS WE CAN NOT IGNORE

URBANISATION

- *Around 50% of urban fabric expected to exist by 2050 still needs to be constructed*
- *Between 2000 and 2030 it is estimated that developing countries would have added 400,000 km² of built-up urban area, equal to the world's built-up area in 2000*
- *In the three years period (2011-2013), China has used more cement than the USA during the entire 20th century*



21th CENTURY

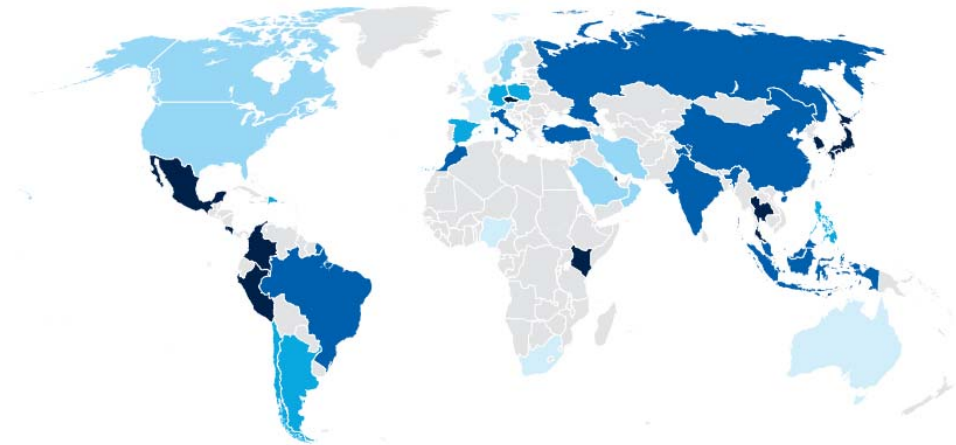
FACTS WE CAN NOT IGNORE

COMPUTERS AND ROBOTICS

- Nearly *half* of all the work we do, will be able to be *automated* by the year 2055 (McKinsey Global Institute)

Employee weighted overall % of activities that can be automated by adapting currently demonstrated technologies¹

<45 45–47 47–49 49–51 >51 No data



21th CENTURY

FACTS WE CAN NOT IGNORE

GLOBALISATION

- For the first time in a human history we face the emergence of a single, tightly coupled *human social-ecological system of planetary scope*. We are more *interconnected* and *interdependent* than ever.
- Increased *multi-polarity*, but not in a way developed world expected to happen
- Our individual and collective *responsibility* has enormously increased.



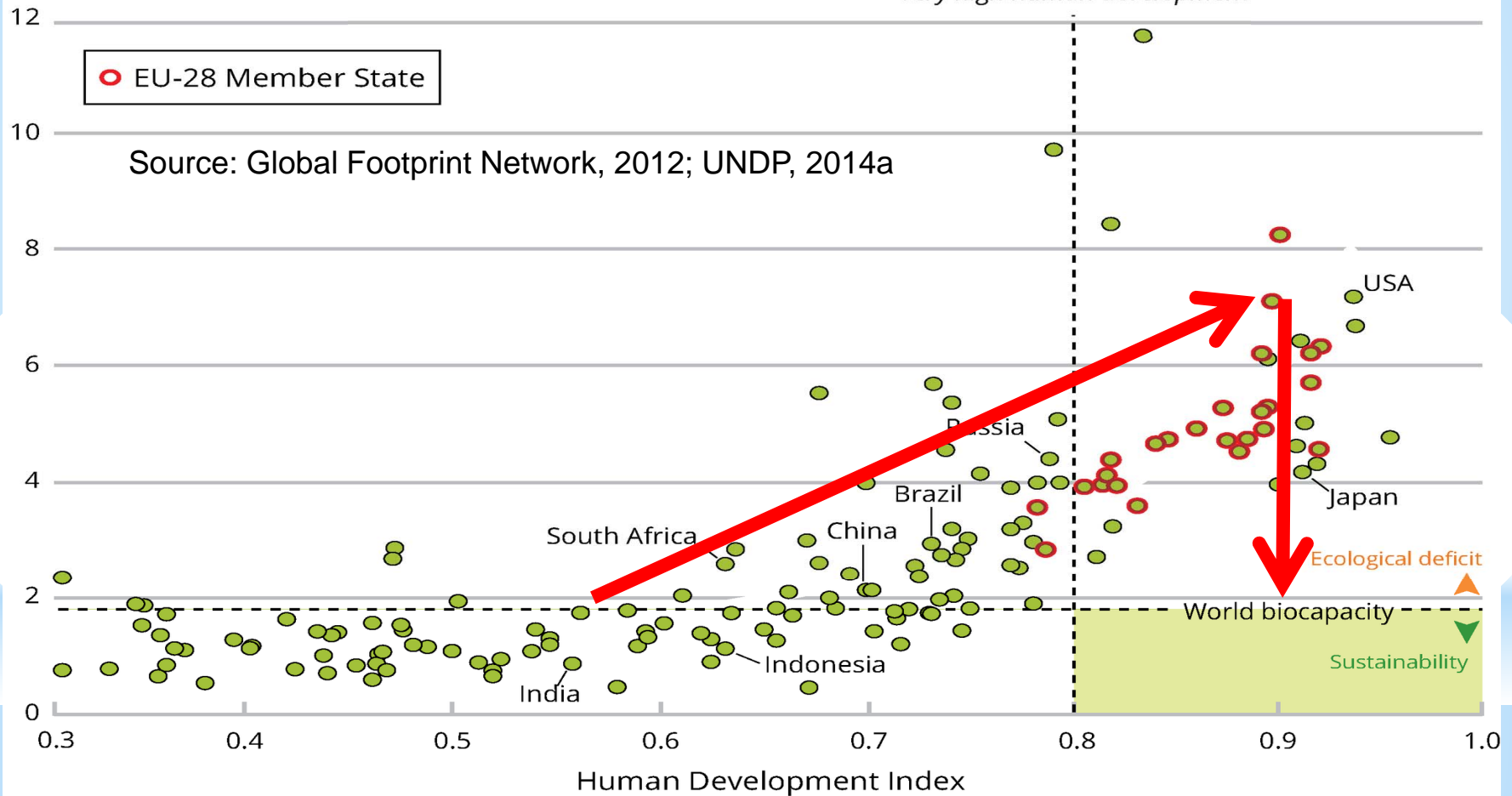
ECONOMIC MODEL

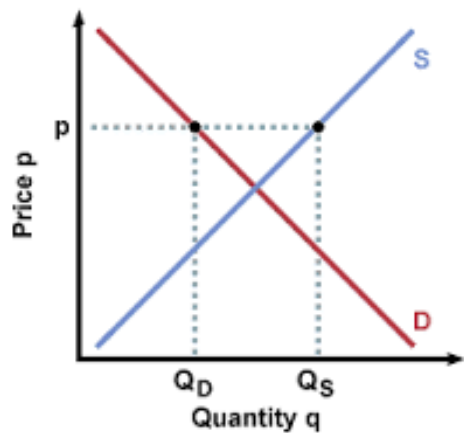
DRIVING OUR LIVES

DEVELOPMENT TRAJECTORY ...

Ecological footprint
(hectares per person per year)

'Very high human development'





Price Signals:

*Financial Capital Overvalued
Human Capital Undervalued
Natural Capital not Valued*



Market

*Producers/Consumers
Rational Behaviour*



Economic model

Inbuilt Economic, Social, Environmental Imbalances

SUSTAINABLE DEVELOPMENT: DEFINITIONS, PRINCIPLES, POLICIES

Herman E. Daly: Invited Address, WB, 30/04/2002

- The *optimal scale of the macro-economy relative to its containing ecosystem* is the critical issue to which the macroeconomics has been blind. This blindness to the costs of growth in scale is largely a consequence of ignoring throughput, and has led to the problem of ecological un-sustainability.
- *Throughput* - entropic physical flow from nature's sources through the economy and back to nature's sinks - *should be non-declining*. *Natural capital* should be kept intact.
- Bringing the concept of throughput into the foundations of economic theory does not reduce economics to physics, but it does force the *recognition of the constraints of physical law on economics*.



A Venn diagram consisting of three overlapping circles. The top circle is labeled 'ECONOMIC', the bottom-left circle is labeled 'SOCIAL', and the bottom-right circle is labeled 'ENVIRONMENT'. The circles overlap in the center, and the background features a light blue gradient with white curved shapes.

ECONOMIC

SOCIAL

ENVIRONMENT

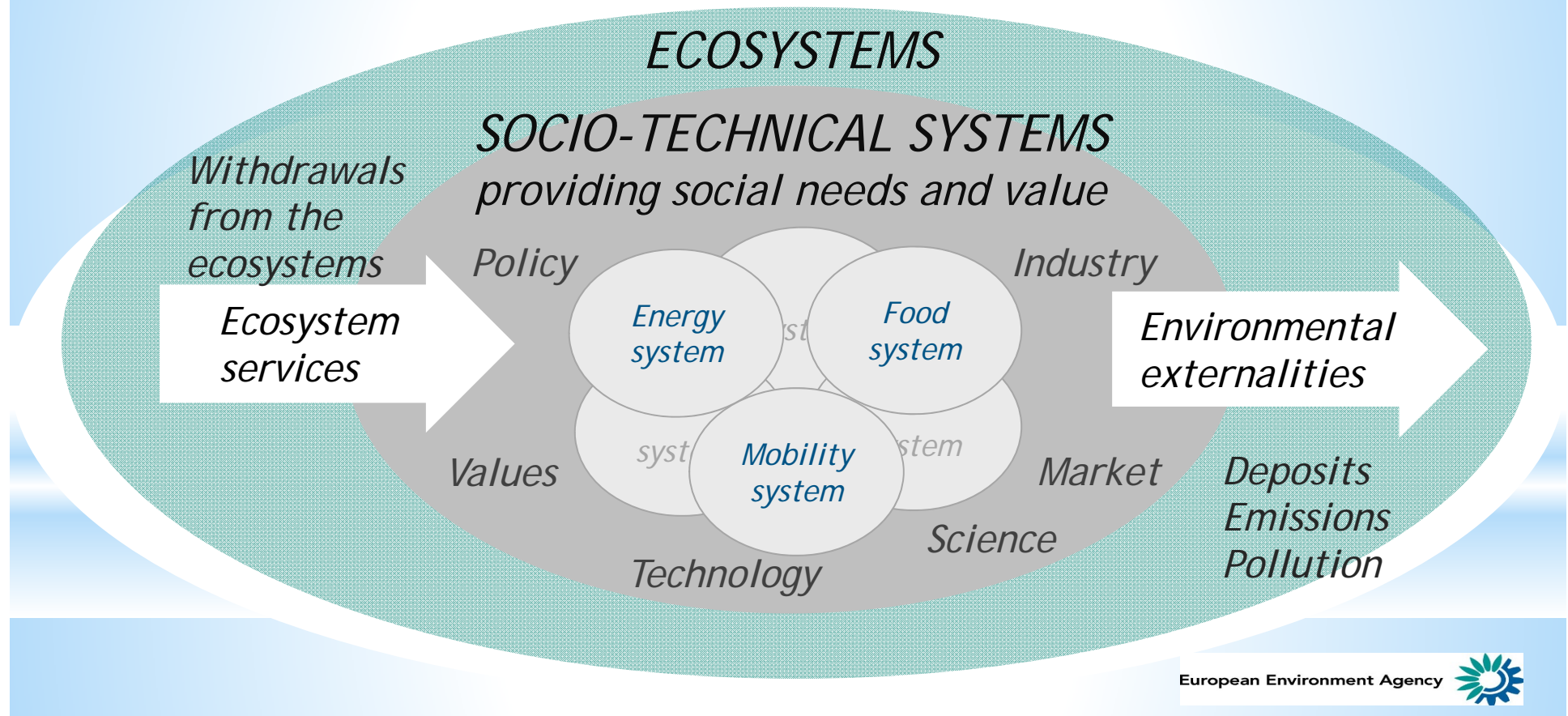


ECOSYSTEMS

SOCIO-TECHNICAL SYSTEMS
providing social needs and value

LIVING WELL WITHIN ECOLOGICAL LIMITS

ECONOMIC SYSTEM FUNCTION OF ECOSYSTEM



*SUSTAINABLE DEVELOPMENT: DEFINITIONS,
PRINCIPLES, POLICIES*

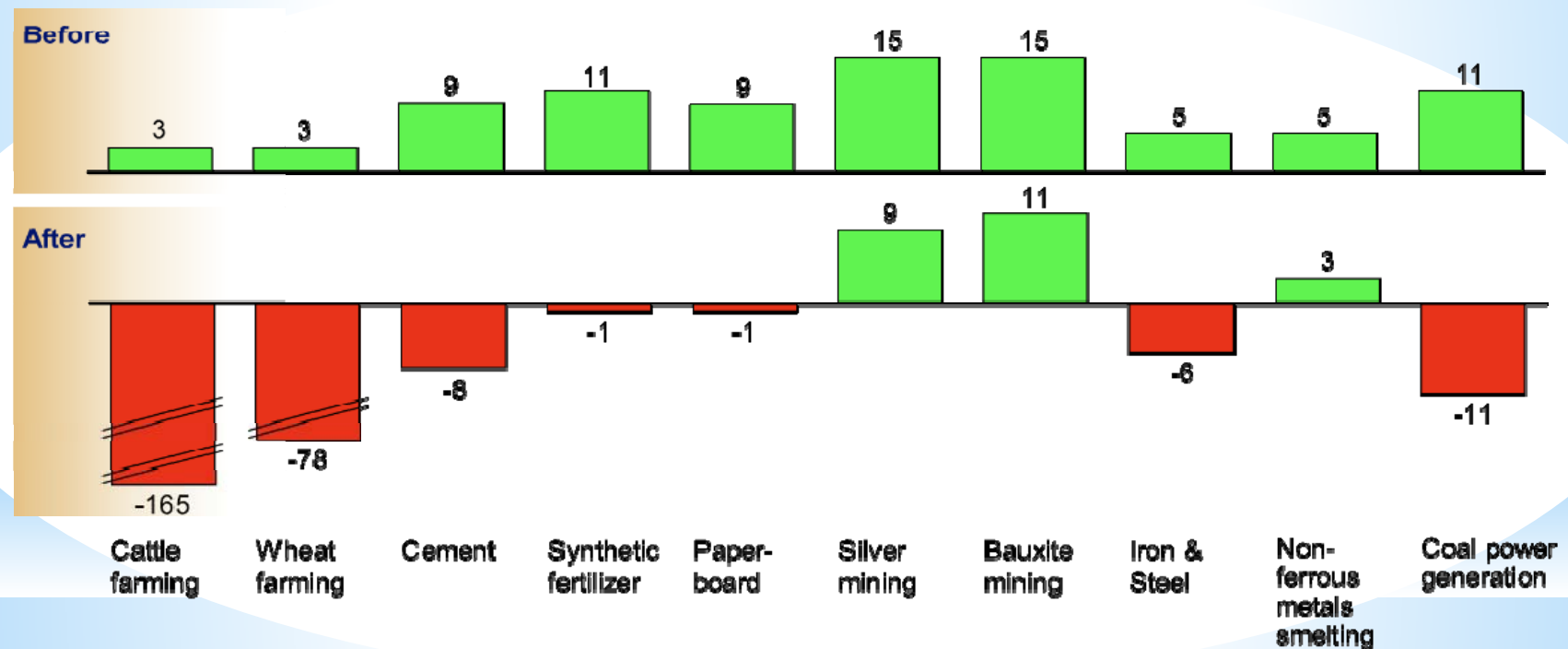
Herman E. Daly: Invited Address, WB, 30/04/2002

*How do we know that throughput growth, or
even the GDP growth, is not at the margin
increasing illth faster than wealth, making us
poorer than richer?*

EXTERNALITIES - COSTS THAT EXIST, BUT WE DENY THEM

Negative profit margins in most of the world's raw material industries if natural capital costs are Included

Profit margin (EBIT) before and after natural capital costs, based on top-2 companies in each Morgan Stanley Composite Index category, Percent, 2012



Source: Adapted from: Trucost and TEEB (2013)

- *“Good” growth - “Bad” growth -*
How much of the “growth” in the
past actually qualifies for growth?
- *GDP growth rates - GDP levels*
- *Remember: 10% growth - doubling*
of everything in 7 years!





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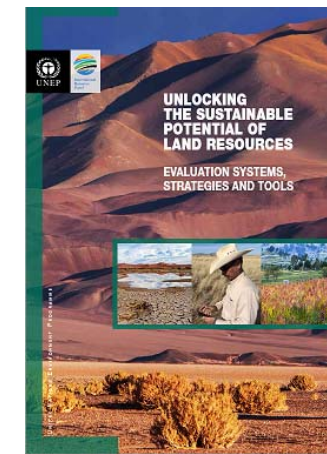
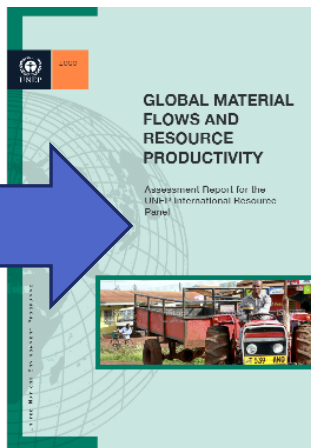
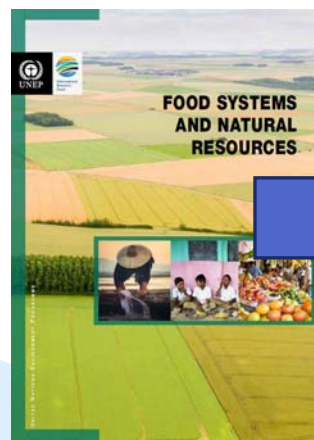
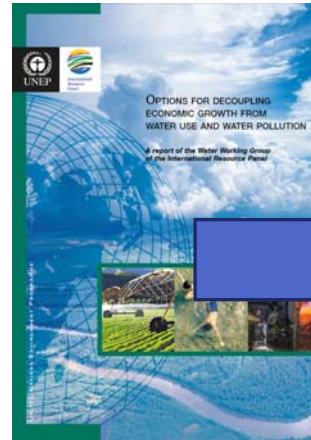
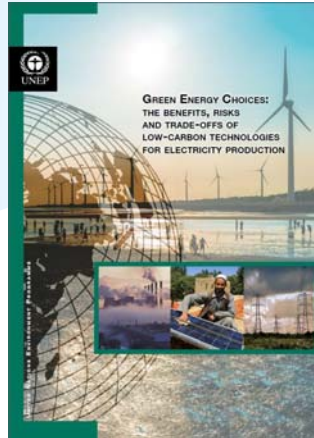


*In the mid-term, except in specific cases,
resource shortage will not be the core
limiting factor of our (economic)
development ...*

*... but the environmental consequences
caused by this excessive and irresponsible use
of resources will be!*



IN THE RECENT MONTHS ...



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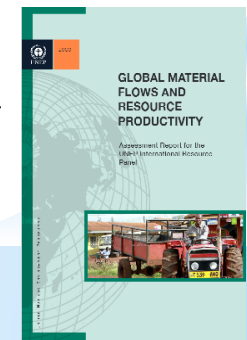


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GLOBAL MATERIAL FLOWS AND RESOURCE PRODUCTIVITY (1970-2010)



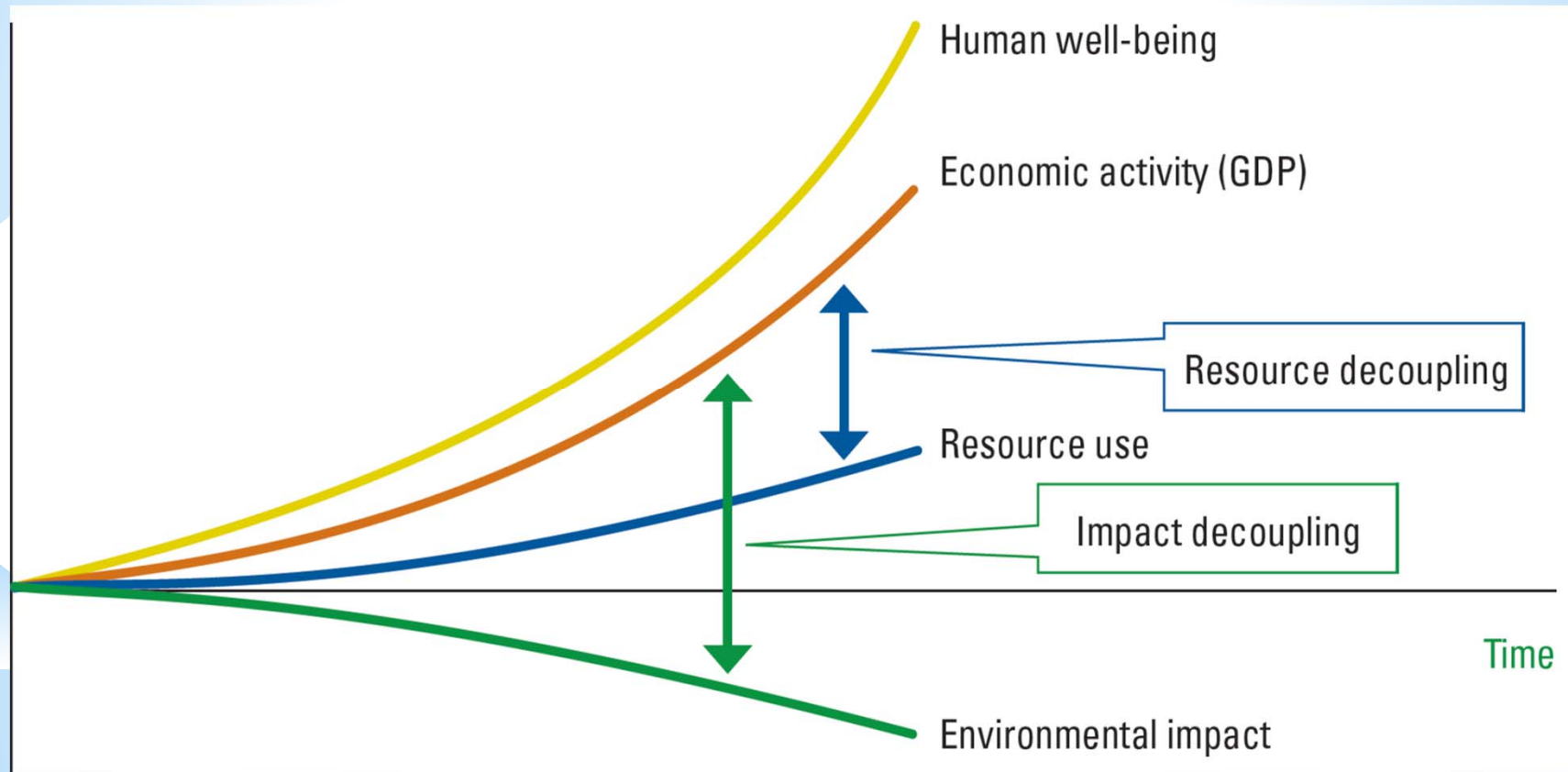
- *Consumption* has been stronger driver of growth in material use than population growth
- *Since 2000 material efficiency has declined* - global economy needs more materials per unit of GDP. Production has shifted from material efficient countries to countries that have lower material efficiency
- The *richest countries* consume on average *10 times more* materials as the poorest
- The level of well-being achieved in wealthy industrial countries *cannot be generalised globally based on the same system of production and consumption*





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DECOUPLING IS THE IMPERATIVE OF MODERN ENVIRONMENTAL AND ECONOMIC POLICY



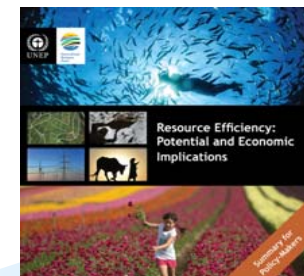


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CONCLUSIONS FROM THE RE REPORT: REALISING THE POTENTIAL

- With concerted action, there is *significant potential for increasing resource efficiency*.
- *Markets will not achieve* higher rates of resource efficiency *by themselves*. *Public policy and political will* be needed.
- There are *significant barriers* to the increases in resource efficiency required, *but they can be removed*.
- Improving resource efficiency is *indispensable for meeting climate change targets* cost effectively.



CLIMATE

CARBON MANAGEMENT

LAND

WATER

GHG

MATERIALS

DECOUPLING

RESOURCES

LOW CARBON RESOURCE EFFICIENT ECONOMY



BIOECONOMY

*CIRCULAR ECONOMY
AND SUSTAINABILITY*

THE GLOBAL GOALS

For Sustainable Development





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SDGs DIRECTLY DEPENDENT ON NATURAL RESOURCES





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Sustainable Consumption and Production is the most efficient strategy to avoid trade-offs and create synergies to resolve the development and environmental challenges articulated in the SDGs.

PRINCIPLE

1

Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows

PRINCIPLE

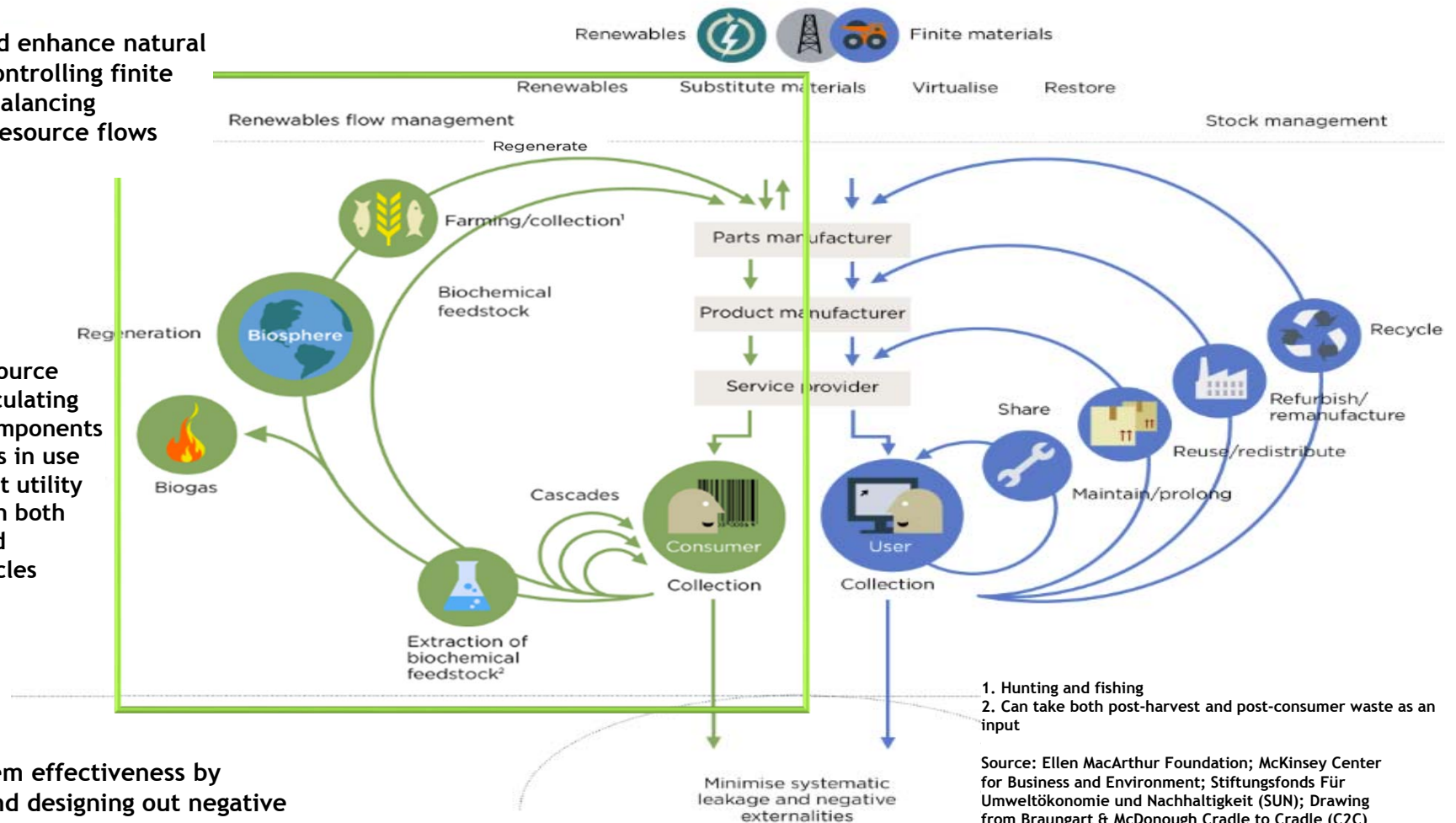
2

Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles

PRINCIPLE

3

Foster system effectiveness by revealing and designing out negative externalities



BIOECONOMY

*Has a major development potential
and could be at the heart of the transition to the new
economic model.*

*But it has to be ecologically and socially sustainable,
organised in a responsible and fair way, and consistent
with the logic of decoupling and circular economy*

*It is about not overusing the biosphere, but also not
underusing its potential.*

- *KNOWLEDGE (Creation)*
- *INNOVATION (Incentives)*
- *PRODUCTS (Design)*
- *CONSUMERS (Behaviour)*
- *BUSINESS MODELS (Sharing Products to services)*



Any global transition is a major new opportunity for the innovation, new development opportunities, new jobs

*And alternative ...
I would rather not think and talk about it!*



TO CONCLUDE ...

*SUSTAINABLE, LOW-CARBON, CIRCULAR, GREEN,
RESOURCE EFFICIENT, ENERGY EFFICIENT,
DECOUPLING, 3Rs, ECOLOGICAL CIVILISATION,
C2C, BIOECONOMY, ECO-ECONOMY, BLUE ...*

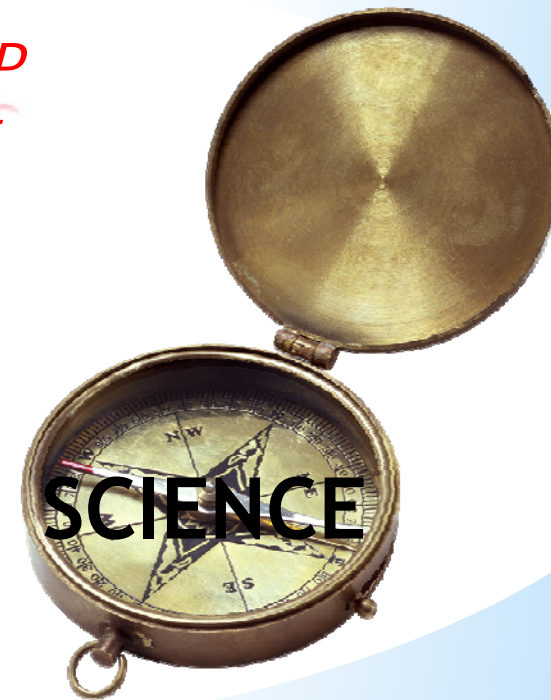
- *What we actually talk about*



*WE HAVE TO FIX A BROKEN
COMPASS
(PAVAN SUKHDEV)*

*NEW ECONOMIC MODEL BASED ON SCP
INTEGRATING ALL THREE PILLARS OF
SUSTAINABILITY IS*

*NECESSARY
AND UNAVOIDABLE*



MARKETS

CANNOT ENSURE EFFICIENCY IN THE ALLOCATION AND USE OF RESOURCES ...



- *If prices do not reflect the true value and costs of resources,*
- *If rewards to capital are disproportionate to other inputs (financial capital is overvalued, human capital is undervalued and natural capital in many cases not valued at all),*
- *If managers on annual contracts are induced to make short term investment decisions overly influenced by bonuses based on short term share price, if ...*

Better regulation

is not about less regulation, it is about taking responsibility for public good and creating the conditions for confidence to invest in technologies for the markets of the future

MAIN POINTS TO REMEMBER

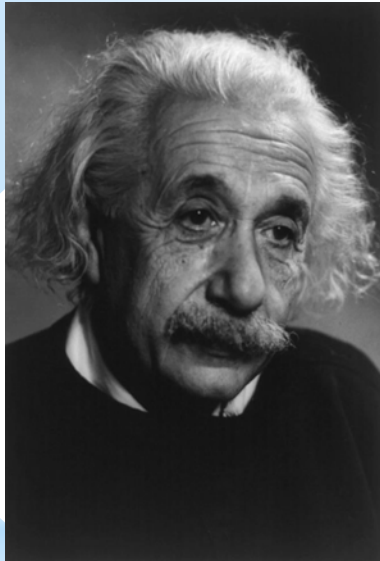
- *For the first time in a human history we face the emergence of a single, tightly coupled **human social-ecological system of planetary scope**.*
- *It is about **system change**. Without **leadership** and improved **global governance** SDGs are only a wishful thinking.*
- *Transition to a **new economic model** integrating all pillars of sustainability should be in the centre of our attention. Trade-offs among various SDGs are unavoidable. **SCP** is the most efficient strategy to avoid them and create synergies. **Circular economy** is the best concept to operationalise it in practice.*
- ***Bioeconomy** has a great potential, but has to be ecologically and socially sustainable, organised in a responsible and fair way, and consistent with the logic of decoupling and circular economy.*

MAIN POINTS TO REMEMBER

- *Implementing SDGs should be priority of the government* defined in the strategic documents, supported by indicators, monitoring, reporting, linked to the core economic policy decisions.
- *All levels* (global, European, national, local) and *all stakeholders* (public & private actors, financial sector, civil society, academia...) should actively participate in the system change. *Active dialogue with potential losers* is necessary to make transition possible.
- *If we are to avoid globally extensive and inter-systemic crisis and frequent conflicts* than let's get serious about implementing what we have agreed in SDGs. Changes are *unavoidable* and humans are supposed to be intelligent. It is high time to prove it. *Europe* should stay in the lead.

WILL IT BE EASY?

ALBERT EINSTEIN



When asked why it is that mankind has stretched so far as to discover the structure of the atom, but we have not been able to devise the political means to keep the atom from destroying us he replied:

“That is simple, my friend. It is because politics is more difficult than physics”

*The future has already arrived
and it is called*

present



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THANK YOU

www.unep.org/resourcepanel