



TRANSFORMATION OF OUR ECONOMIES

ROLE OF SCIENCE AND POLICY IMPLICATIONS

Janez Potočnik

Co-Chair International Resource Panel – UNEP

Helsinki - SYKE, March 2nd, 2015

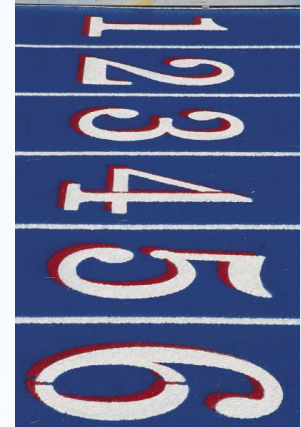
* **SUSTAINABLE, CIRCULAR, GREEN, RESOURCE EFFICIENT ...**

- **WHAT WE ACTUALLY TALK ABOUT**
- **SUSTAINABILITY – ECONOMIC, SOCIAL,
ENVIRONMENTAL ...**
- **ECONOMY IS IN DENIAL OF PHYSICAL LAWS**



* **FACTS WE TRY TO IGNORE ...**

- **POPULATION GROWTH**
- **PER CAPITA CONSUMPTION GROWTH**
- **THE DOUBLING STORY ...**
- **LIMITED RESOURCES - FRESH WATER, OCEANS, LAND AND SOIL, CLEAN AIR, RAW MATERIALS, BIODIVERSITY, ECOSYSTEMS, FUEL ...**
- **TODAY 60% OF ECOSYSTEMS DEGRADED OR USED UNSUSTAINABLY**



* **ECONOMIC ARGUMENTS FOR CHANGE**

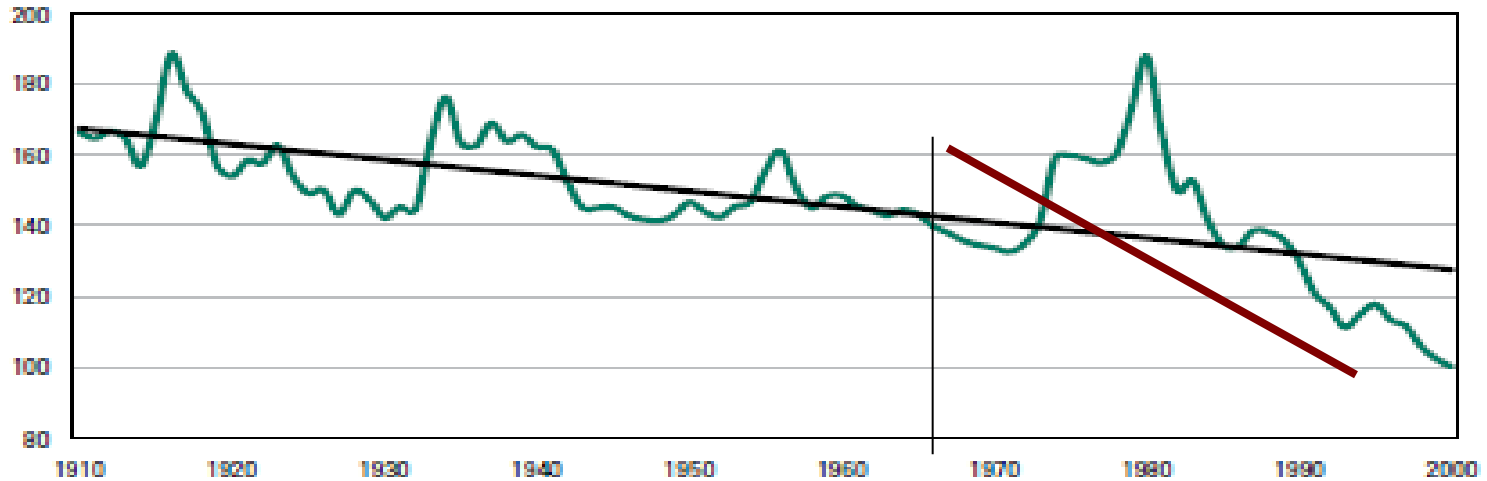
- **RESOURCE INTENSIVE MODEL OF PRODUCTION AND LOCK-INS**
- **CHANGE OF RESOURCE PRICE TRENDS AND INCREASED PRICE VOLATILITY**

* A HUNDRED YEARS OF DECLINE OF RESOURCE

PRICES

Figure 2.4. Composite resource price index (at constant prices, 1900–2000)

Indexed
2000=100



Source: Wagner et al., 2002

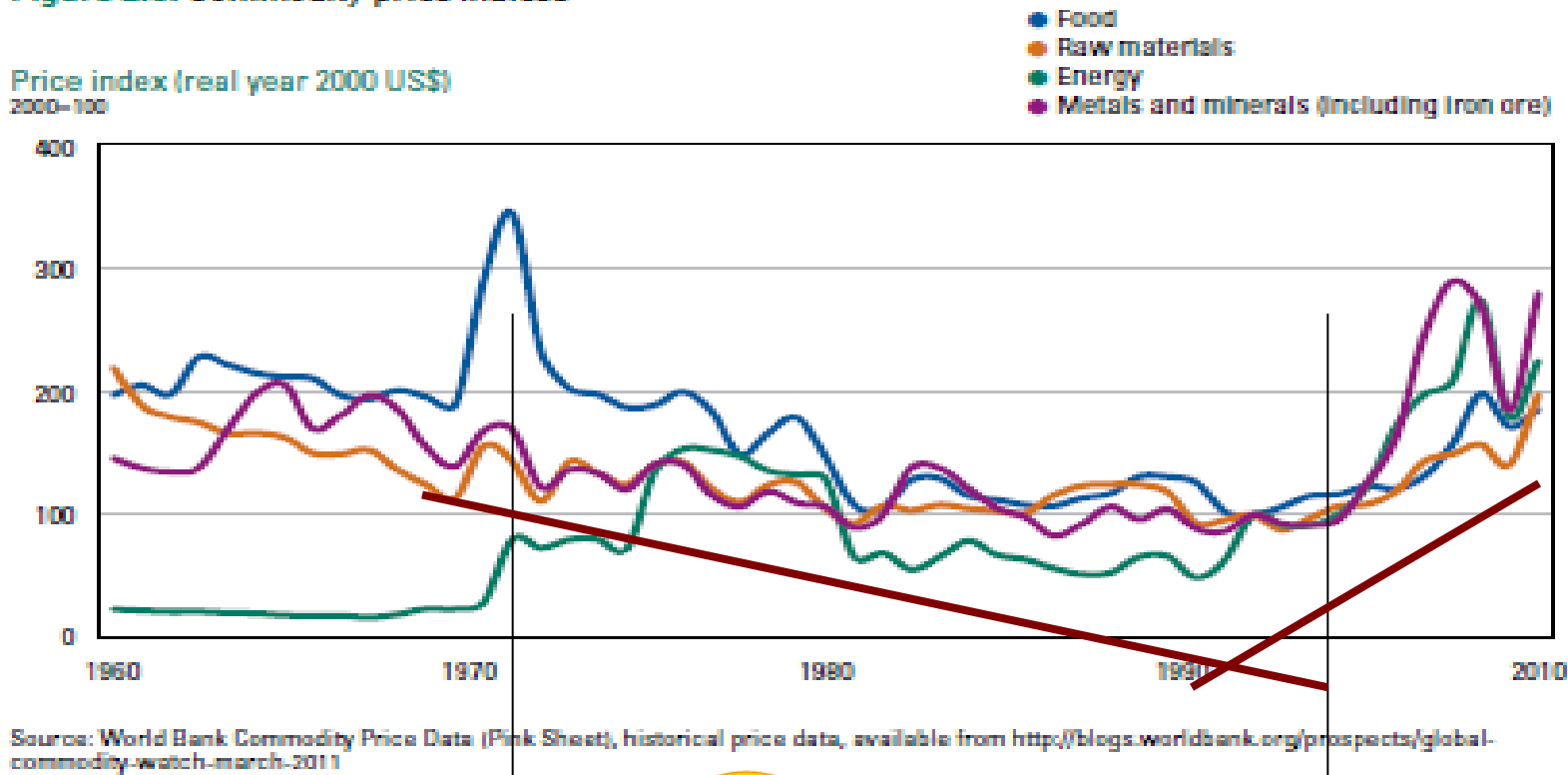


International
Resource
Panel



RESOURCE PRICES ON THE RISE DESPITE RECENT TRENDS

Figure 2.5. Commodity price indices



International
Resource
Panel

* **ECONOMIC ARGUMENTS FOR CHANGE**

- **RESOURCE INTENSIVE MODEL OF PRODUCTION AND LOCK-INS**
- **CHANGE OF RESOURCE PRICE TRENDS AND INCREASED PRICE VOLATILITY**
- **COST STRUCTURE OF MANUFACTURING SECTOR**
- **IMPORT DEPENDENCY**

 **WE CAN DO
MUCH BETTER!**



* INEFFICIENCIES AROUND US

- TURNING COAL INTO LIGHT IS STILL ONLY 3% EFFICIENT
- ONLY 15% OF THE ENERGY WE PUT IN OUR PETROL TANK IS USED TO MOVE OUR CAR DOWN THE ROAD
- 80% OF WHAT WE PRODUCE IS USED ONCE AND DISCARDED
- ONLY 1% OF THE VALUABLE RARE EARTHS THAT WE USE IN PRODUCTS ARE RECYCLED AT THE END OF PRODUCTS LIFE
- **80% OF RESOURCES ARE USED BY 20% OF EARTH POPULATION**

* **MOBILE PHONE ... OUR POCKET PARTNER**

- **WEDDING RING: 10 TONNES OF GOLD ORE
10 KILOS OF MOBILE PHONES**
- **LESS THAN 10% RECYCLED**
- **IN EU MORE THAN 100 MIO EACH YEAR IN THE DRAWERS**

**2.4 TONNES OF GOLD
25 TONNES OF SILVER
1 TONNE OF PALLADIUM
900 TONNES OF COPPER**



END OF LIFE RECYCLING RATE (GLOBAL) FOR 62 METALS

UNEP EVALUATION JANUARY, 2010

1 <u>H</u>																	2 <u>He</u>
3 <u>Li</u>	4 <u>Be</u>											5 <u>B</u>	6 <u>C</u>	7 <u>N</u>	8 <u>O</u>	9 <u>F</u>	10 <u>Ne</u>
11 <u>Na</u>	12 <u>Mg</u>											13 <u>Al</u>	14 <u>Si</u>	15 <u>P</u>	16 <u>S</u>	17 <u>Cl</u>	18 <u>Ar</u>
19 <u>K</u>	20 <u>Ca</u>	21 <u>Sc</u>	22 <u>Ti</u>	23 <u>V</u>	24 <u>Cr</u>	25 <u>Mn</u>	26 <u>Fe</u>	27 <u>Co</u>	28 <u>Ni</u>	29 <u>Cu</u>	30 <u>Zn</u>	31 <u>Ga</u>	32 <u>Ge</u>	33 <u>As</u>	34 <u>Se</u>	35 <u>Br</u>	36 <u>Kr</u>
37 <u>Rb</u>	38 <u>Sr</u>	39 <u>Y</u>	40 <u>Zr</u>	41 <u>Nb</u>	42 <u>Mo</u>	43 <u>Tc</u>	44 <u>Ru</u>	45 <u>Rh</u>	46 <u>Pd</u>	47 <u>Ag</u>	48 <u>Cd</u>	49 <u>In</u>	50 <u>Sn</u>	51 <u>Sb</u>	52 <u>Te</u>	53 <u>I</u>	54 <u>Xe</u>
55 <u>Cs</u>	56 <u>Ba</u>	*	72 <u>Hf</u>	73 <u>Ta</u>	74 <u>W</u>	75 <u>Re</u>	76 <u>Os</u>	77 <u>Ir</u>	78 <u>Pt</u>	79 <u>Au</u>	80 <u>Hg</u>	81 <u>Tl</u>	82 <u>Pb</u>	83 <u>Bi</u>	84 <u>Po</u>	85 <u>At</u>	86 <u>Rn</u>
87 <u>Fr</u>	88 <u>Ra</u>	**	104 <u>Rf</u>	105 <u>Db</u>	106 <u>Sg</u>	107 <u>Bh</u>	108 <u>Hs</u>	109 <u>Mt</u>	110 <u>Ds</u>	111 <u>Rg</u>	112 <u>Uub</u>	113 <u>Uut</u>	114 <u>Uuq</u>	115 <u>Uup</u>	116 <u>Uuh</u>	(117) <u>(Uus)</u>	118 <u>Uuo</u>

* <u>Lanthanides</u>	57 <u>La</u>	58 <u>Ce</u>	59 <u>Pr</u>	60 <u>Nd</u>	61 <u>Pm</u>	62 <u>Sm</u>	63 <u>Eu</u>	64 <u>Gd</u>	65 <u>Tb</u>	66 <u>Dy</u>	67 <u>Ho</u>	68 <u>Er</u>	69 <u>Tm</u>	70 <u>Yb</u>	71 <u>Lu</u>
** <u>Actinides</u>	89 <u>Ac</u>	90 <u>Th</u>	91 <u>Pa</u>	92 <u>U</u>	93 <u>Np</u>	94 <u>Pu</u>	95 <u>Am</u>	96 <u>Cm</u>	97 <u>Bk</u>	98 <u>Cf</u>	99 <u>Es</u>	100 <u>Fm</u>	101 <u>Md</u>	102 <u>No</u>	103 <u>Lr</u>



* CAR ... OUR DAILY FRIEND

NOT JUST INCREMENTAL EFFICIENCY GAINS...

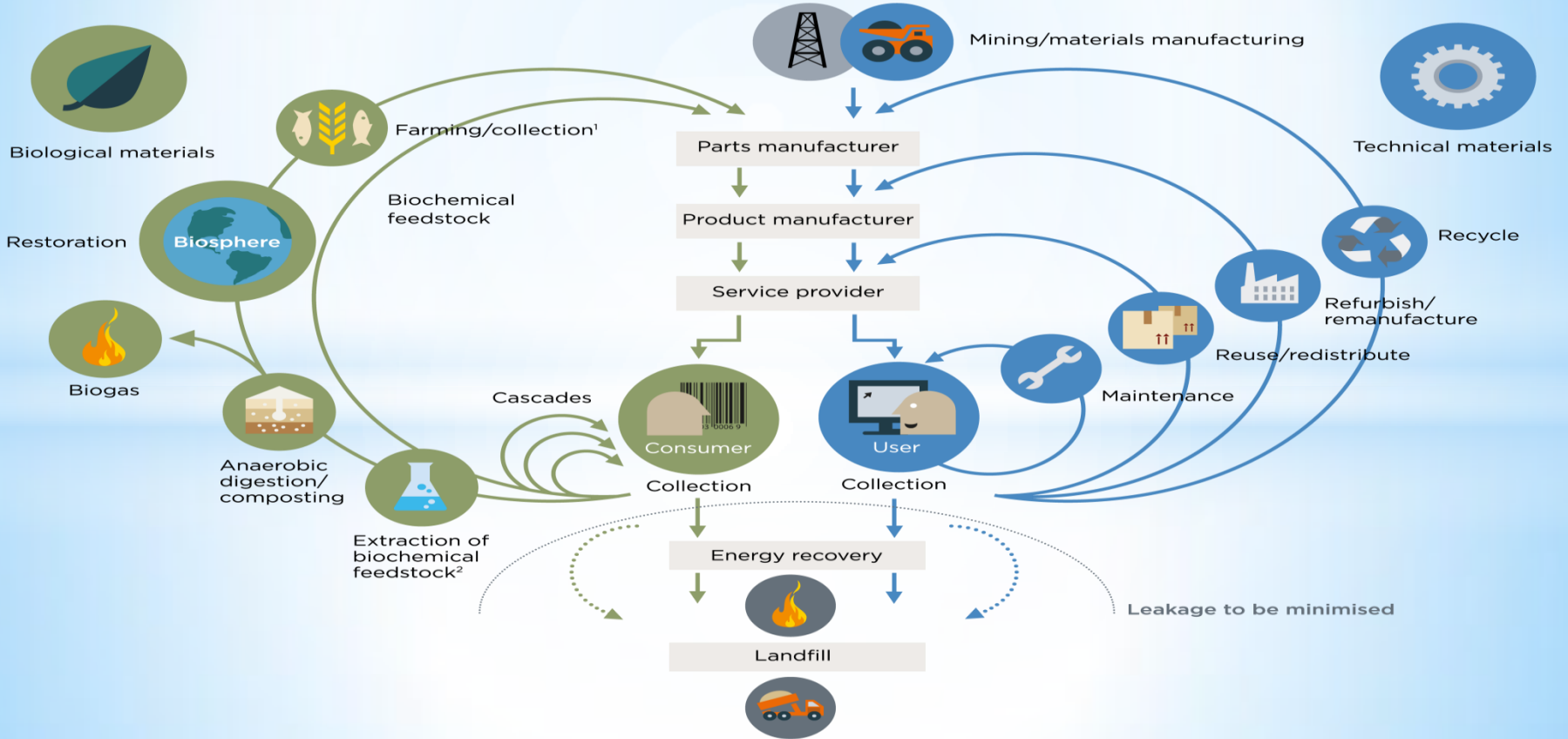
NOR NEW TECHNOLOGIES ONLY ...



Copyright: Tesla



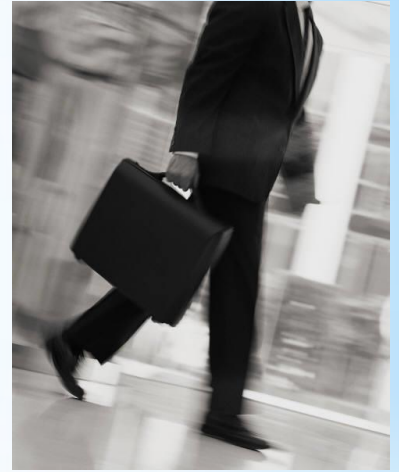
The circular economy—an industrial system that is restorative by design



¹ Hunting and fishing
² Can take both post-harvest and post-consumer waste as an input
 SOURCE: Ellen MacArthur Foundation - Adapted from the Cradle to Cradle Design Protocol by Braungart & McDonough



ROLE OF THE MARKETS: 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,**
- **IF MANAGERS ON ANNUAL CONTRACTS ARE INDUCED TO MAKE SHORT TERM INVESTMENT DECISIONS OVERLY INFLUENCED BY BONUSES BASED ON SHORT TERM SHARE PRICE,**
- **IF ...**



MARKETS AND REGULATION

- **INNOVATION (INCENTIVES)**
 - **PRODUCTS (DESIGN)**
 - **CONSUMERS (BEHAVIOUR)**
 - **BUSINESS MODELS**
-
- **YES ECO INDUSTRIES ARE IMPORTANT, BUT THE WHOLE ECONOMY HAS TO CHANGE**



* INTERNATIONAL DEVELOPMENTS



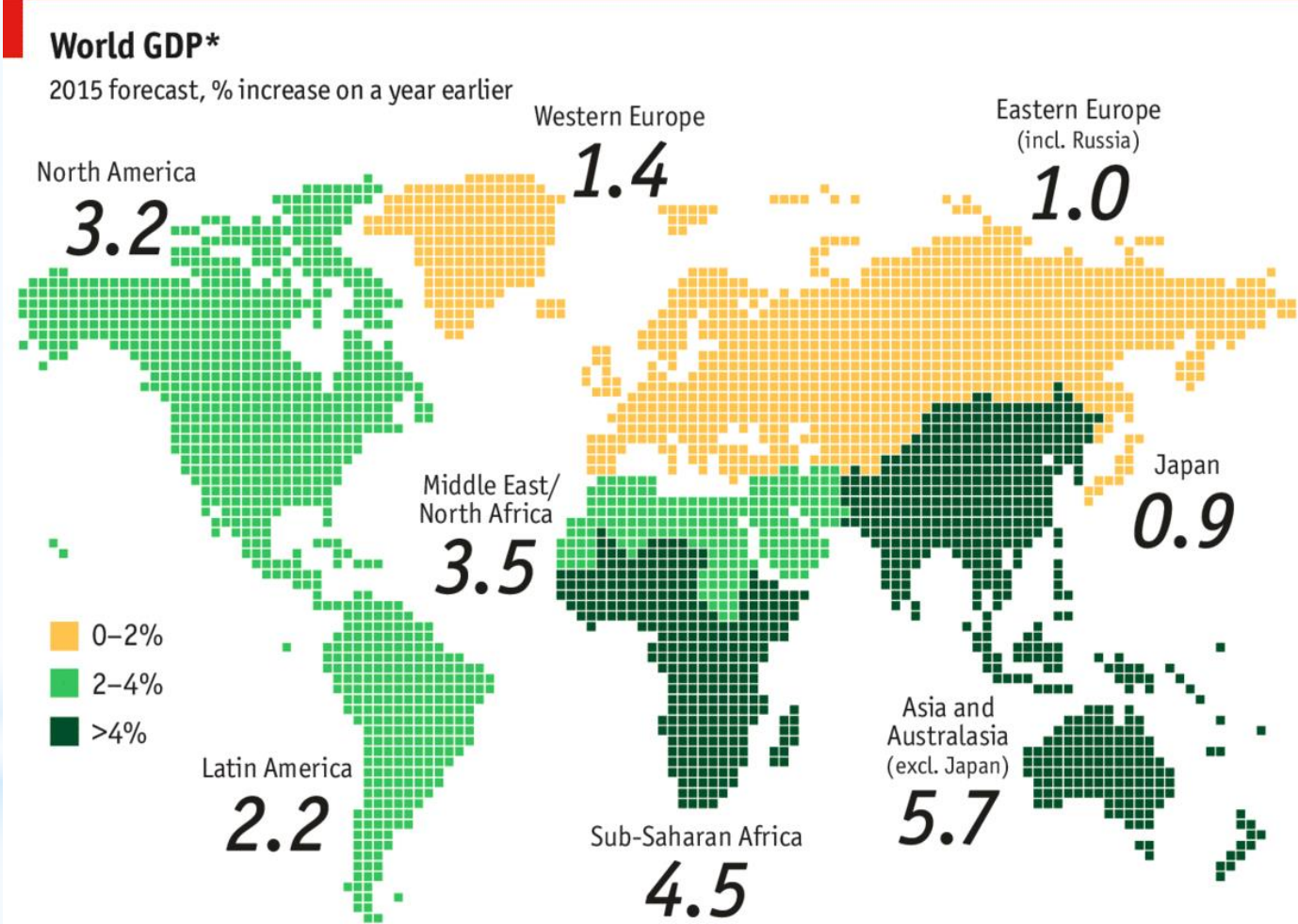
- **TRANSFORMATIVE AGENDA – NEW GLOBAL AGREEMENT BASED ON “NEW NORMAL” POVERTY ERADICATION AND SUSTAINABILITY (NEW YORK 2015)**
 - **RIO+20: AGREEMENT ON SDG’s**
 - **UN PROCESS : FROM MDG’s TO SDG’s AND POST-2015 AGENDA**
 - **OWG REPORT: 17 GOALS AND 169 TARGETS + INDICATORS**
 - **MEANS OF IMPLEMENTATION (FUNDING, GOVERNANCE, REPORTING)**
- **CLIMATE/ENERGY (USA AND CHINA, PARIS 2015)**

* AND EUROPEAN UNION ...

- **RESPONDING TO FINANCIAL CRISIS** IS NECESSARY, BUT NOT SUFFICIENT FOR ADDRESSING THE PROBLEMS OF GLOBALISATION AND ALSO IMPROVING COMPETITIVENES
- **OUR ANSWERS** ARE NOT ALWAYS APPROPRIATE (ENERGY PRICE OR ENERGY EFFICIENCY)
- **INTERNATIONAL CREDIBILITY** CAN ONLY BE GAINED BY ADEQUATE DOMESTIC POLICIES



**FROM
GROWTH&JOBS
TO
JOBS&GROWTH**



Source: Economist Intelligence Unit

*At market exchange rates

* SCIENCE – POLICY INTERFACE

- **SCIENCE** IS ABOUT “WHAT IS” (STUDYING, PRESENTING, COMMUNICATING THE FACTS OR EVIDENCE BASED ON CERTAINTY)
- **POLICY** IS ABOUT “WHAT OUGHT TO BE”
- **SCIENCE FOR POLICY MAKING** IS ABOUT PRESENTING THE OPTIONS, REDUCING THE SCOPE OF CHOICES FOR ACHIVING POLICY OBJECTIVES IN A DEMOCRATIC CONTEXT



TREND FROM DISCIPLINARY, TO MULTI-DISCIPLINARY AND
TRANS-DISCIPLINARY



* SCIENCE – POLICY INTERFACE

- **THE USE OF SCIENCE** - INTERNET, PARENTS, MEDIA, SCIENTISTS, DECISION-MAKERS, PRIVATE INTERESTS
- **THE INCONVINIENT TRUTH** - ENDOCRINE DISRUPTORS, CATALYSTS, INTERPRETERS, BROKERS, IMPACT ASSESMENT (SIMPLYSTIC VIEW ON COST AND BENEFITS)
- **THE LANDSCAPE OF DIVISIONS** – DISCIPLINES, DEPARTMENTS OF UNIVERSITIES, MINISTRIES, DGs ... EU - SOCIETAL CHALLENGES, EUROPEAN INNOVATION PARTNERSHIPS, EVEN WITH GOOD INTENTIONS IT IS NOT AN EASY TASK (A. EINSTEIN)



* **SCIENCE – POLICY INTERFACE**

**IT SEEMS THAT THE BEST WAY TO ATTRACT ATTENTION AND
STIR DEBATE OF BRUSSELS THESE DAYS IS TO WITHDRAW
OR SCRAP SOME INITIATIVES**



CHIEF SCIENTIFIC ADVISOR, CIRCULAR ECONOMY



**PROPSAL FOR ESTABLISHING IN A MORE STRUCTURAL WAY
SCIENTIFIC ADVISE FOR EU POLICY MAKING
MORE COMPREHENSIVE, BROADER PROPOSAL COVERING
NOT ONLY HALF, BUT THE WHOLE CIRCLE**

INTERNATIONAL POLICY NEEDS A SCIENCE BASE

The international resource panel was created in 2007 as a science-policy interface in responding to economic growth, escalating use of natural resources and deteriorating environment and climate change.



Climate Change

IPCC

Biodiversity Loss

IPBES

Hazardous Substances

Assessments under
the Basel
Convention

Ozone Depletion

Montreal Protocol's
Scientific
Assessments

Resource Efficiency

International
Resource Panel

* IPCC EXAMPLE

- IT IS INTERNATIONAL BY NATURE AND BY DEFINITION
- IT IS TRANS-DISCIPLINARY
- IT IS POLICY RELEVANT BUT NOT POLICY PRESCRIPTIVE
- IT GOES FOR BALANCE OF EVIDENCE APPROACH



**CREATE A CRITICAL MASS OF SCIENTIFIC KNOWLEDGE -
ADVISE THAT POLICY MAKERS CAN NOT IGNORE**

* IRP - FROM INDIVIDUAL RESOURCES TO SYSTEMS THINKING

INDIVIDUAL RESOURCES



Land and Soils



Water



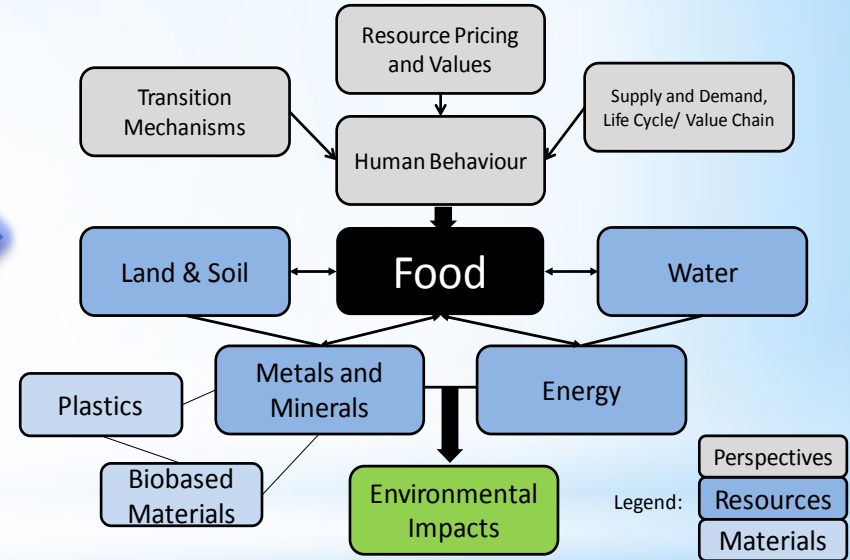
Environmental Impacts



Metals



SYSTEMS THINKING





TO CONCLUDE ...

21st CENTURY



FROM **FRAGILITY** TO **SUSTAINABILITY**
INCREASED **RESPONSIBILITY**
LEARN FROM **NATURE**

**ENVIRONMENTAL PROTECTION
IS NOT AN OBSTACLE TO
ECONOMIC GROWTH**

*** IT IS JUST THE OPPOSITE**

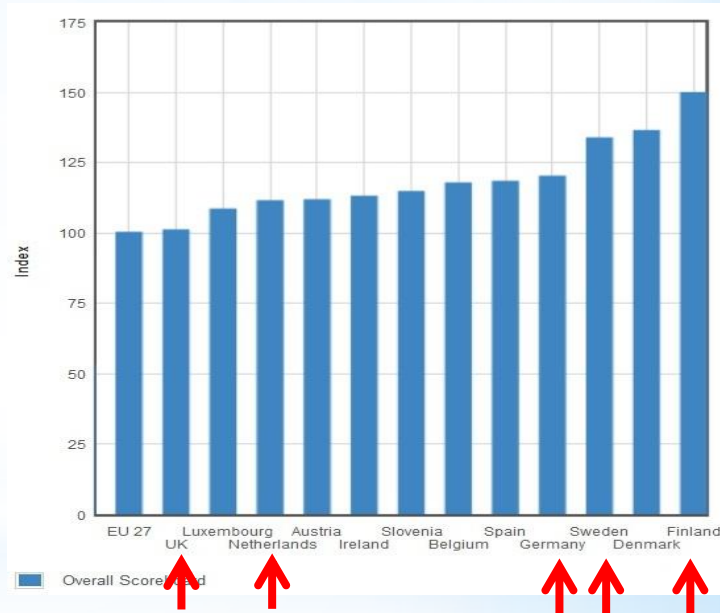
ECO INNOVATION AND COMPETITIVENESS

Finland, Germany and Sweden are highly competitive, and leaders in eco-innovation

Entity	Rank ▲	Score
2013-2014 » Global Competitiveness Index, 1-7 (best)		
Switzerland	1	5.67
Singapore	2	5.61
Finland	3	5.54
Germany	4	5.51
United States	5	5.48
Sweden	6	5.48
Hong Kong SAR	7	5.47
Netherlands	8	5.42
Japan	9	5.40
United Kingdom	10	5.37
Norway	11	5.33



Global Competitiveness Index 2013-2014



Eco-Innovation Index 2012

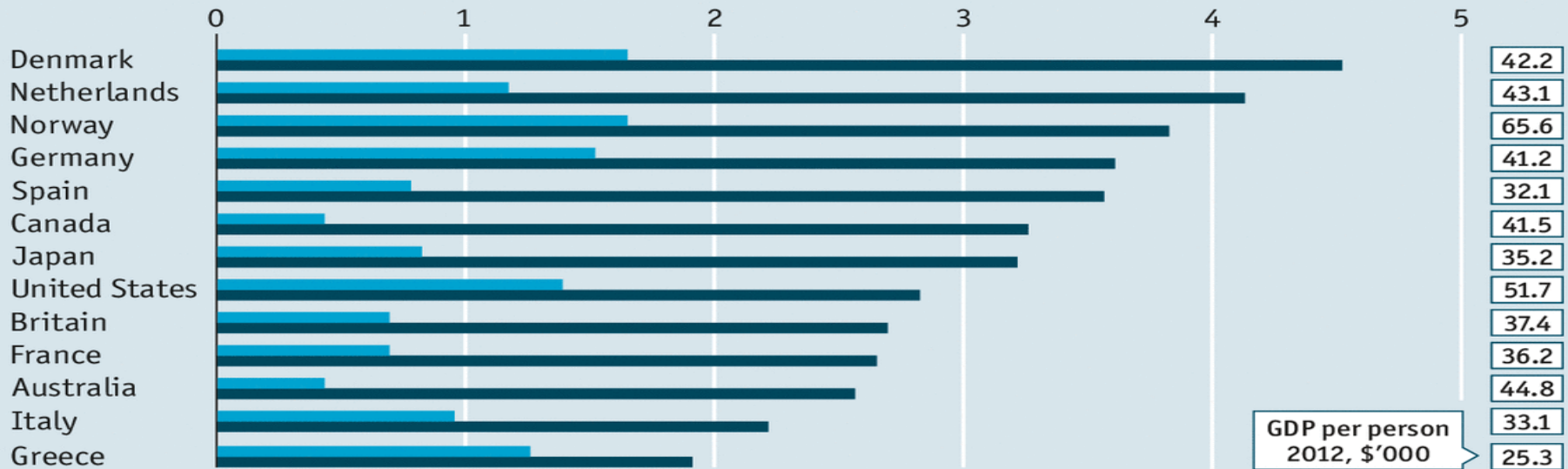
ENVIRONMENTAL REGULATIONS MAY NOT COST AS MUCH AS THOUGHT

Reduce, reuse, recycle

Environmental policies, whole economy indicator, 6=most stringent

1990-95

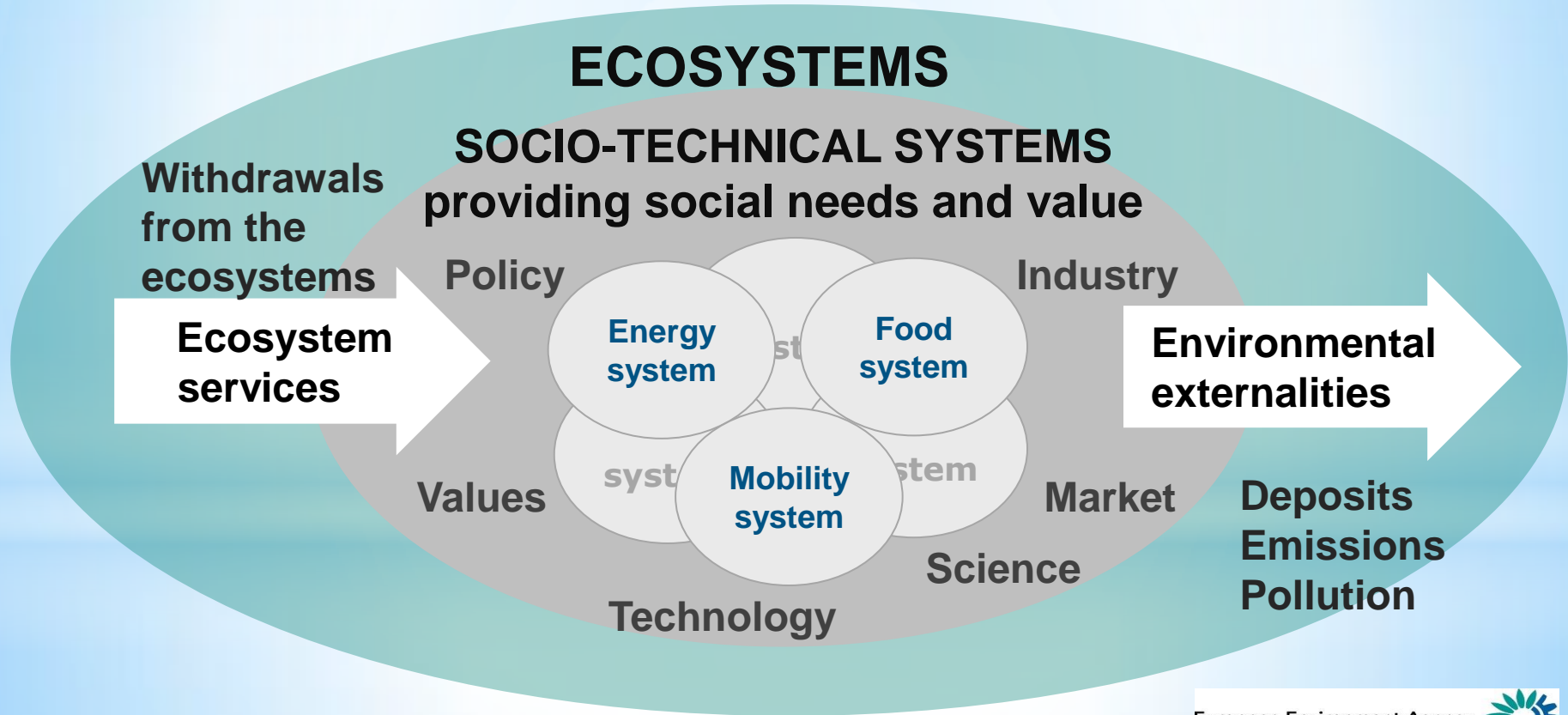
2012



Source: OECD

The Economist: January 3rd, 2015

LIVING WELL WITHIN ECOLOGICAL LIMITS



* MAIN OBSTACLES FOR CHANGE ...

HUMAN BEHAVIOUR - WHY WE ACT AT HOME IN A DIFFERENT WAY THAN WE DO IN OUR PUBLIC LIFE?

LACK OF LONG TERM CONSISTENCY – HOW TO STRENGTHEN LONG TERM STRATEGIC THINKING AND POLICY MAKING AND REPLACE PREVAILING SHORT TERM LOGIC?

FOCUS ON FINANCIAL SIDE OF ECONOMY - BUDGETARY DEFICIT VERSUS THE STRUCTURE, COMPARISON COMPANY - COUNTRY

PROTECTING STATUS QUO - HOW TO BREAK LOCK-INS AND THE LOGIC OF DEFENDING THE LOWEST COMMON DENOMINATOR APPROACH?

GOVERNANCE AND LACK OF IMPLEMENTATION: HOW TO TRANSLATE COMMITMENTS FROM POLITICAL STATEMENTS TO A DAILY REALITY ?

SILOS MENTALITY - HOW TO MAKE PEOPLE UNDERSTAND THAT COOPERATION IS THE BEST WAY FOR ALL OF THEM TO WIN?

* **CHANGE** IS

UNAVOIDABLE

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



ENVIRONMENT ECONOMY





***THANK YOU**

www.unep.org/resourcepanel