Climate action and resource efficiency

OPEN INNOVATION

Boost private investments

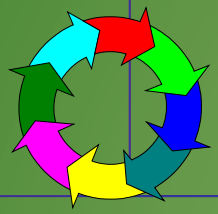
Maximise impact

Regulatory reforms

OPEN SCIENCE

Openness

Research integrity



OPEN TO THE WORLD

Global Research Areas

Specific initiatives

The WP2017

Climate action
- Climate services
- Low-carbon Europe
- Arctic dimension

Systemic eco-innovation for a circular economy

Nature-based solutions:
- for territorial resilience
- for sustainable cities

Raw materials

Mainstreaming water R&I

Sustainable growth by harnessing:
- Earth observation data
- Cultural heritage

Implementation of the SDGs – international cooperation

OPEN INNOVATION

Boost private investments

- Shape and co-create the markets of the future
- InnovFin Advisory on circular economy

Maximise impact

- Emphasis on large-scale demonstrators to gather evidence on investment effectiveness (e.g. sharing risks in testing innovative solutions in real world conditions i.e. living labs), also mobilizing more private investment
- Focusing on selected high-impact priorities: green growth, circular economy, climate services, raw materials, decarbonisation, nature-based solutions, water, cultural heritage
- Systemic user-centric, and trans-disciplinary approach to enlarge the stakeholders community
- Exploiting digital and physical integration

Regulatory reforms

- InnovRefit/Innovation deals

OPEN SCIENCE

Openness

- Global Earth Observation System of Systems (GEOSS). To develop a comprehensive and sustained global environmental observation and information system. Management of big data on an open and free global data sharing principle agreement
- Establishment of long-term sustainable data platforms securing open access and interoperability along data infrastructures for robust evidence to facilitate policy making and assessment of investment effectiveness (NBS for sustainability and coherence)
- Stakeholder engagement and co-design with scientific communities (e.g. decarbonisation initiative)

Research integrity

- Best practices for co-design, co-development and co-implementation

OPEN TO THE WORLD

Contributing to political processes

- Science , Technology and innovation for the 2030 Sustainable Development Agenda (SDGs)
- Support to our commitment to international bodies and organisations, such as IPCC and GEO
- Participating in the CBD, UNISDR etc.

Specific initiatives

- Promoting multi-lateral cooperation for solution-oriented, transdisciplinary research: Belmont Forum, Future Earth
- PRIMA (a possible Art.185) to ensure the resilience of food systems and water resources in the Mediterranean area
- Transatlantic cooperation on the Arctic
- Sustainable Cities and NBS with international partners and China
- Climate services and sustainable urbanisation in Latin America with DEVCO

A concept underpinning the WP2017:

Sustainability and Innovation

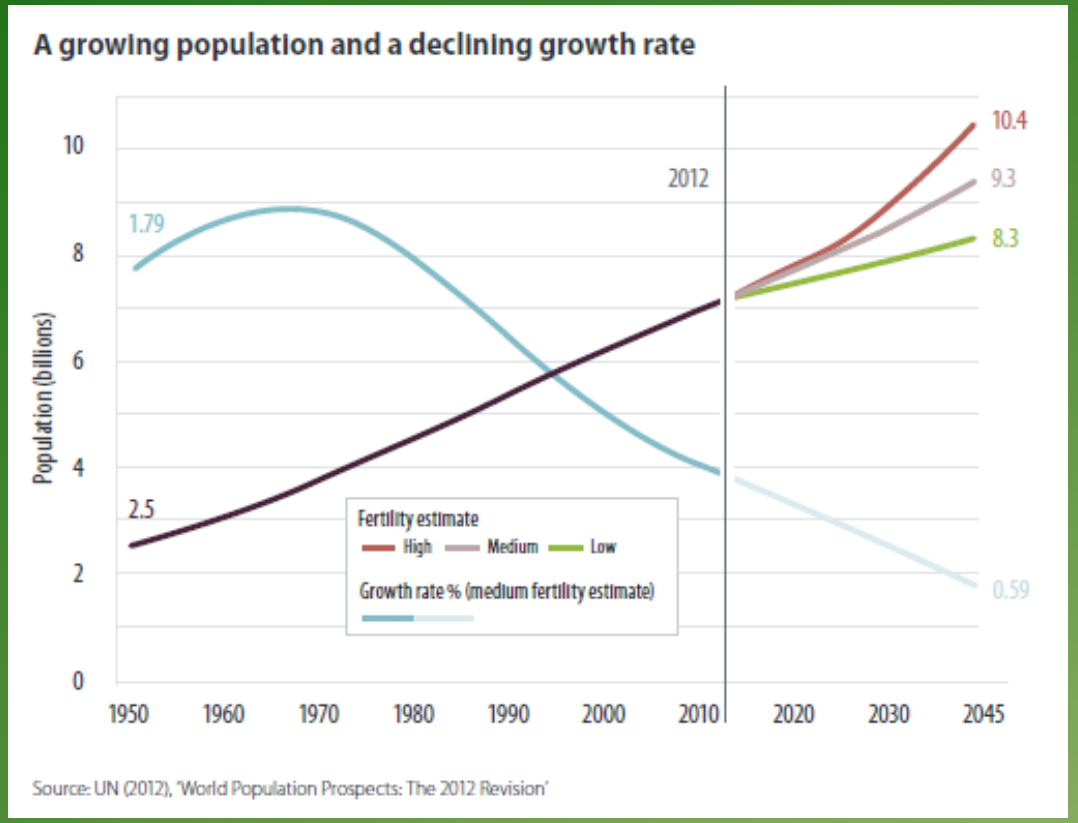
a stimulus and not a constraint

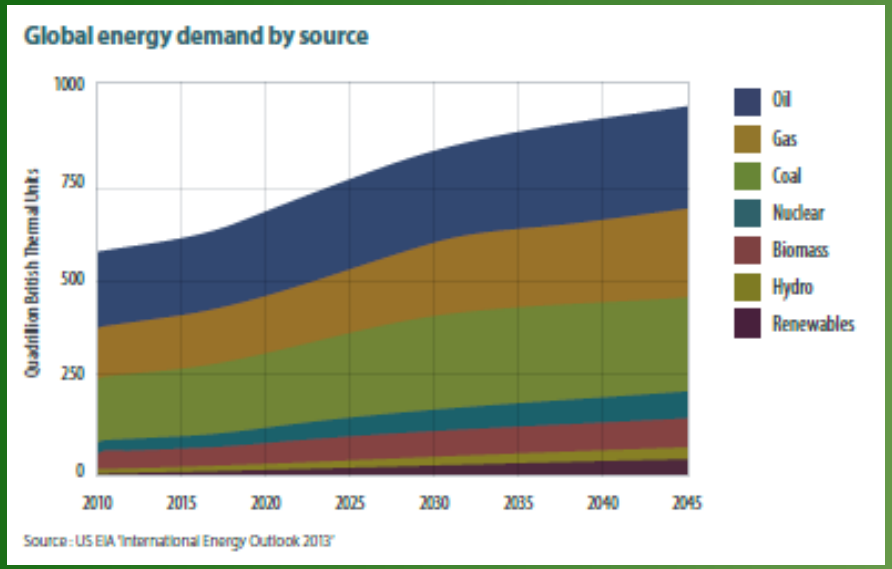
to economic growth

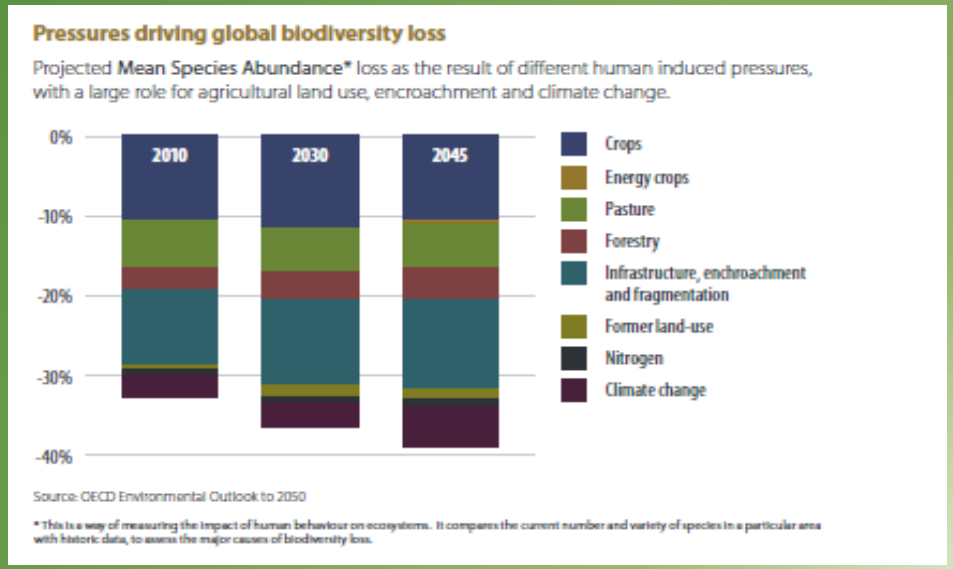
and creation of new jobs

in Europe

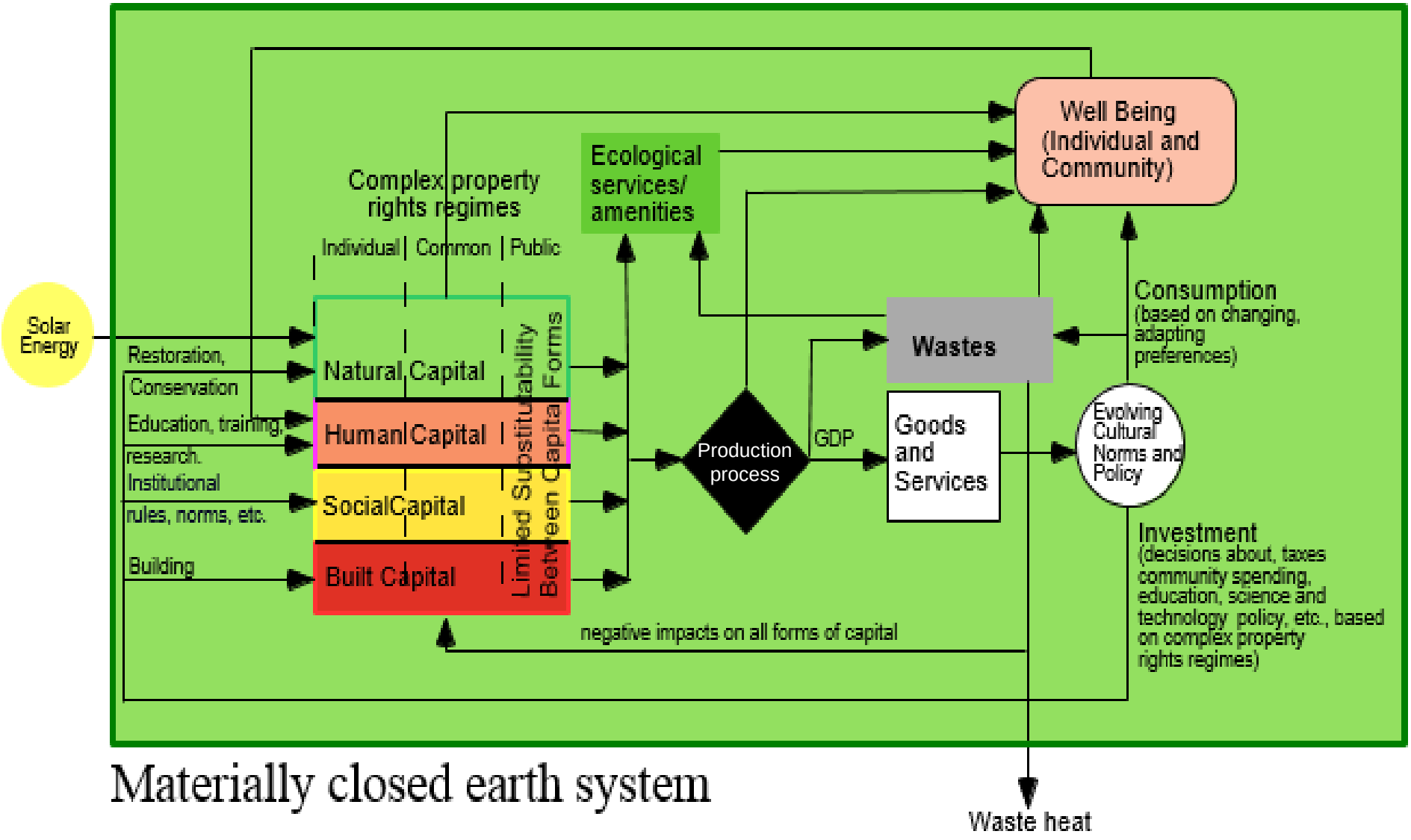
Trends: ...


A growing population and a declining growth rate
Population (billions)
10
8
6
4
2
0
1950
1960
1970
1980
1990
2000
2010
2012
2020
2030
2045
1.79
2.5
10.4
9.3
8.3
0.59
Fertility estimate
High
Medium
Low
Growth rate % (medium fertility estimate)
Source: UN (2012), 'World Population Prospects: The 2012 Revision'


Global energy demand by source
Quadrillion British Thermal Units
1000
750
500
250
0
2010
2015
2020
2025
2030
2035
2040
2045
Oil
Gas
Coal
Nuclear
Biomass
Hydro
Renewables
Source : US EIA 'International Energy Outlook 2013'


Pressures driving global biodiversity loss
Projected Mean Species Abundance* loss as the result of different human induced pressures, with a large role for agricultural land use, encroachment and climate change.
0%
-10%
-20%
-30%
-40%
2010
2030
2045
Crops
Energy crops
Pasture
Forestry
Infrastructure, enchroachment and fragmentation
Former land-use
Nitrogen
Climate change
Source: OECD Environmental Outlook to 2050
* This is a way of measuring the impact of human behaviour on ecosystems. It compares the current number and variety of species in a particular area with historic data, to assess the major causes of biodiversity loss.

Our system is not so open….



Source: prof. Enrico Giovannini

1. A "green trajectory" is already happening and will accelerate worldwide (see the SDGs, Paris Agenda, Mission Innovation etc.)

2. Europe is today well-positioned and can profit of a competitive advantage for the export (or co-creation) of green/clean/low carbon technologies: we act now or we miss the opportunity

3. Research and innovation is key to develop new economic-environmental-socially sustainable solutions, via ambitious long-term research and rapid innovation cycles

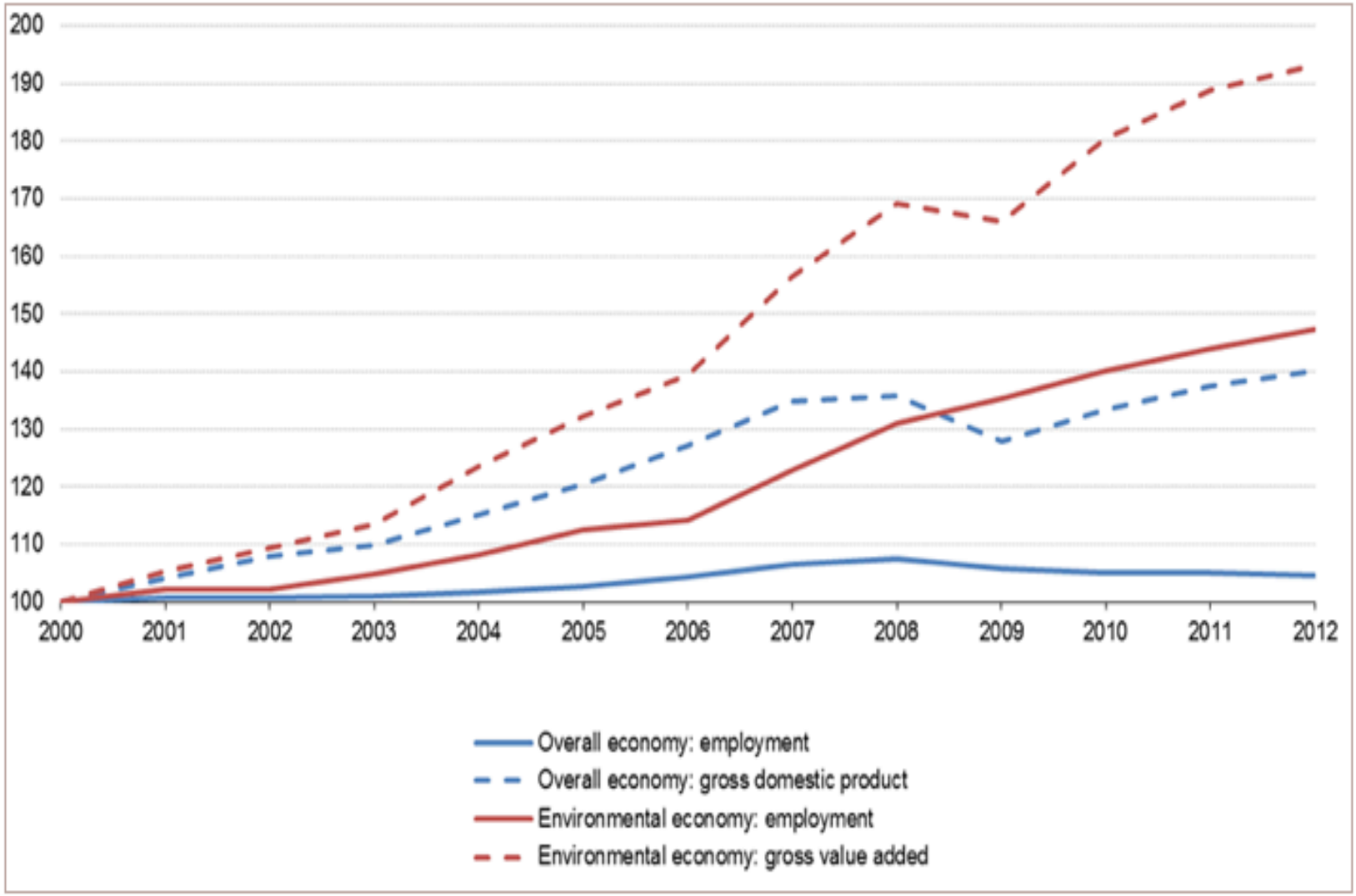
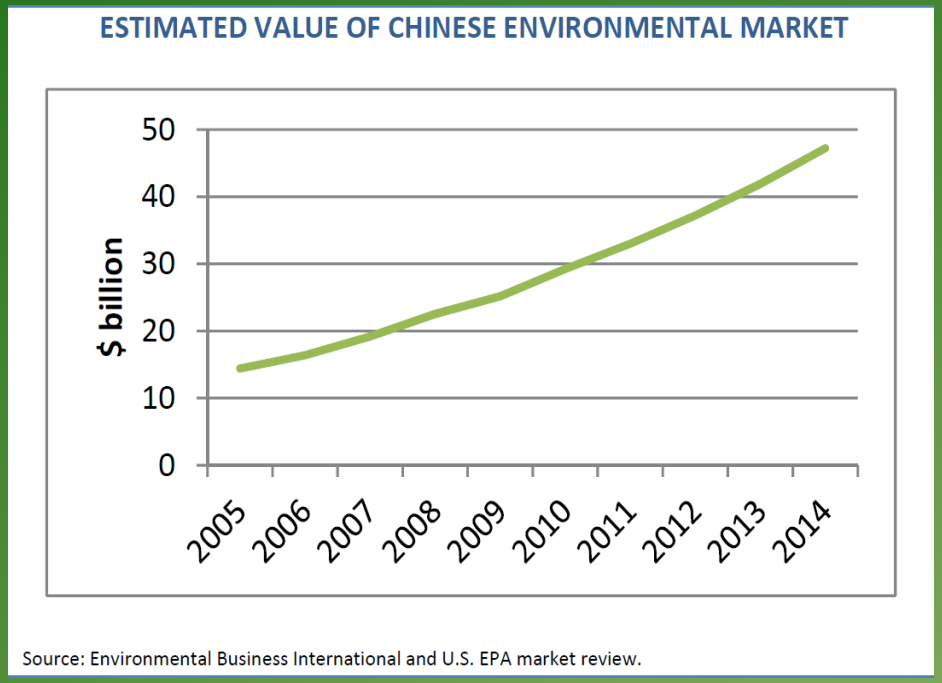
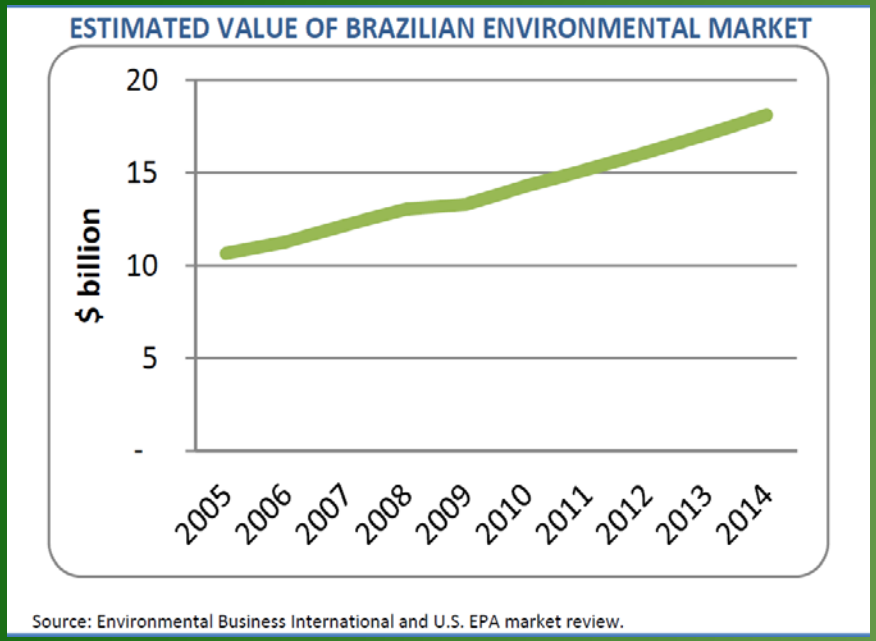


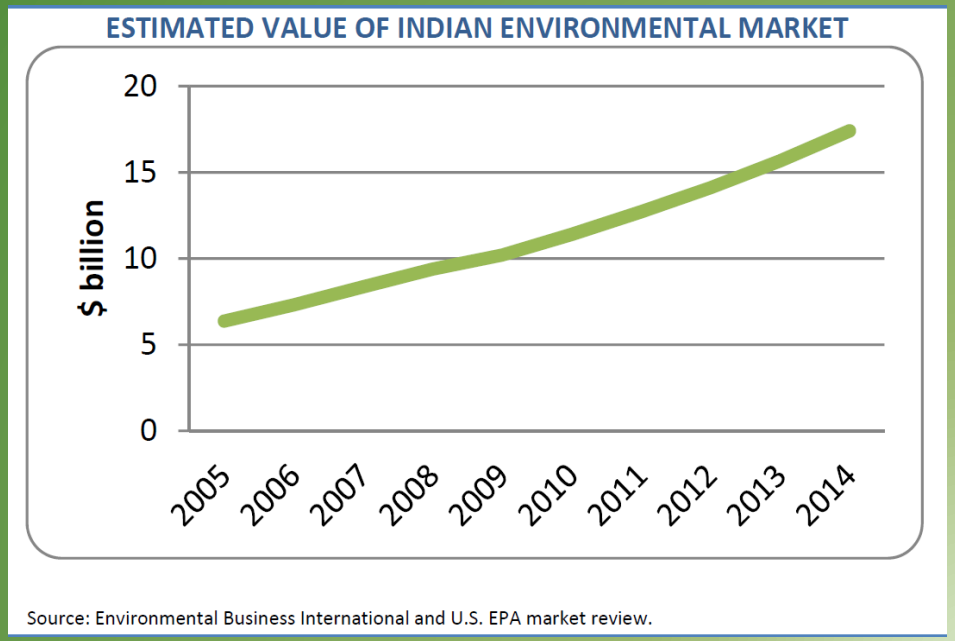
Figure 1 Development of key indicators for the environmental economy[1] and the overall economy, EU-28, 2000–12 (2000=100), Eurostat estimates

Source: Eurostat (online data codes: env_ac_egss1, env_ac_egss3, nama_10_pe and nama_gdp_c)

This "green trajectory" is an emerging and powerful trend in the economy







Cost Savings

+

Demand from Customers

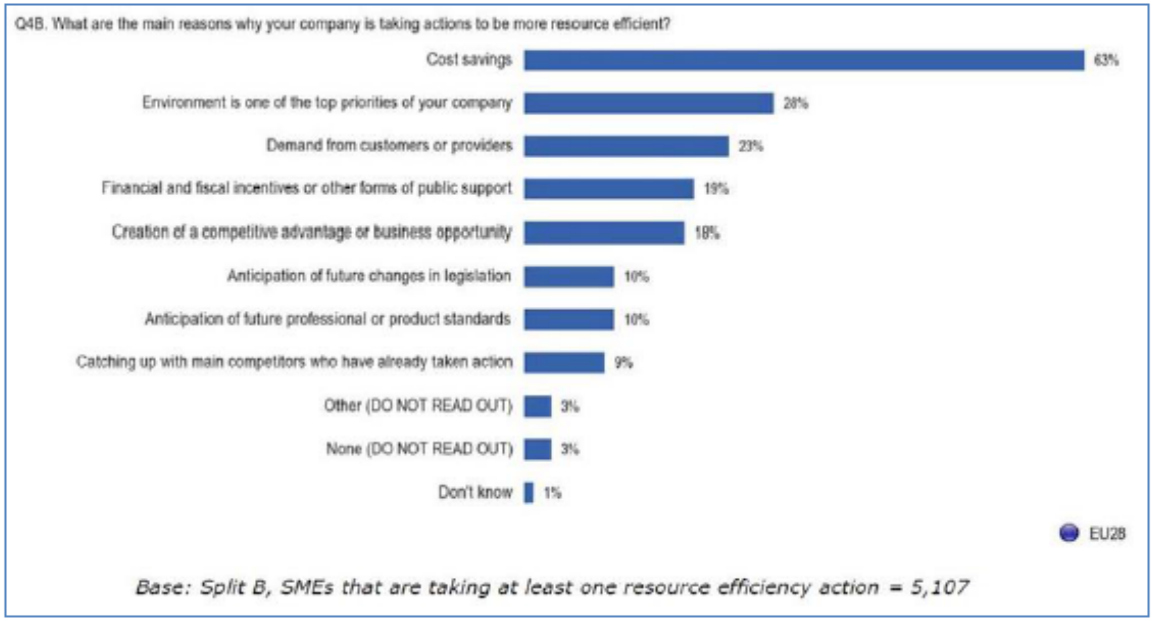


Figure 3 What are the main reasons why your company is taking actions to be more resource efficient? Results for EU28, SMEs that are taking at least one resource efficiency action, n=5,107

Source: Eurobarometer SMEs, Resource Efficiency and Green Markets, 2013

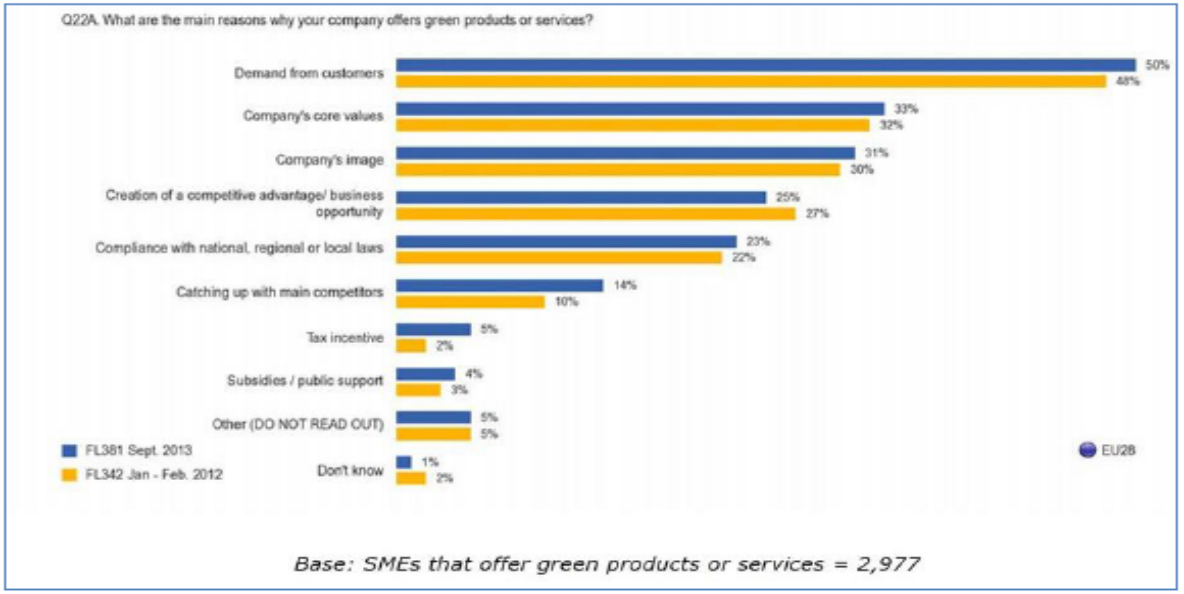


Figure 2 What are the main reasons why your company offers green products or services?, Base: EU28, 2012-2013, SMEs that offer green products or services = 2,977

While jobs and profitability of traditional mass production activities are declining, there is a rapid growth of jobs and profitability in businesses that provide products and services to support healthy lifestyles and sustainability

The new green lifestyles are creating new markets domestically and are likely to gradually entice the new millions joining the middle classes across the world

Markets are effective when there is a clear potential to exploit and develop profitability

History teaches us that to take advantage of a major shift in technologies, significant and systemic institutional innovations are required

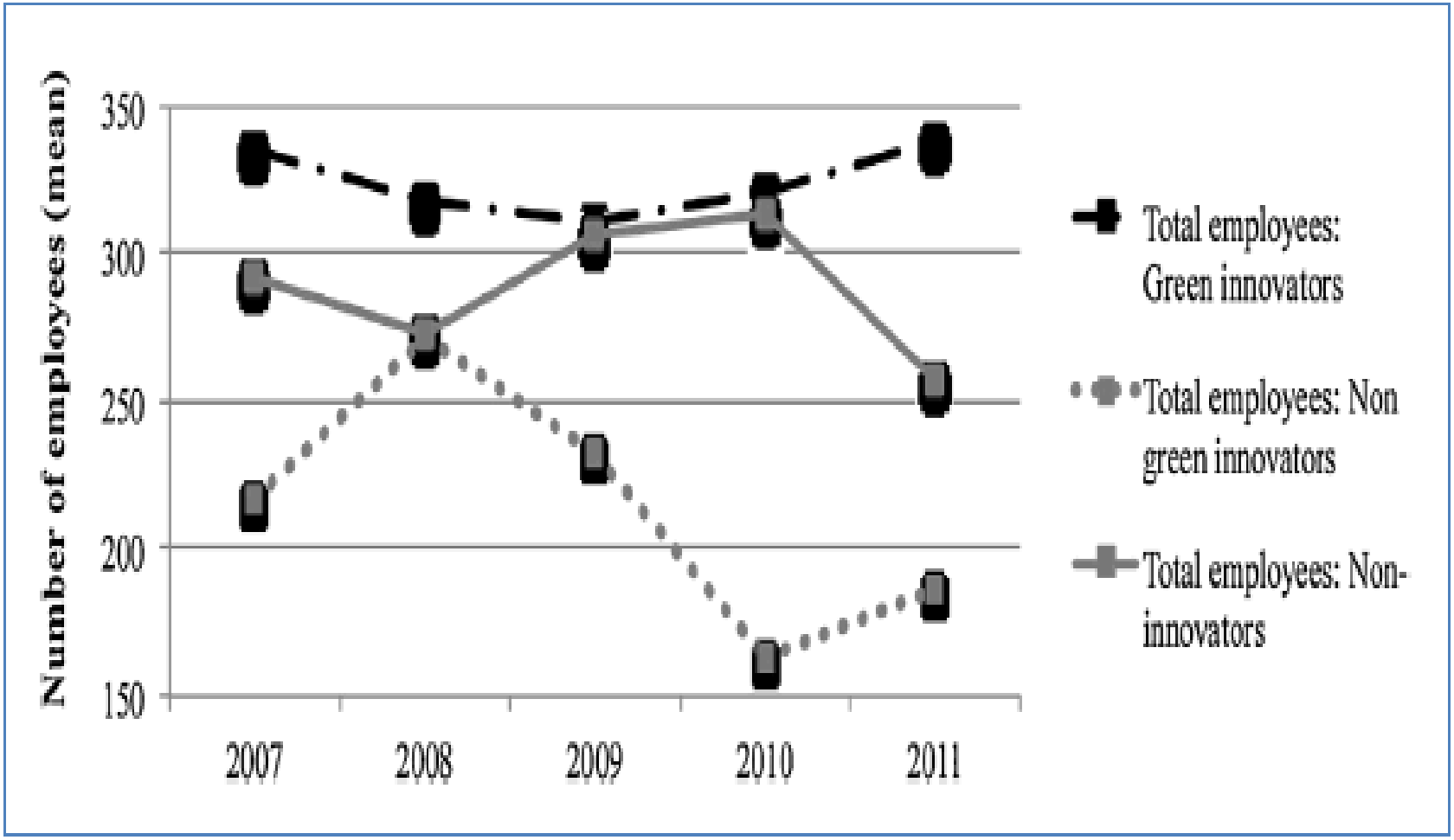


Figure 7: Average number of total employees and R&D personnel by type of firm

Source: Kunapatarawong, R. and Martínez-Ros, E, (2016)[31]

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- There is a huge opportunity for Europe to ride this “green” trajectory and turn environmental problems into solutions for promoting investments and jobs
- Europe is well positioned but a lack of investment and stimuli will be understood as unattractiveness

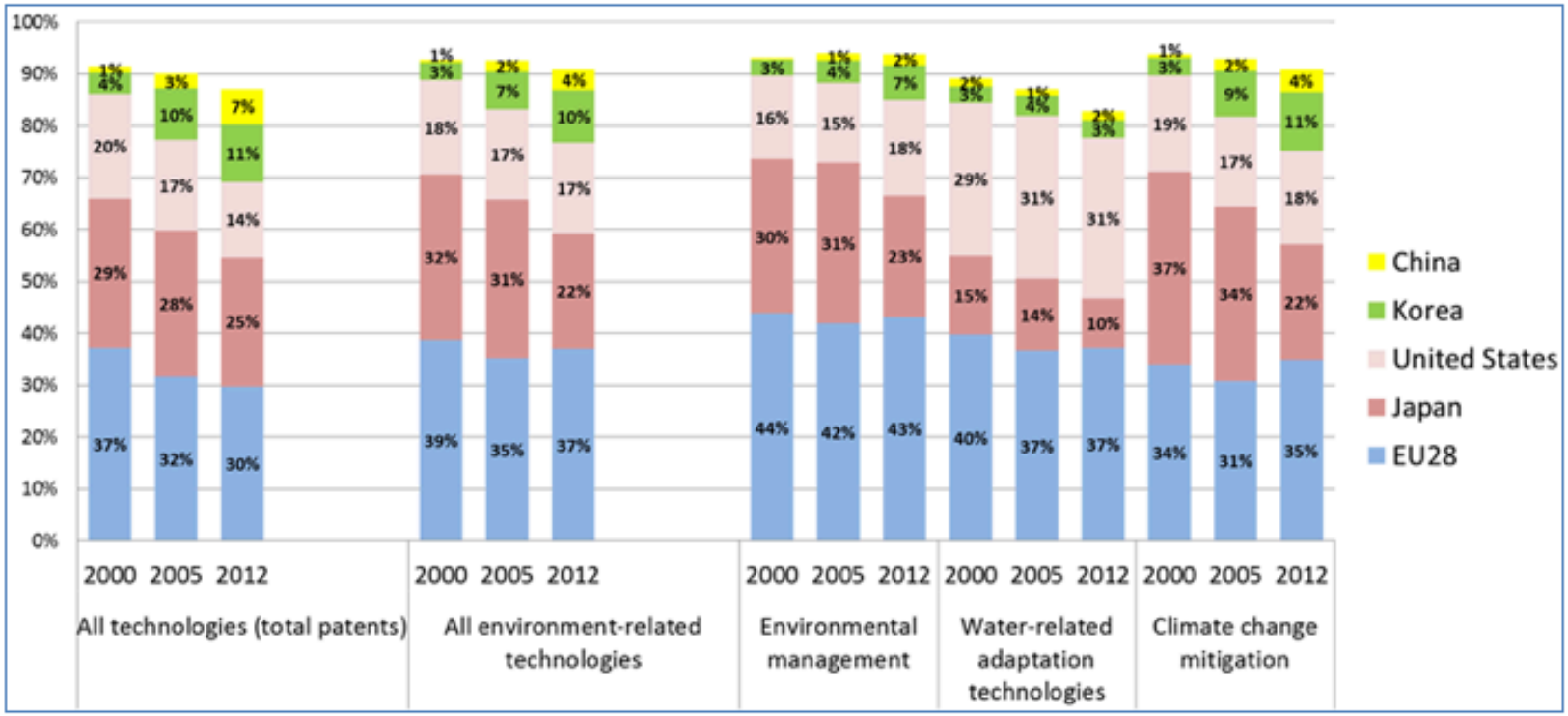


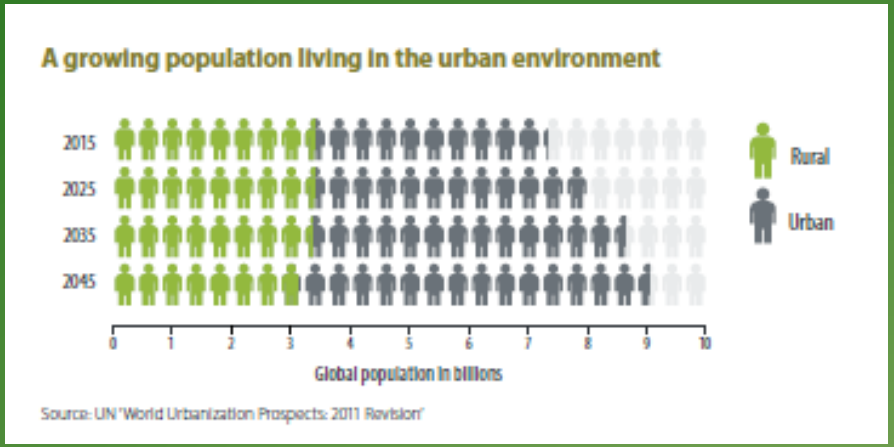
Figure 5 Evolution of World's share in technology development, total and environment-related technologies, 2000, 2005 and 2012, patent family size ≥ 2, fractional counts by country of residence of the inventor(s)

Source: OECD data treated by EC, DG RTD

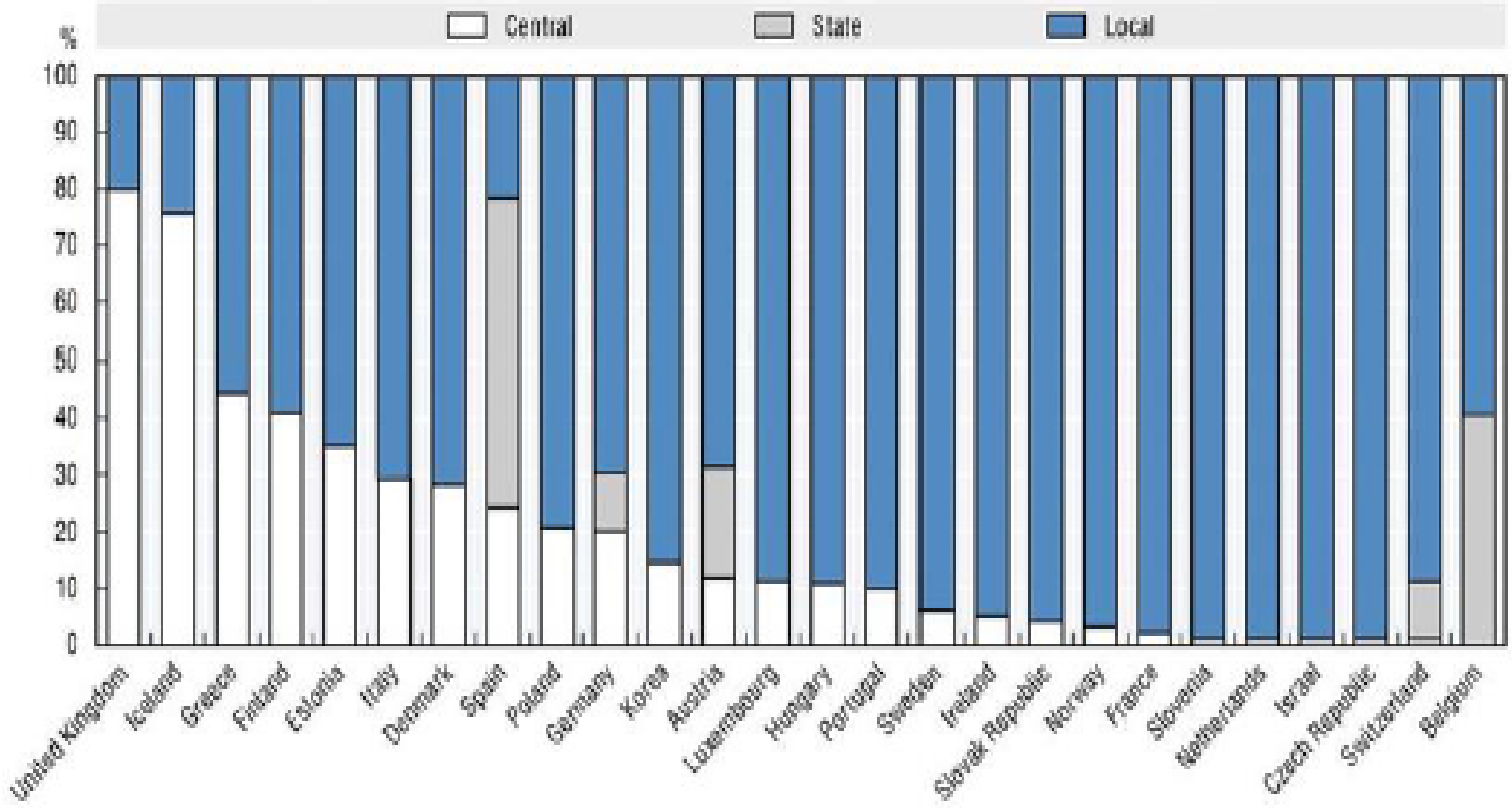
The way ahead:

- Sustainability for Competitiveness
- A full alignment in policies is required and implies:
  - *Participatory and consensual policy formulation*
  - *Coherent and convergent regulation and fiscal policies*
  - *Empowering cities and regions for smart synergistic action in a green direction*
  - *Commitment of public funds at all levels for green-related infrastructure R&D and investment giving signals to encourage private funds*
  - *Updating skills policy in the direction being promoted*

Why empowering cities and regions for smart and local specialisation?



- The transition to new economic arrangements has been successful at the regional or urban level, where a regional or city administration co-ordinate policy and infrastructural change
- Local, regional and national examples show the effectiveness of public policy
- Effective convergence that makes the best of local differences and create value chains



Note: State government data only for Austria, Belgium, Germany and Spain.

Source: OECD, *National Accounts Database*, April 2014, http://data.oecd.org/, based on OECD (2013a), *Regions at a Glance*, OECD Publishing, Paris, http://dx.doi.org/10.1787/reg_glance-2013-en.

Figure 9. Gross capital formation in environmental protection by level of government, 2012

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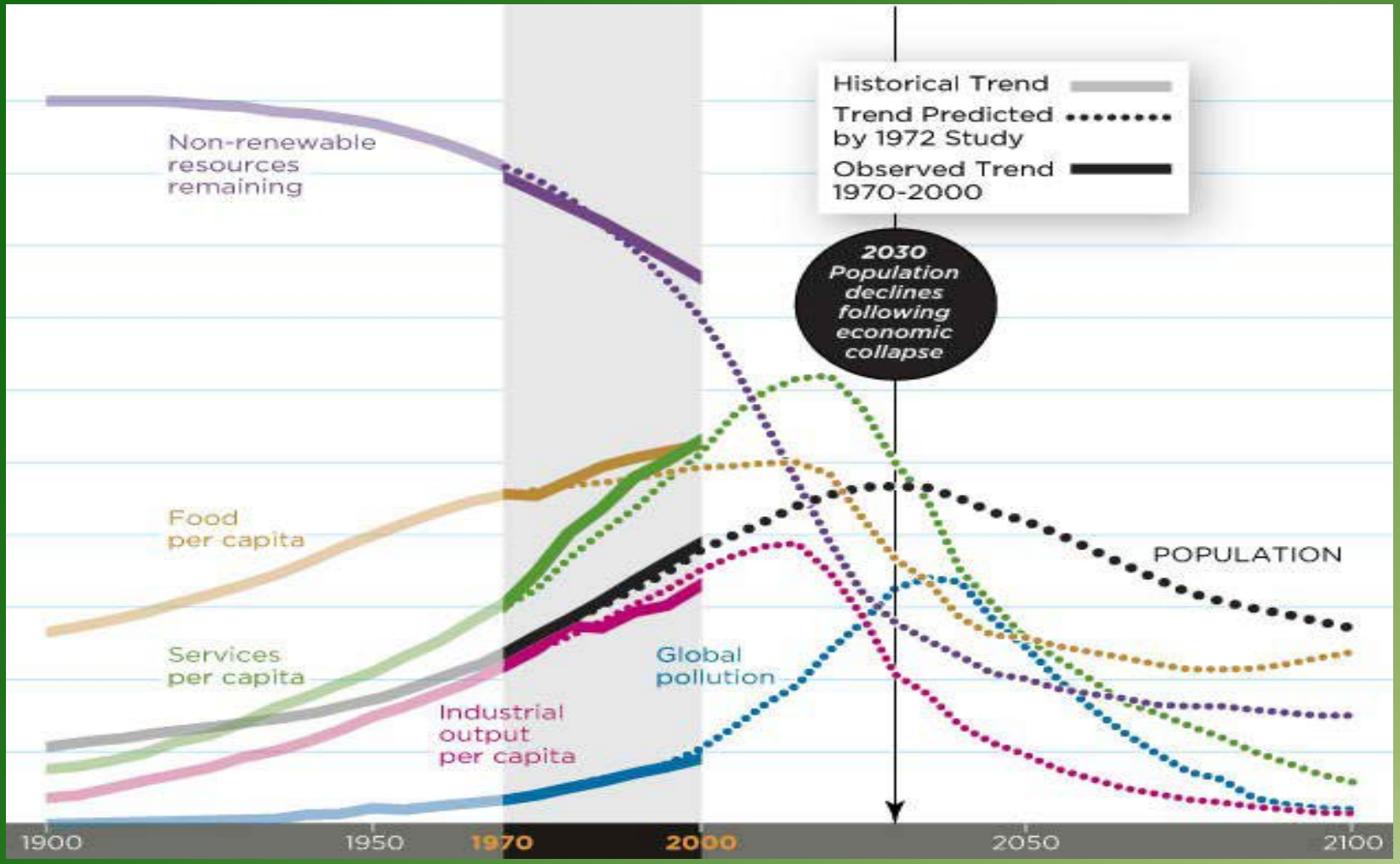
Why making significant infrastructural and R & I investment now?

Two main reasons:

- The urgent and immediate need to overcome the recession and to avoid the next collapse that many are predicting

- The importance to create conditions necessary to enhance the attractiveness and competiveness of the European territories for investment and innovation in the growth of the future

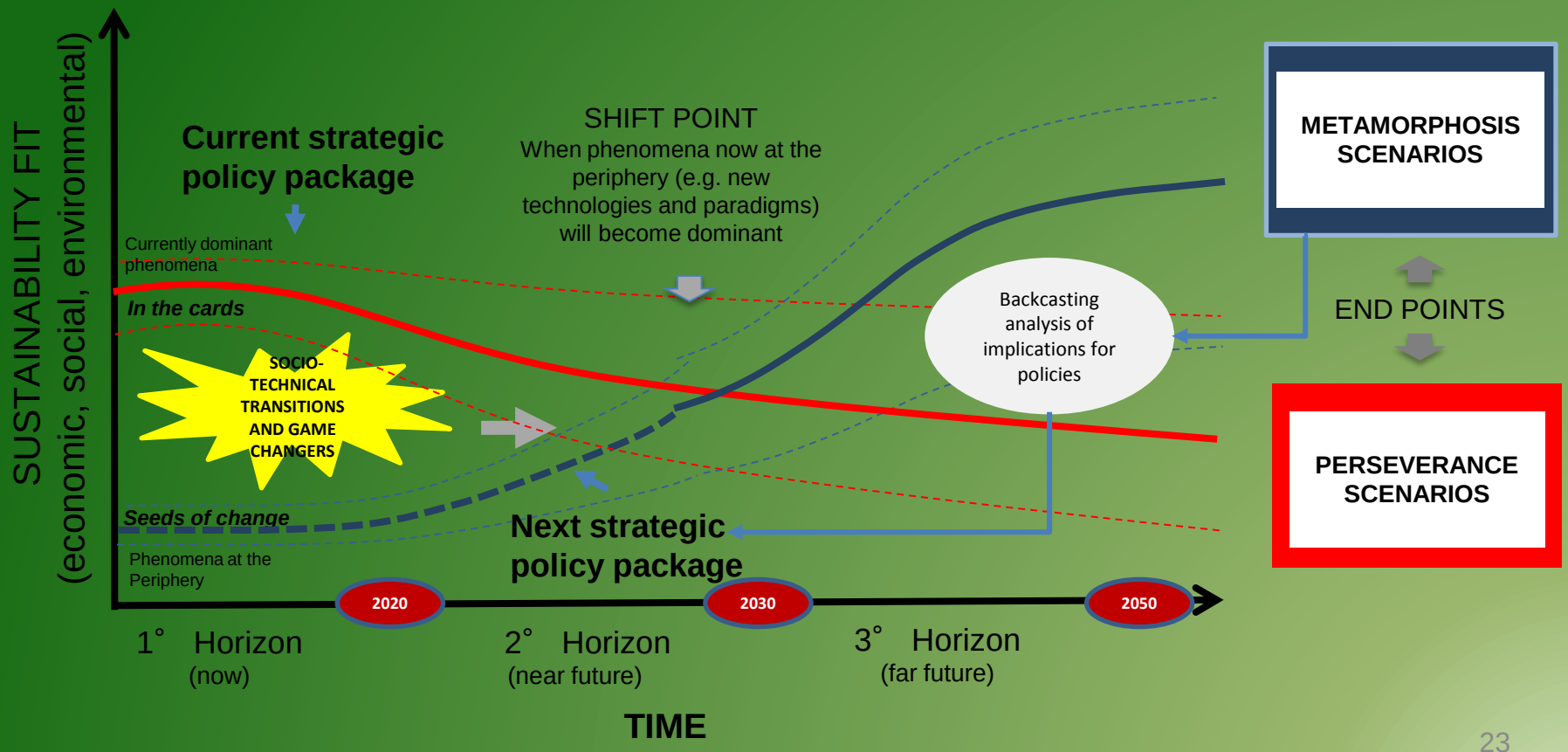
The future we DO NOT want



Source: prof. E. Giovannini

Forward Looking in transition times …

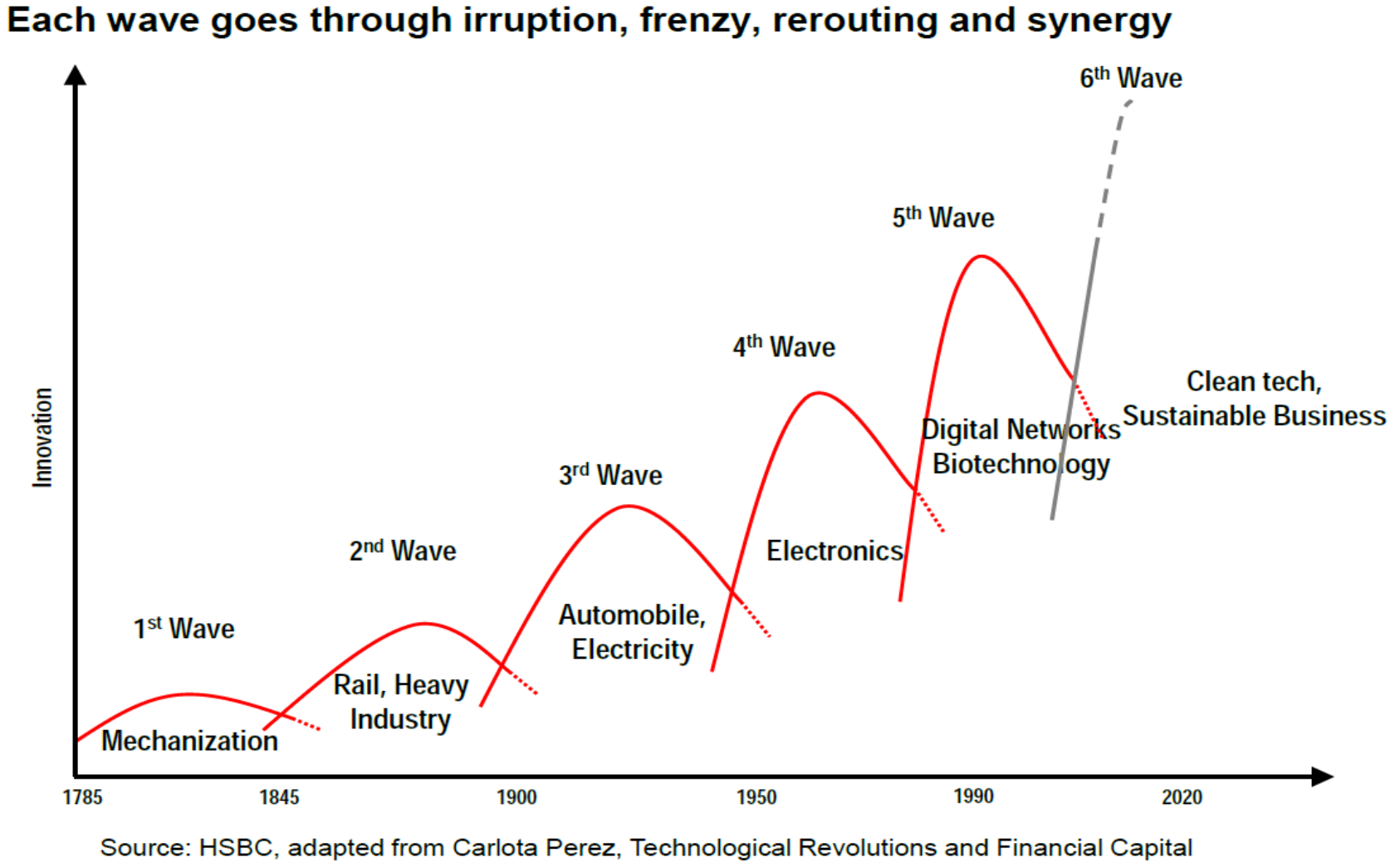
FORWARD LOOKING FRAMEWORK – THREE HORIZONS MODEL PLOT



A. Ricci – 11.05.2016

FLAGSHIP
Forward Looking Driving Change

Sustainability for competitiveness !



Two high-level panels' reports have been published:

One expressed the opinion that (and provided evidence about) **“sustainability is an opportunity”**:
http://bookshop.europa.eu/en/changing-gear-in-r-i-pbKI0216237/?CatalogCategoryID=7QwKABstDHwAAAEjK5EY4e5L

The other dealt with the role of **science, technology and innovation to achieve the SDGs**:
http://bookshop.europa.eu/en/the-role-of-science-technology-and-innovation-policies-to-foster-the-implementation-of-the-sustainable-development-goals-sdgs--pbKI0415809/?CatalogCategoryID=Gj0KABst5F4AAAEjsZAY4e5L

If one meets legislative obstacles to innovate, **tomorrow** is the deadline for submitting expressions of interest for the innovation deals: https://ec.europa.eu/research/innovation-deals/index.cfm

HLP report

"Changing Gear in R&I: Green Growth for Jobs and Prosperity in the EU"

http://bookshop.europa.eu/en/changing-gear-in-r-i-pbKI0216237/?CatalogCategoryID=7QwKABstDHwAAAEjK5EY4e5L

Name	Nationality	Present position
Carlota Perez *(Chair)*	VE/UK	Centennial Professor, London School of Economics; Professor of Technology and Development at the Nurkse Institute. Technological University of Tallinn, Estonia; Honorary Professor, SPRU, University of Sussex, UK
Pier Vellinga *(Vice Chair)*	NL	Professor in Climate Change and Societal Implications at Wageningen University and Vrije Universteit Amsterdam, Co-initiator and early Bureau Member of IPCC.
Christian Hudson *(Rapporteur)*	UK	Senior Fellow at Ecologic Institute.
Nathalie Girouard	CA	Coordinator for OECD work on green growth and sustainable development
Reinhilde Veugelers	BE	Full professor at the Department of Management, Strategy and Innovation at KU Leuven.
Giulia Gregori	IT	Head of Strategic Planning and Corporate Communication at Novamont SpA
Paweł Kawalec	PL	Director of The Institute of Theoretical Philosophy at KU Lublin
Steven Stone	US/FR	Chief of UNEP's Geneva-based Economics and Trade Branch
Carmen Marchiori	IT	Lecturer in Environmental Policy and Economics. Department of Geography and Environment of London School of Economics
Martin Faulstich	DE	Professor of Environmental and Energy Technology at Clausthal University of Technology and director of the CUTEC Institute of Environmental Technology
Philippe de Buck	BE	Member of the European Economic and Social Committee and former Director General of Business Europe
With the contribution of:		
Marianne Fay	US	Chief Economist of the Climate Change Group at the World Bank

HLP Report

The role of science, technology and innovation policies to foster the implementation of the sustainable development goals (SDGs):

Report of the expert group “Follow-up to Rio+20, notably the SDGs”

- Enrico Giovannini
- Ingeborg Niestroy
- Måns Nilsson
- Françoise Roure
- Michael Spanos

http://bookshop.europa.eu/en/the-role-of-science-technology-and-innovation-policies-to-foster-the-implementation-of-the-sustainable-development-goals-sdgs--pbKI0415809/?CatalogCategoryID=Gj0KABst5F4AAAEjsZAY4e5L

Thank you for your attention