



Eco-innovation: trends, barriers and drivers experience of EU and transition economies

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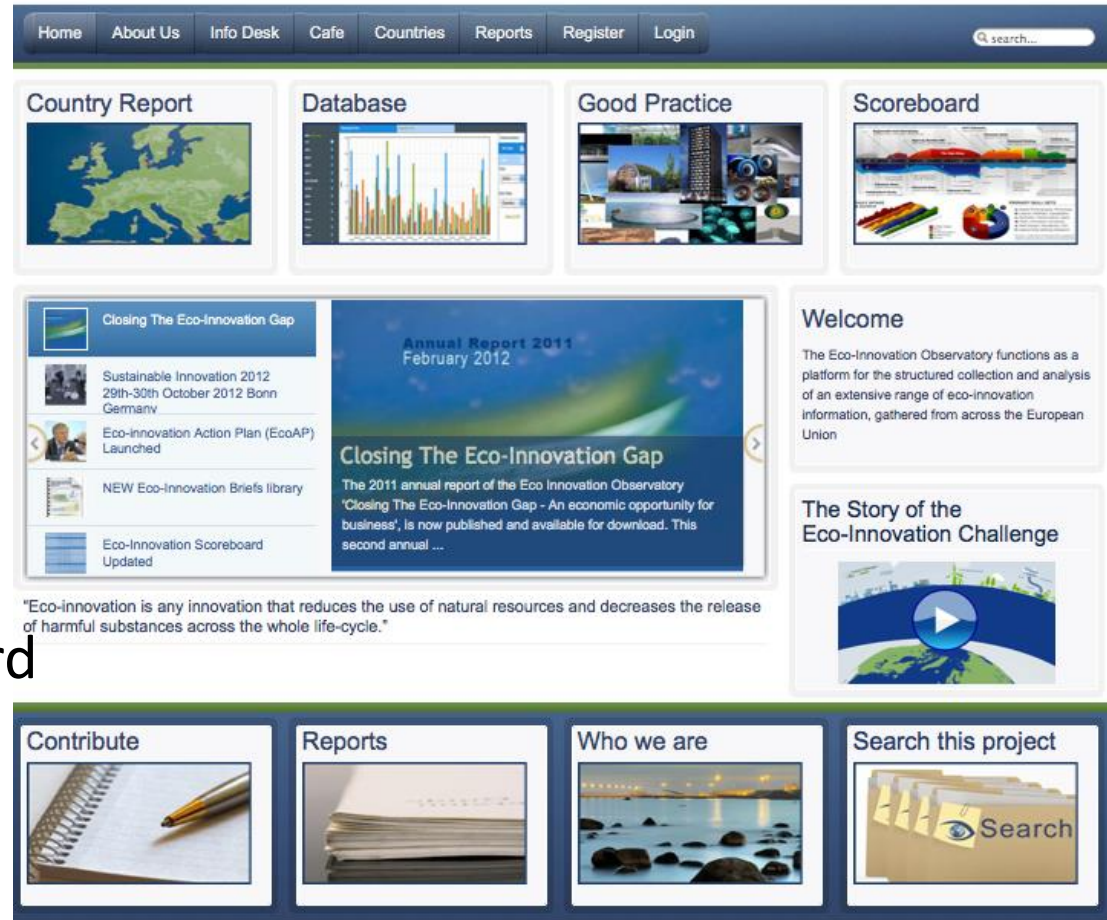
Technopolis Group and Eco-Innovation Observatory

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The Eco-Innovation Observatory

- Information platform and evidence on eco-innovation for business, policy and researchers
- Analysis of the current and future eco-innovation market and policy trends in Europe and beyond
- Funded by DG Environment of the European Commission
- Partners: Technopolis Group (leader), Wuppertal Institute, SERI, University of Turku C-Tech



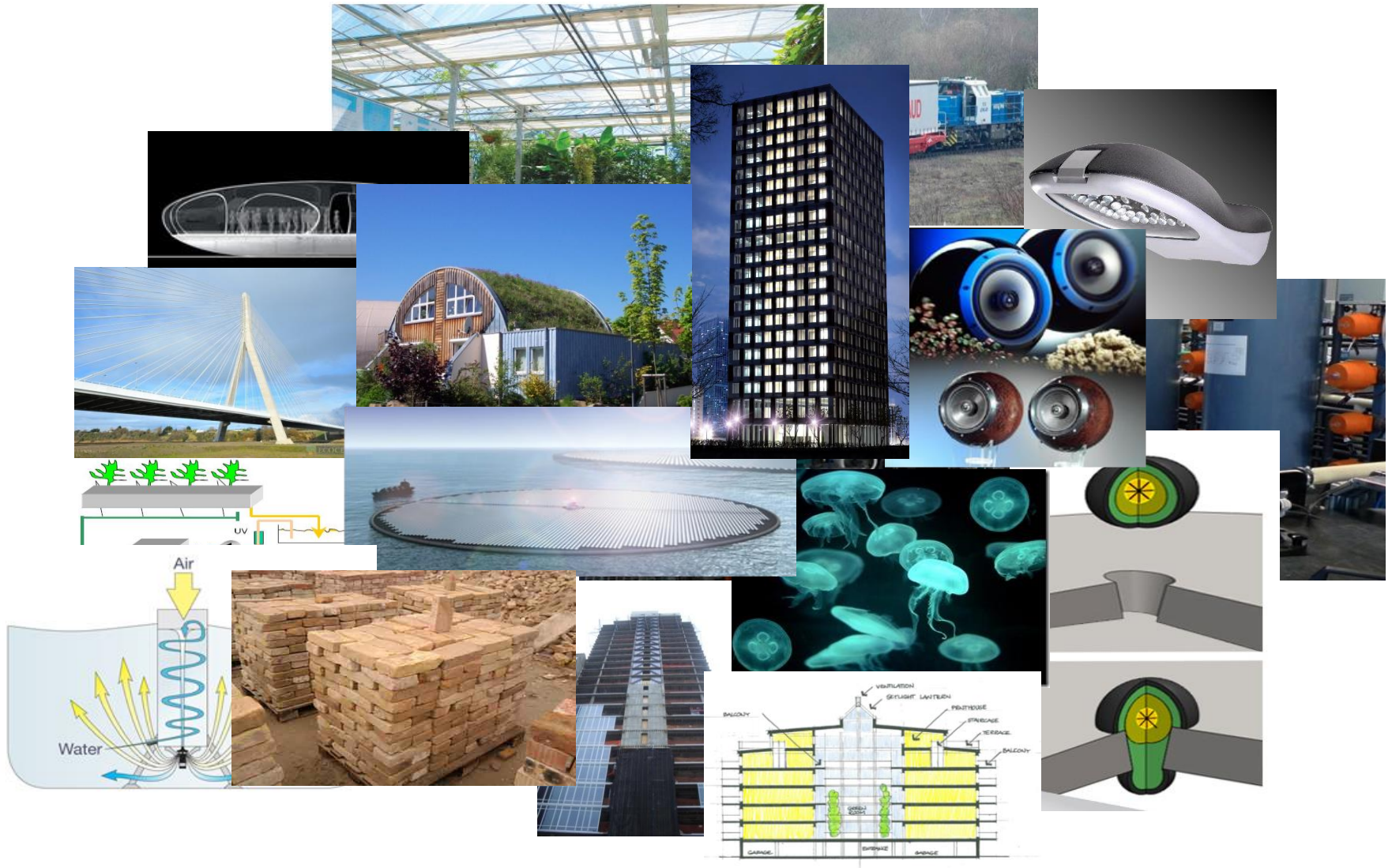


EIO resources

- Reports and briefs
- EU28 country profiles
- Database with on-line charts and maps
- Good practices
- Eco-innovation Scoreboard
- Eco-innovation glossary
- Surveys

Website: <http://www.eco-innovation.eu>

What is eco-innovation?



Eco-innovation is any innovation that reduces the use of natural resources (including materials, energy, water, biomass and land) and decreases the release of harmful substances across the whole life-cycle.



Economic dimension: innovation is a new or significantly modified solution implemented on the market or in the organisational practice

Eco-innovation is any **innovation** that reduces the use of natural resources and decreases the release of harmful substances across the whole life-cycle.

Eco-innovation is any innovation that **reduces the use of natural resources (including materials, energy, water, biomass and land) and decreases the release of harmful substances across the whole life-cycle.**

Environmental dimension:

Better (functional) use of natural resources and reduced emissions of harmful substances across the life-cycle.

Why do we need eco-innovations?

- Saving material and energy costs
- New products and services: new markets
- New business models

economy



- Sustainable management of natural resources
- Tackling climate change
- Improving biodiversity and ecosystem services

environment



- Enhanced quality of life
- New sustainable jobs

society



- Material security
- Resource independency

politics

DEFRA (UK): £23bn could be saved in 2009 in the UK by making simple changes to use resources more efficiently. Savings opportunities with a payback greater than one year estimated at £33bn. This gives a total opportunity of around £55bn (Oakdene Hollins 2011)

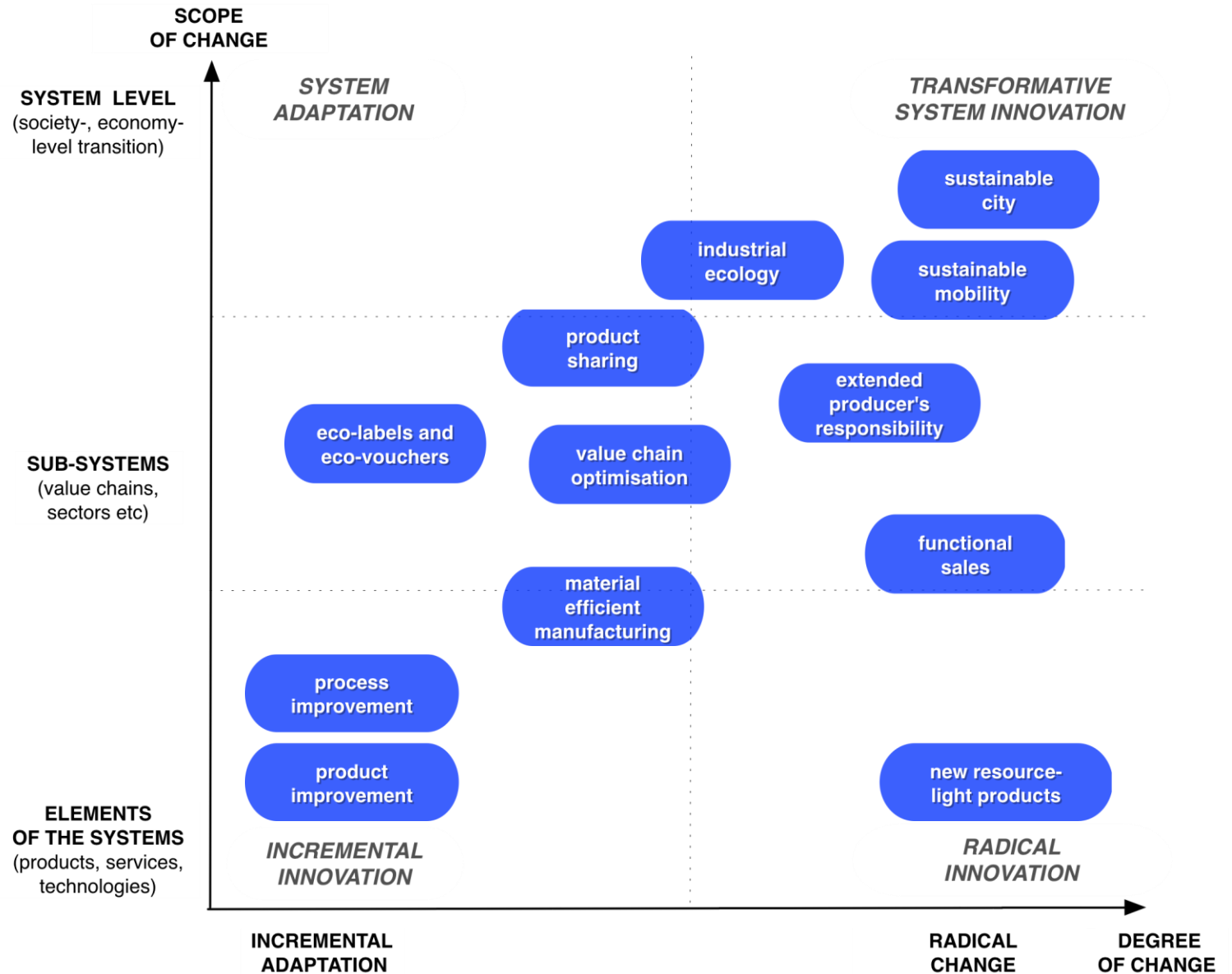


NISP – National Industrial Symbiosis Programme (UK): €982m saved and €1027m in additional sales created in the period April 2005-March 2011; €9 in direct receipts for every €1 invested in NISP (NISP Economic Valuation Report, Manchester Economics 2011)

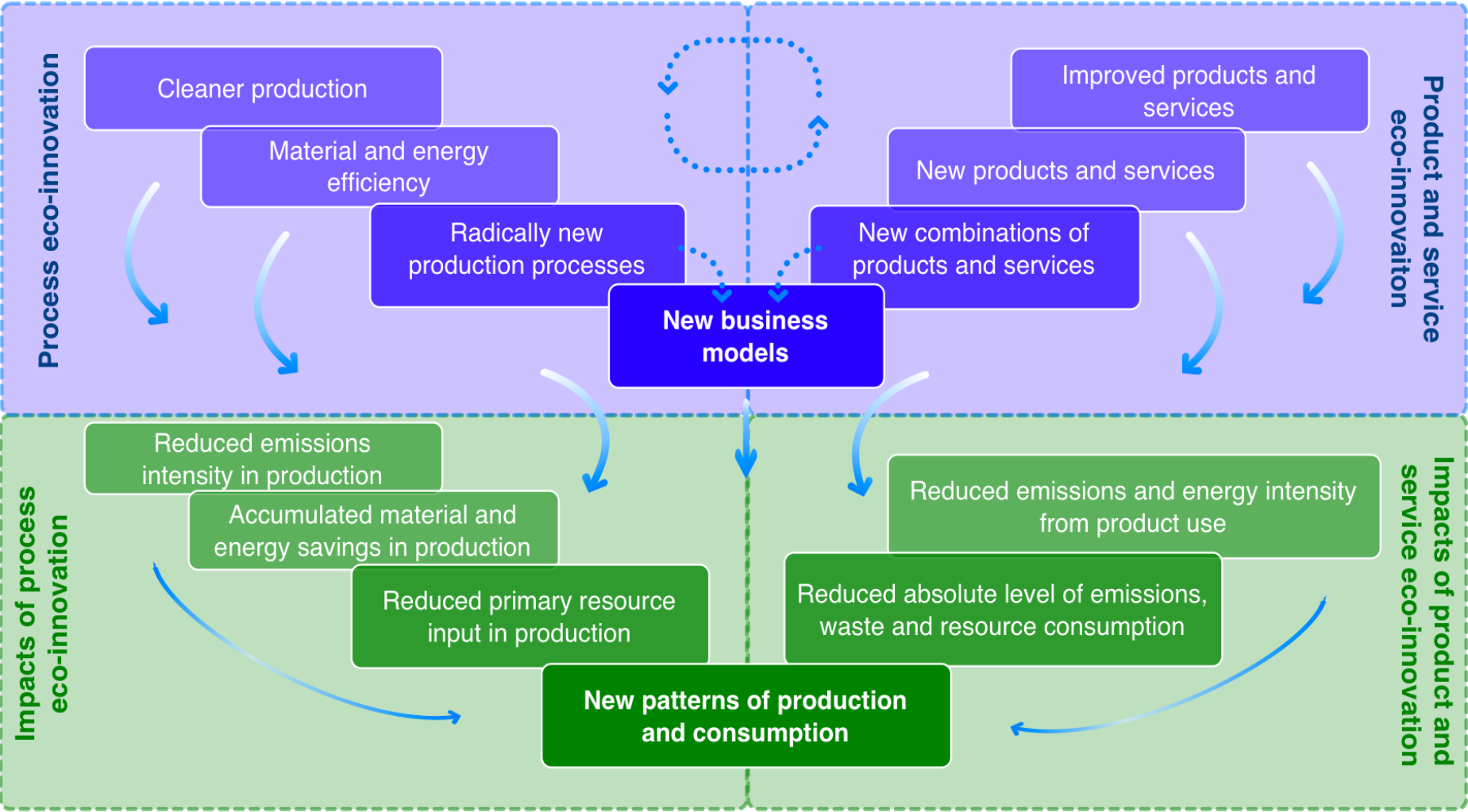


DEMEA (German Material Efficiency Agency) estimated about €200,000 of potential savings per company with an investment of under €10,000 in nearly half of the companies covered by the scheme (DEMEA 2010)





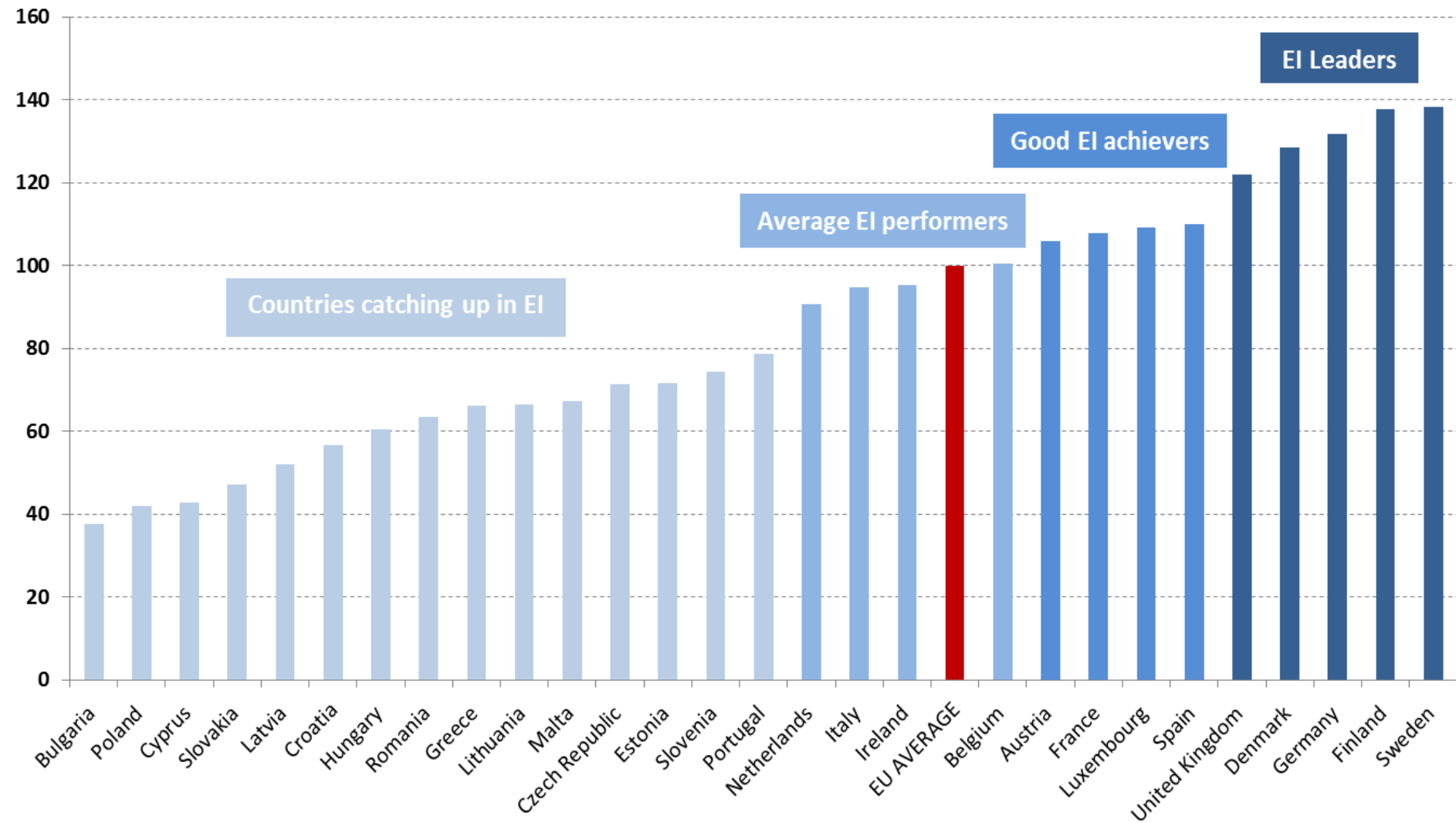
From incremental to systemic eco-innovation



What are the eco-innovation trends?

- ✓ Eco-innovation is on raise but still not in mainstream
 - *Many adhoc examples of incremental eco-innovations (product, processes, technologies) but limited diffusion*
 - *Very few examples of high-impact systemic/transformational eco-innovations*
 - *The current eco-innovation performance falls short to reach the objective of absolute decoupling of environmental impacts from economic growth*
- ✓ Measuring the eco-innovation trends is developing
 - *Methodologies are improving*
 - *But there are still challenges with data access and quality*

EU Eco-Innovation Scoreboard 2013



Eco-Innovation Scoreboard

1. Eco – innovation inputs

1.1. Governments environmental and energy R&D appropriations and outlays (% of GDP)

1.2. Total R&D personnel and researchers (% of total employment)

1.3. Total value of green early stage investments

2. Eco – innovation activities

2.1. Firms having implemented innovation activities aiming at a reduction of material input per unit output (% of total firms)

2.2. Firms having implemented innovation activities aiming at a reduction of energy input per unit output (% of total firms)

2.3. ISO 14001 registered organisations (per mln population)

3. Eco – innovation outputs

3.1. Eco-innovation related patents (per mln population)

3.2. Eco-innovation related academic publications (per mln population)

3.3. Eco-innovation related media coverage (per numbers of electronic media)

4. Resource efficiency outcomes

4.1. Material productivity (GDP/Domestic Material Consumption)

4.2. Water productivity (GDP/Water Footprint)

4.3. Energy productivity (GDP/gross inland energy consumption)

4.4. GHG emissions intensity (CO₂e/GDP)*

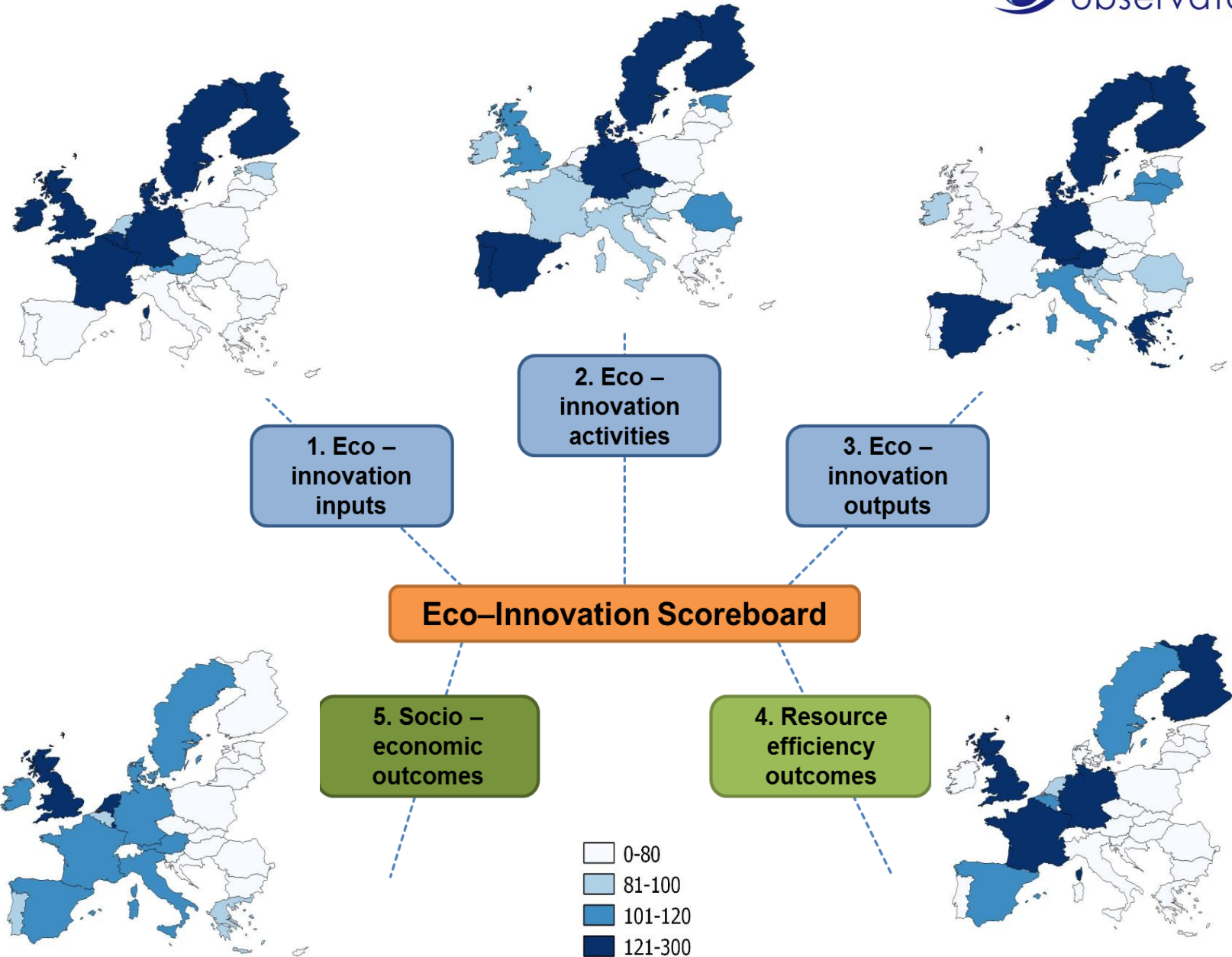
5. Socio – economic outcomes

5.1. Exports of products from eco-industries (% of total exports)

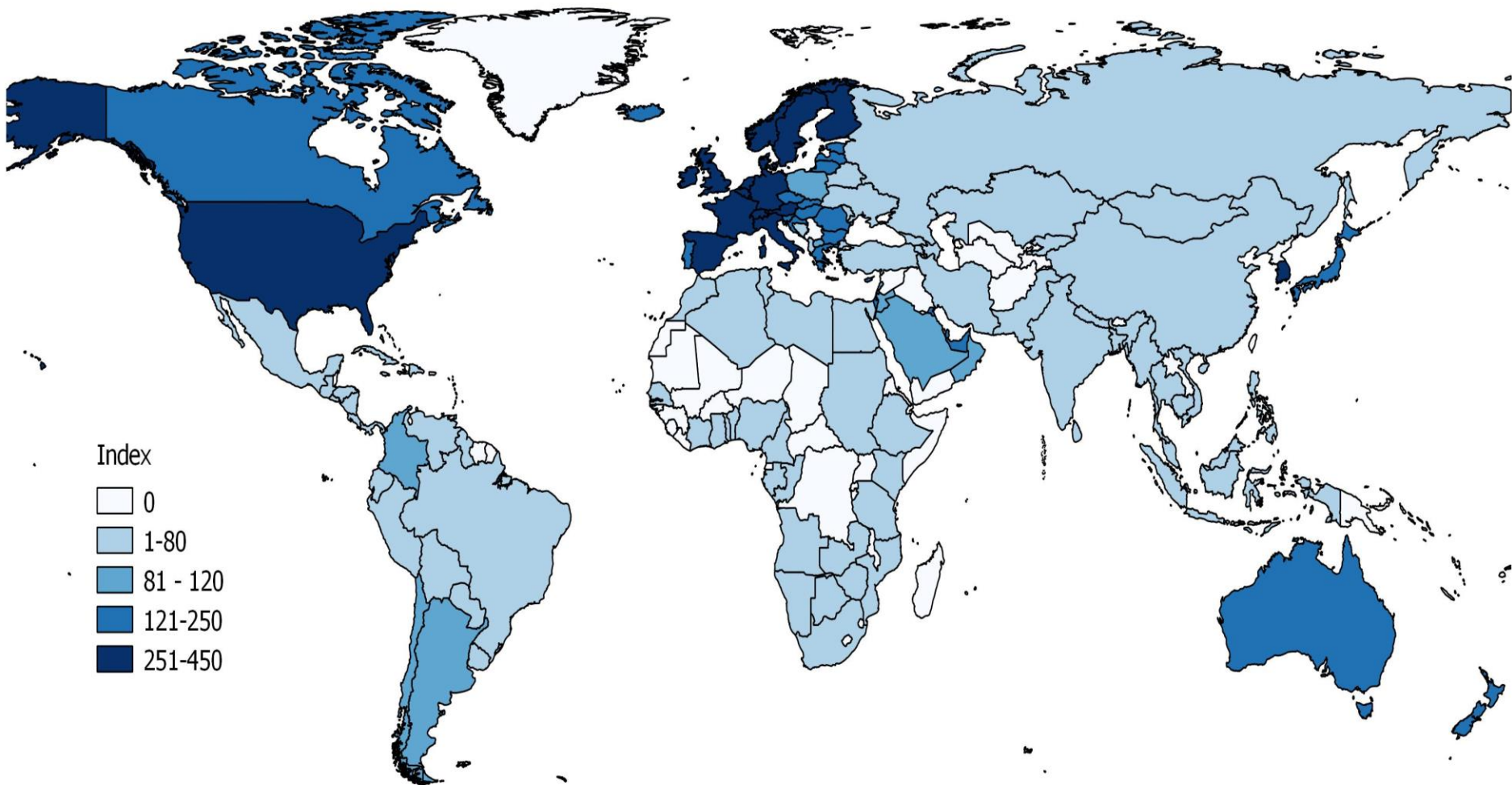
5.2. Employment in eco-industries and circular economy (% of total employment across all companies)

5.3. Revenue in eco-industries and circular economy (% of total revenue across all companies)

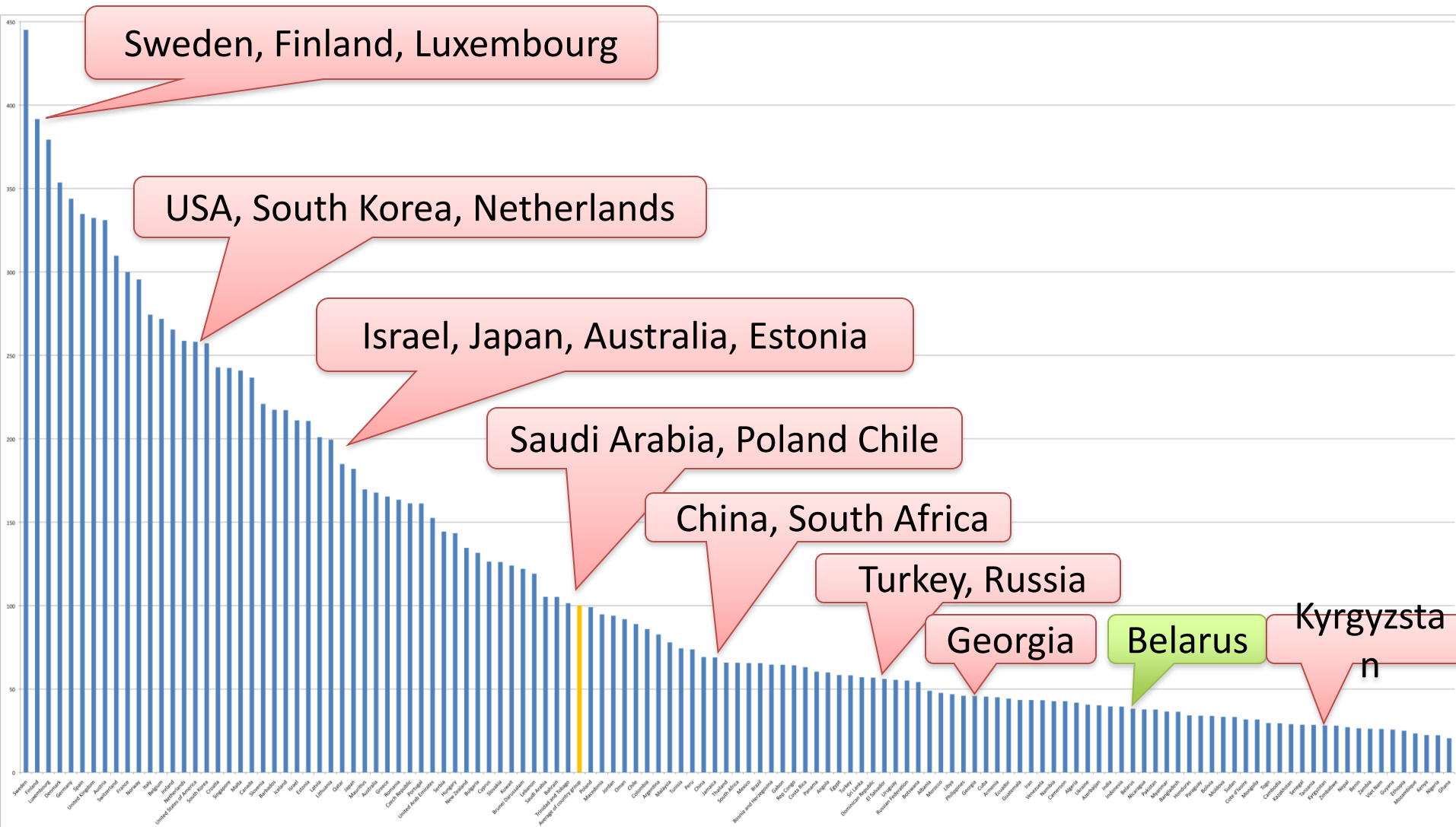
EU Eco-Innovation Scoreboard 2013



Global Eco-Innovation Scoreboard 2013

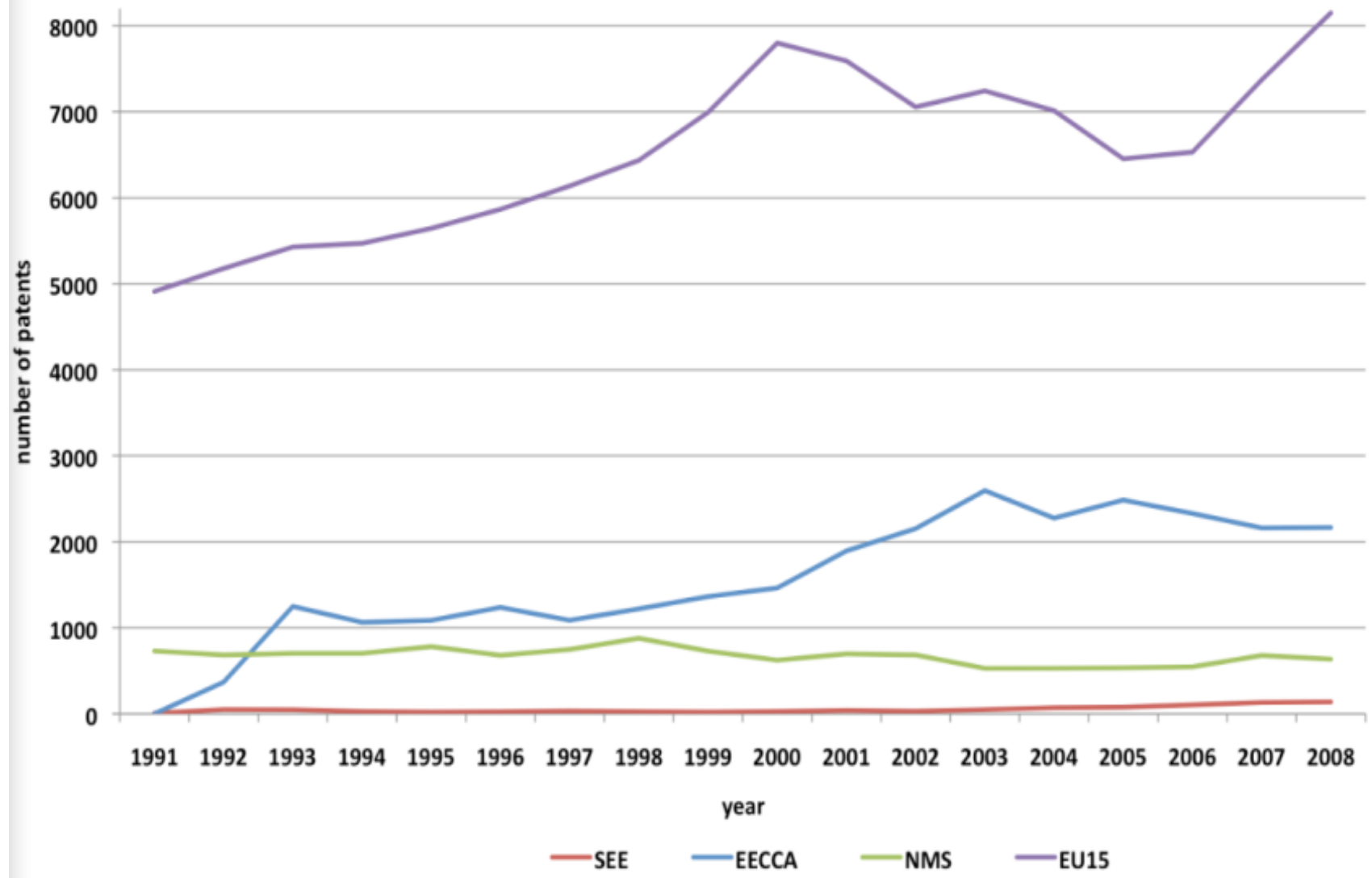


Global Eco-Innovation Scoreboard 2013



Total number of environmental patents filed

Total number of environmental patents filed in SEE, EECCA, NMS and EU15

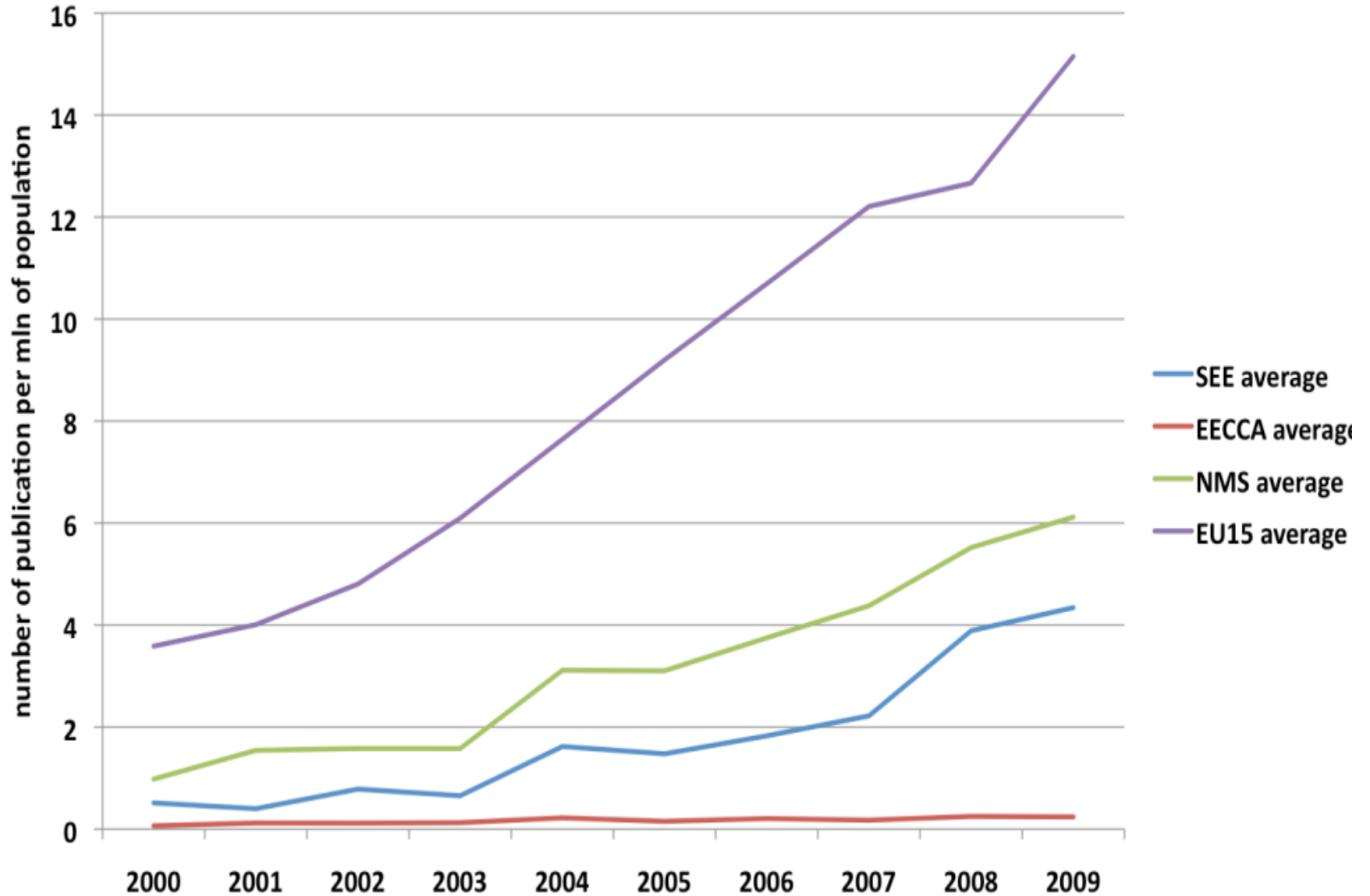


Environmental patents filed in 2012

	N of environmental patents	N patents per mln population
Germany	2114	25,8
USA	1643	5,3
South Korea	1005	20,2
France	655	10,0
China	359	0,3
Italy	241	4,0
United Kingdom	224	3,6
Japan	211	1,7
Denmark	172	30,9
Sweden	131	13,8
Spain	129	2,8
Austria	90	10,6
Finland	77	14,3
Switzerland	75	9,5
Canada	63	1,8
Netherlands	57	3,4
India	44	0,0
Belgium	35	3,1
Norway	31	6,2
Hungary	26	2,6
Russian Federation	19	0,1
Israel	18	2,3
Poland	17	0,4

	N of environmental patents	N patents per mln population
Czech Republic	13	1,2
Brazil	13	0,1
Australia	11	0,5
Greece	10	0,9
Luxembourg	8	15,9
Portugal	8	0,8
Ireland	8	1,7
Slovenia	5	2,4
Slovakia	4	0,7
Romania	3	0,2
Croatia	3	0,7
New Zealand	2	0,4
Bulgaria	2	0,3
Estonia	1	1,0
Lithuania	1	0,3
Ukraine	1	0,0
Armenia	0	0,0
Azerbaijan	0	0,0
Belarus	0	0,0
Georgia	0	0,0
Kazakhstan	0	0,0
Kyrgyzstan	0	0,0
Latvia	0	0,0
Moldova	0	0,0

Environmental publications in scientific journals



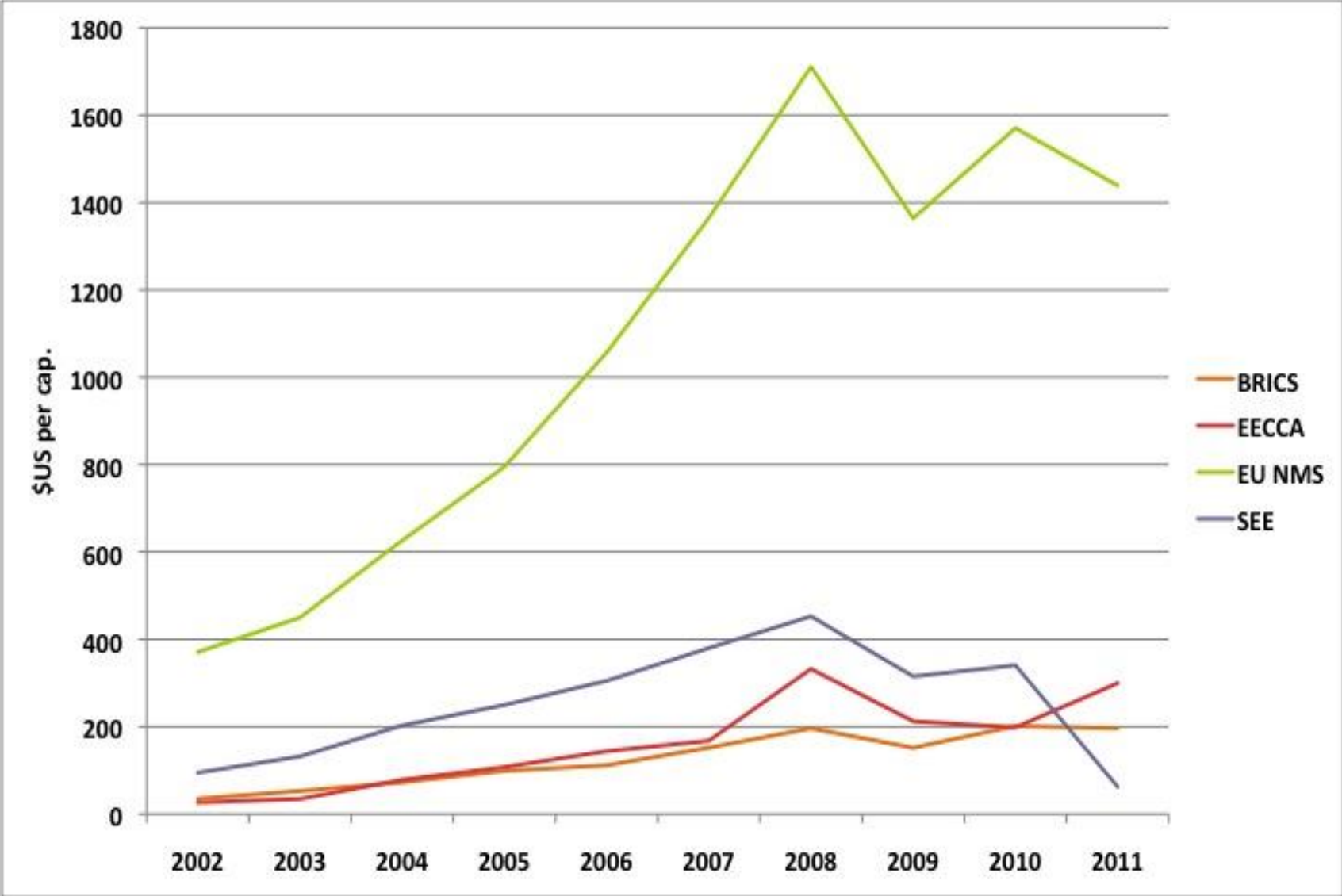
ISO 14001 certification

EU 28	Number of ISO 14001 certificates, 2012	Data per mln population, 2012
Austria	1084	0,13
Belgium	1026	0,09
Bulgaria	1395	0,19
Croatia	760	0,18
Cyprus	32	0,03
Czech Republic	4215	0,40
Denmark	1756	0,31
Estonia	394	0,29
Finland	1310	0,24
France	7975	0,12
Germany	7034	0,09
Greece	657	0,06
Hungary	1718	0,17
Ireland	417	0,09
Italy	19705	0,32
Latvia	237	0,12
Lithuania	680	0,23
Luxembourg	51	0,10
Malta	23	0,05
Netherlands	2085	0,12
Poland	2014	0,05
Portugal	1184	0,11
Romania	8633	0,40
Slovakia	1426	0,26
Slovenia	420	0,20
Spain	19470	0,42
Sweden	3885	0,41
United Kingdom	15884	0,25

EECCA	Number of ISO 14001 certificates, 2012	Data per mln population, 2012
Armenia	4	0,00
Azerbaijan	56	0,01
Belarus	29	0,00
Georgia	4	0,00
Kazakhstan	122	0,01
Kyrgyzstan	1	0,00
Moldova	7	0,00
Ukraine	166	0,00

BRICS	Number of ISO 14001 certificates, 2012	Data per mln population, 2012
Brazil	3300	0,02
China	91590	0,07
India	4263	0,00
Russian Federation	1090	0,01
South Africa	938	0,02

Environmental goods export per capita trends, 2002-2011, US\$/cap



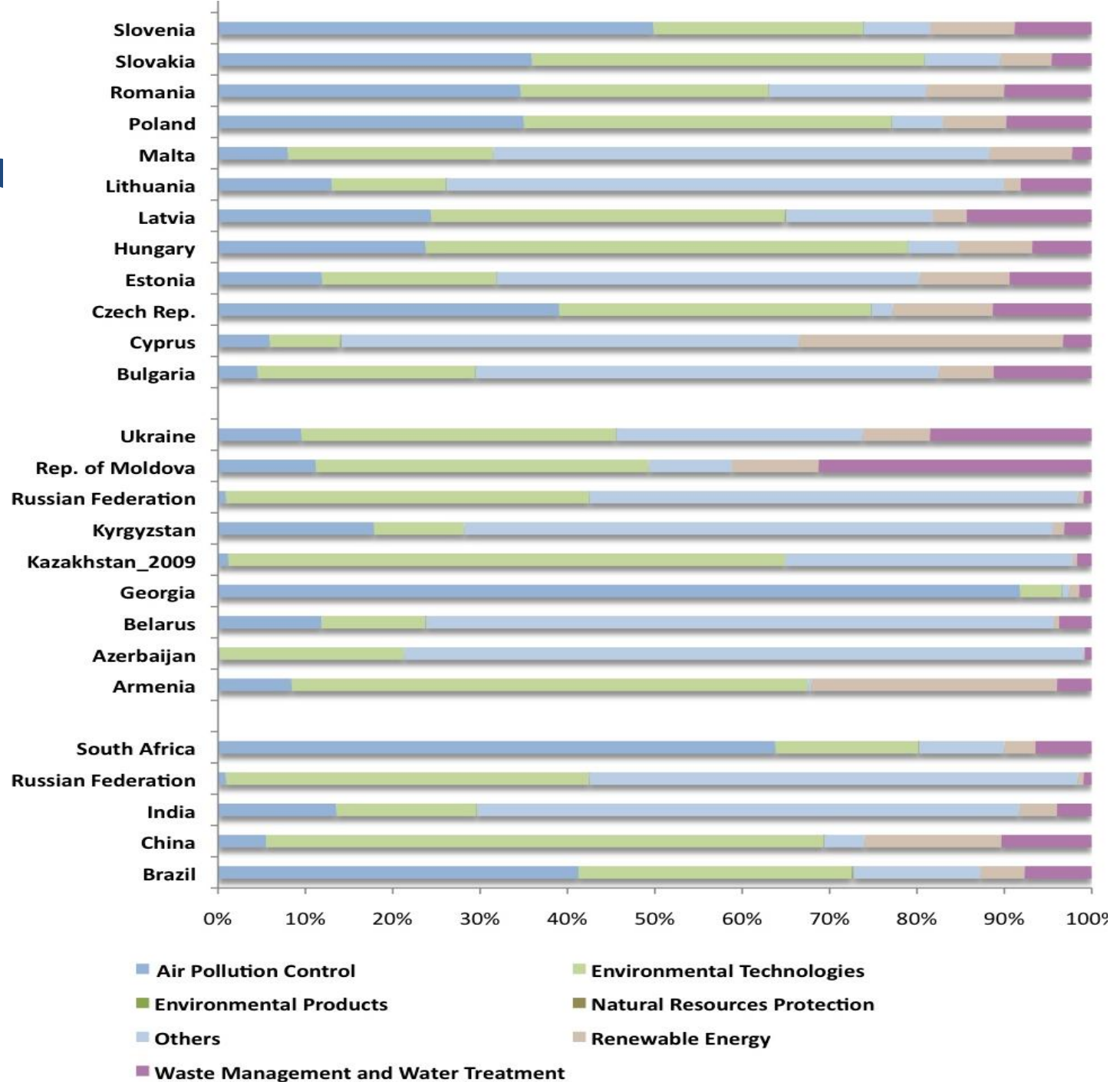
Environmental goods Export, Mln USD

	2010	
	Final goods	Intermediate goods
Brazil	5,949.1	10,726.6
China	258,063.5	117,380.8
India	6,492.5	47,373.3
Russia	2,745.5	121,345.1
South Africa	4,681.3	3,466.4
BRICS Total	277,931.8	300,292.2

	2010	
	Final goods	Intermediate goods
Bulgaria	935.7	3,193.7
Cyprus	45.3	352.8
Czech Rep.	14,639	11,376.5
Estonia	854.9	2,198.7
Hungary	13,536.4	7,776.1
Latvia	521.7	499.1
Lithuania	1,127.2	5,315.5
Malta	83.7	242.6
Poland	15,838.3	11,381.3
Romania	3,061.1	5,773.6
Slovakia	11,653.5	7,263.9
Slovenia	1,401.8	2,446.3
EU NMS Total	63,698.7	57,820.3

	2010	
	Final goods	Intermediate goods
Armenia	8.6	26.6
Azerbaijan	7.9	1,641.5
Belarus	1,865.8	7,525.5
Georgia	31.4	9.3
Kazakhstan	<u>n.a</u>	<u>n.a</u>
Kyrgyzstan	18.6	69.9
Rep. of Moldova	34.7	24.9
Ukraine	1,971.5	5,597.1
EECCA Total	3,938.5	14,894.6

Specialisation in Environment Goods Export, 2010



Eco-innovation needs and challenges in emerging countries

- ✓ Population growth and increasing resource scarcity including land, water, food, as well as nature degradation
- ✓ Climate change, through its effects on water, is threatening agriculture, and disaster prone areas
- ✓ Increasing industrialisation and urbanisation which puts increasing pressure on environment
- ✓ Growing middle class following western consumption style
- ✓ Increasing awareness of government in greening their economies, adoption of targets, and strengthening environmental regulation
- ✓ Emerging demand for green products and services

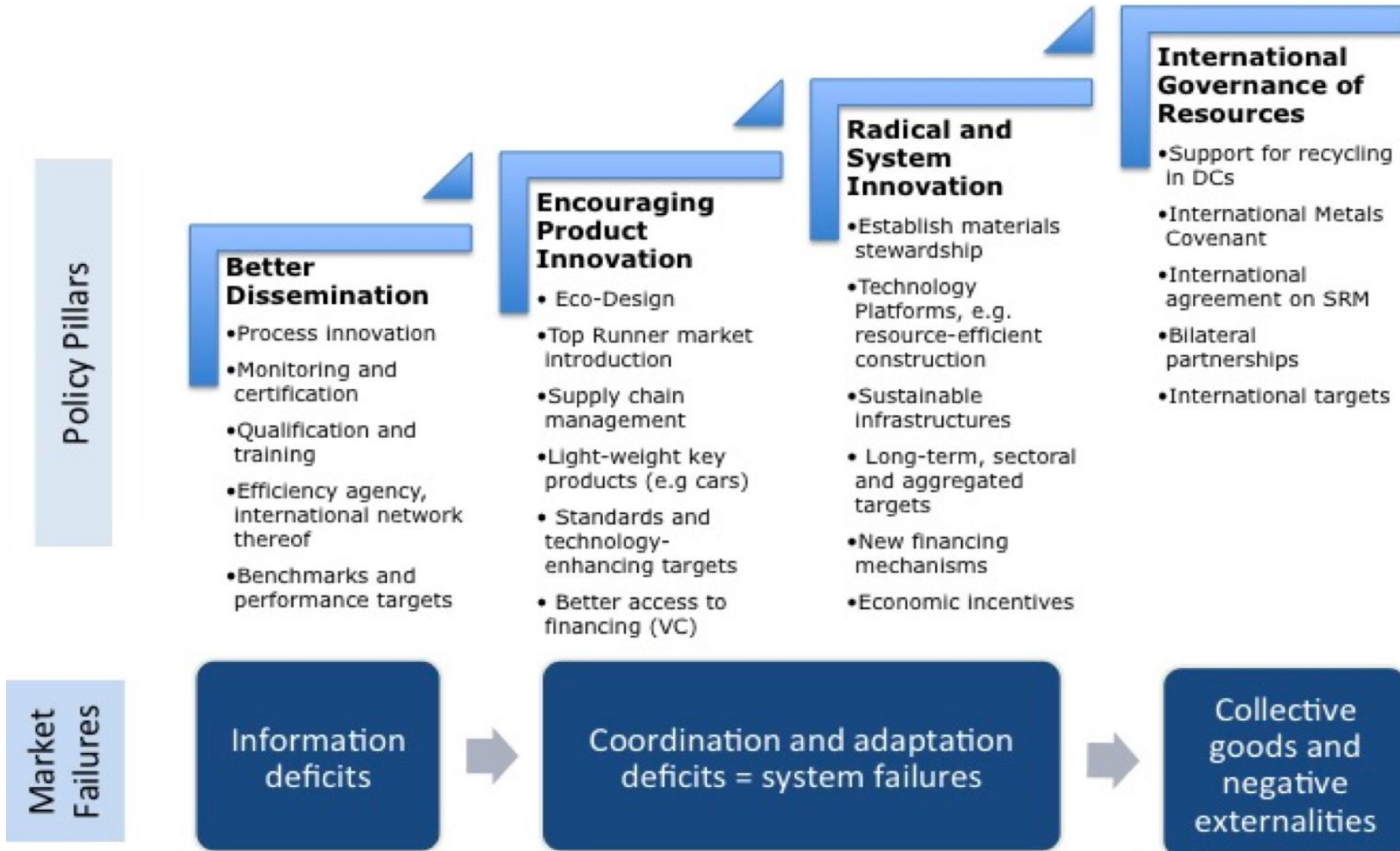
Barriers to eco-innovation in emerging countries

Economic barriers	Lack of investments and access to financial tools
	Lack of governmental economic incentives
	Lack or limited access to IPR
	Lack of consumer demand for eco-innovative products & services
	Failure of markets to capture economic and environmental benefits
	Trade barriers
Institutional barriers	Lack of adequate institutional policies
	Lack of effective public-private partnership for eco-innovative markets
	Inefficient administrations and regulations (e.g. custom), corruption
Technological & knowledge-base barriers	Lack of adequate infrastructure
	Lack of access to skilled human resources
	Lack of technologies tailored to the region's needs
Other barriers	Stagnant business mentality of local actors
	Perception of high risks linked to eco-innovation business
	Cultural barriers facing newcomers in developing countries markets

Drivers of eco-innovation in emerging markets

Economic drivers	Reduction of production costs & dependency on traditional energy sources
	Enhance access to international market segments
	Establishing key partnerships with international companies
	Creating a demand for so-called “green jobs”
Technical drivers	Technological leapfrogging
	Increase compliance with environmental regulations
	Creation of and skilled labour force
Organisational drivers	Improve brand reputation
	Increase competitive market advantage over competitors
Other drivers	Improve living conditions of local communities

Eco-innovation Policy Pillars



Thank you!