



Energy Vulnerabilities in Europe

**World Energy Council
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Global Europe 2050

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*** Personally speaking**



European
Commission

World and European Energy and Environment Transition Outlook

WETO-T

Global Europe 2050

EUROPEAN COMMISSION / European Research Area / Social sciences & humanities

EUROPEAN POLICY BRIEF



**The changing oil value chain:
Implications for security of supply**

POLINARES is an EU-funded research project addressing global challenges in the competition for natural resources and proposing new approaches to collaborative governance.

Ongoing Project

INTRODUCTION

A New Market Structure

The overall objectives of the project are to identify challenges relating to competition for access to oil resources, and to propose new approaches and solutions for the various policy actors, including the

International oil companies (IOCs) have long played a key role in securing oil supplies for Europe, first through integration along the supply chain and later through their active participation in international oil markets and ownership of refining capacity in Europe.

This favourable situation is now changing. The many of their oil refineries and instead are concentrating investment on oil exploration and production and on the supply chain. Where they do decide to remain active, IOCs are progressively concentrating their assets in a few locations. As the IOCs move out of the downstream of the oil value chain, national oil companies (NOCs) are progressively concentrating their assets in the upstream. These NOCs come from oil exporting states and economies such as China.

These changes will have consequences for managing security of oil supply in Europe as well as for balance of payments, industrial capacity and employment.

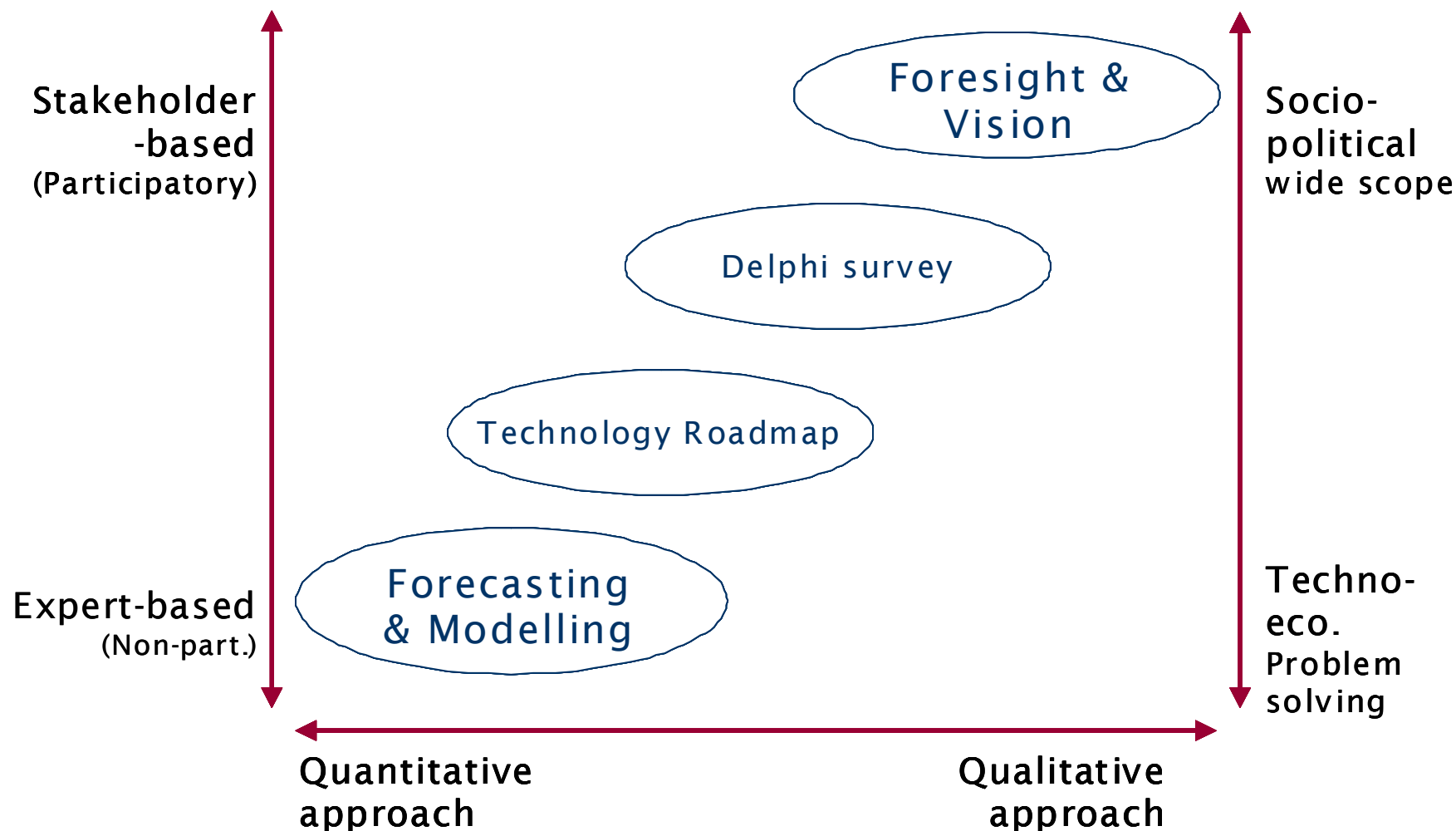
STUDIES AND REPORTS



http://ec.europa.eu/research/social-sciences/forward-looking_en.html

Foresight and Forecast

Methods: Foresight and Forecast



Source: D. Rossetti



EU Forward Looking Activities (FLA)

- European Council: Gonzalez Report « Europe 2030 »
- EP: Scientific Technology Options Assessment (STOA)
- Council and Member States: Joint Programming (JPI)
- European Commission:
 - FAST and *Cellule de Prospective* / BEPA
 - Multiannual Financial Perspectives and long-term planning (SF, FP)
 - Europe 2020
 - EU "Roadmaps" (low carbon economy, transport, energy – 2050)
 - DG JRC (IPTS)
 - DG RTD – FP7

Source: D. Rossetti

Modesty is a must in FLA

- **Financial and economic crises**
- **Technological developments**
- **Social habits**
- **Political movements**

Controversies on FLA

- **Baseline / Reference scenario?**
- **Objectivity and bias among experts?**
- **Clarity and opacity of models?**
- **Conventional thinking and beyond it?**
- **Over and sub simplification of complexity?**



***Pour sortir de la crise,
il faut "voir plus loin"***

Sylvie Goulard et Mario Monti





European
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The Power of Science

Economic research and European decision-making:
The case of energy and environment policies

Domenico Rossetti di Valdalbero

P.I.E. PETER LANG



EU FP7 research activities – 2013

FP7-SSH-2013

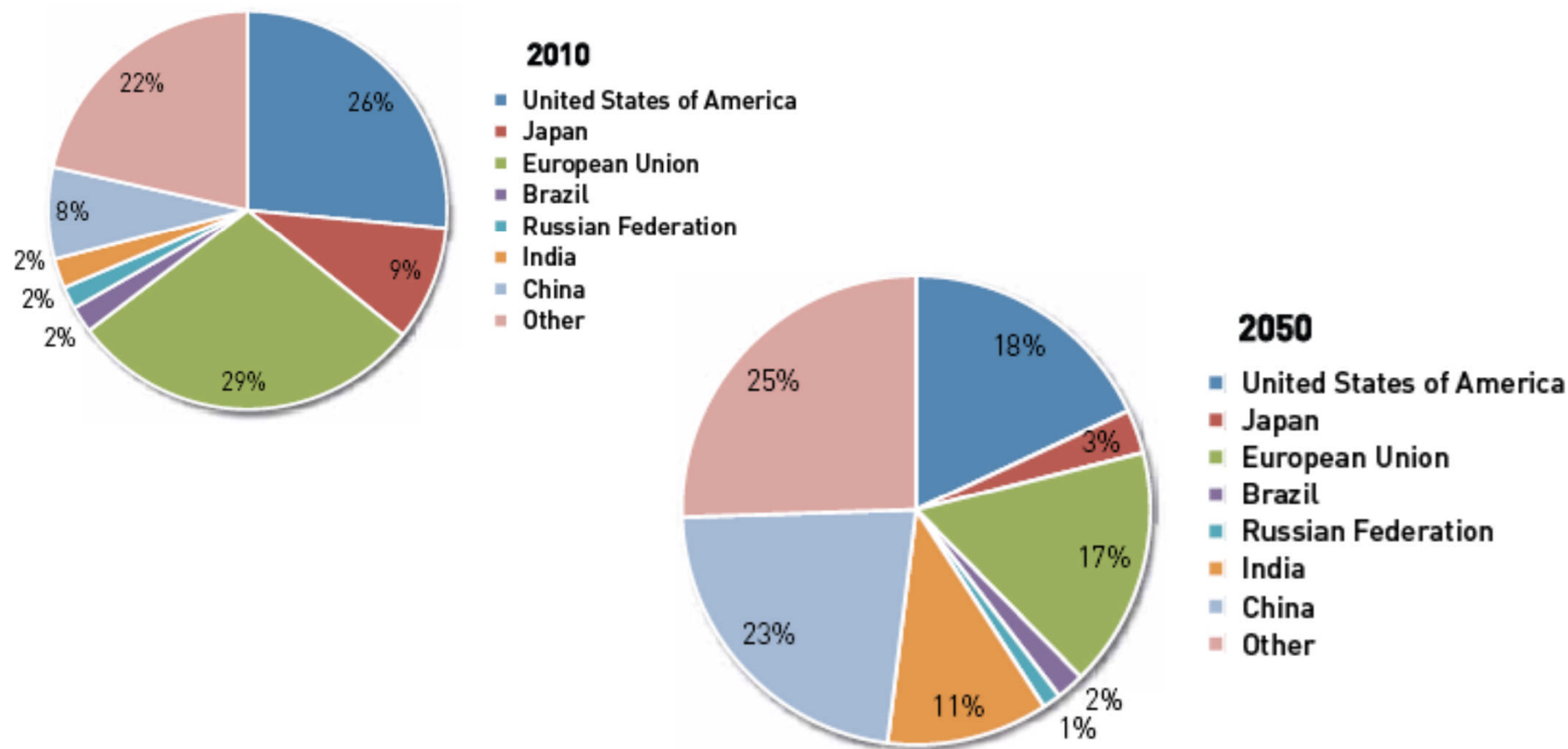
- **Obstacles and prospects for sustainable lifestyles and green economy in Europe**
- **Post carbon cities in Europe: A long term outlook**

FP7-ENV-2013

- **Transition to sustainable, low carbon societies**
- **Network for forward looking activities and assessment of research and innovation prospects**



World and EU GDP (2010 and 2050)



Source: EC, DG RTD, Global Europe 2050 (L. Fontagné)

Megacities and concentration of needs

	1950 (millions)	2010 (millions)
Mexico	3	23
Seoul	1	23
Mumbai (Bombay)	3	20
Jakarta	1,5	16
Cairo	2,5	15
Teheran	1	12
Istanbul	1	11

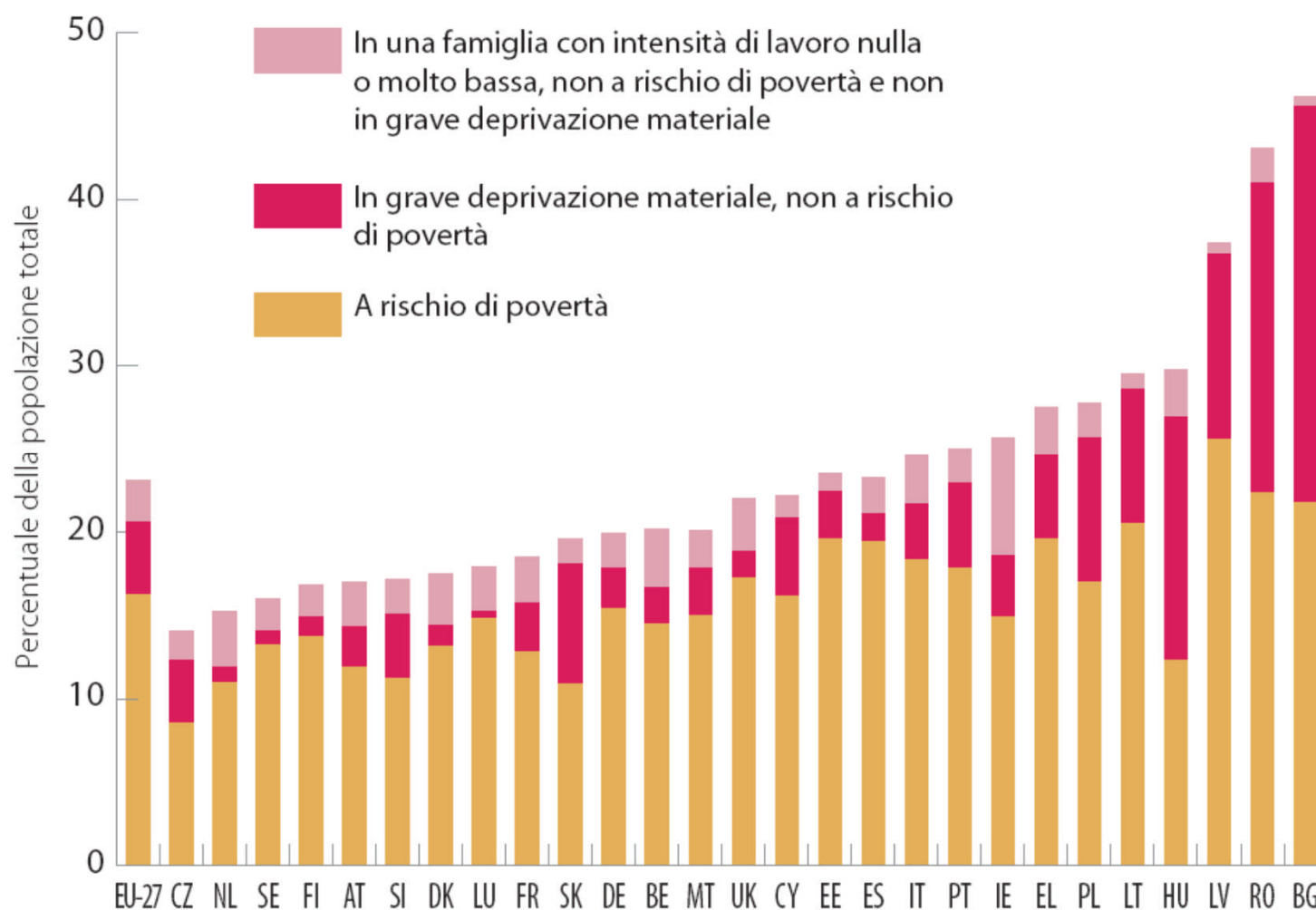
Share of urban population living in slums

Sub Saharian Africa	62
Southern Asia	43
Eastern Asia	36
South Eastern Asia	27
Latin America	27

Source: UN HABITAT



Poverty in the EU (~ 20% at risk)



Source: EU-SILC



CO2 emissions – Old and new actors

	2000	2050	
49%	USA & Canada	23%	27%
	Enlarged EU	14%	
	Russia & CIS	8%	
	Japan	4%	
51%			73%
	S-E Asia - China	20%	
	South Asia - India	7%	
	Africa	7%	
	Latin America	7%	
	Others	10%	



Global Europe 2050





The Expert Group

Main leaders

European Commission: DG RTD & BEPA - Rapporteur: Andrea RICCI

State of the art: Anette BRAUN - Scenario building : A. RICCI & Carlo SESSA

Modelling: Lionel FONTAGNE - Research needs: Luc SOETE

Effie AMANATIDOU

Daniele ARCHIBUGI

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Maciej BUKOWSKI

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Ged DAVIS

Jaap de ZWAAN

Nicole GNESOTTO

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Heli KOSKI

Ana MORATO MURILLO

Geoff MULGAN

Tomas RIES

Ingo ROLLWAGEN

Karlheinz STEINMULLER

Leopold SUMMERER

Philine WARNKE



Three Global Europe 2050 Scenarios

- ***Nobody cares***
- ***EU under threat***
- ***EU Renaissance***





Global Europe 2050

Nobody cares



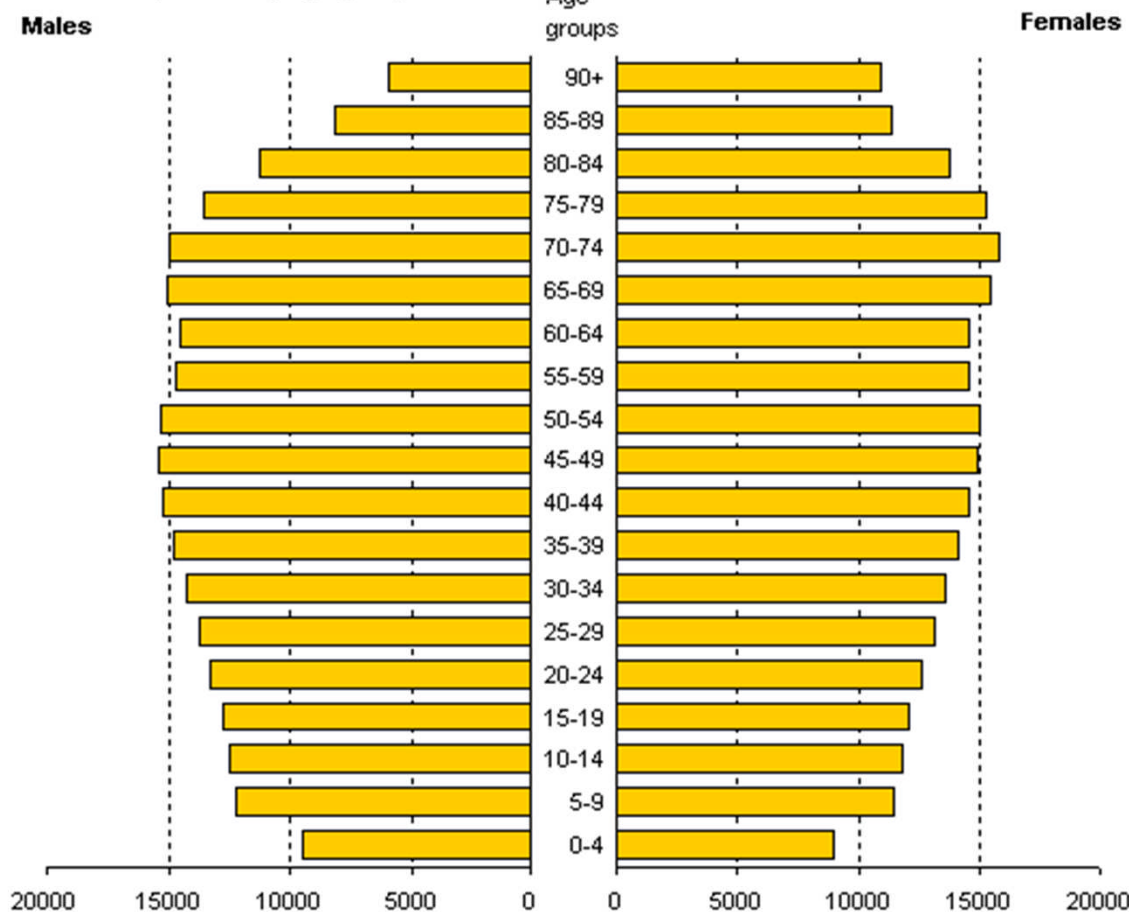


Global Europe 2050 - *Nobody cares*

- **Standstill in European integration**
- **Europe “muddles through”**
- **Low growth, USA/EU divergence**
- **Ageing => economic unsustainability**
- **Fractured European market**
- **Increased dependence on foreign supply of energy**
- **Limited public support to addressing climate change**
- **Baseline (projections)**

EU population in 2060 (000 people)

EU27: 2060 Population by age groups and sex



The number of people over 65 will double in 50 years (from 85 million in 2008 to 151 million in 2060)

The "oldest old" (85 and over) will almost triple

The share of health expenditures in the EU is expected to increase from 8% of GDP today to 13% in 2060

EU oil consumption and production



Source: Grande Reportagem



Largest countries by 2050 (100 million or over)

- India (1692)
 - China (1296)
 - USA (403)
 - Nigeria (390)
 - Indonesia (293)
 - Pakistan (275)
 - Brazil (223)
 - Bangladesh (194)
 - Philippines (155)
 - Congo (149)
 - Ethiopia (145)
 - Mexico (144)
 - Tanzania (138)
 - Russia (126)
 - Egypt (123)
 - Japan (109)
- Not a single European country in this list***
- EU27 as such (516) is third**



***Il n'y a plus que des petits pays en Europe,
mais certains ne le savent pas***

Paul-Henri Spaak





Global Europe 2050

EU under threat





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Gonzalez Report “Europe 2030”



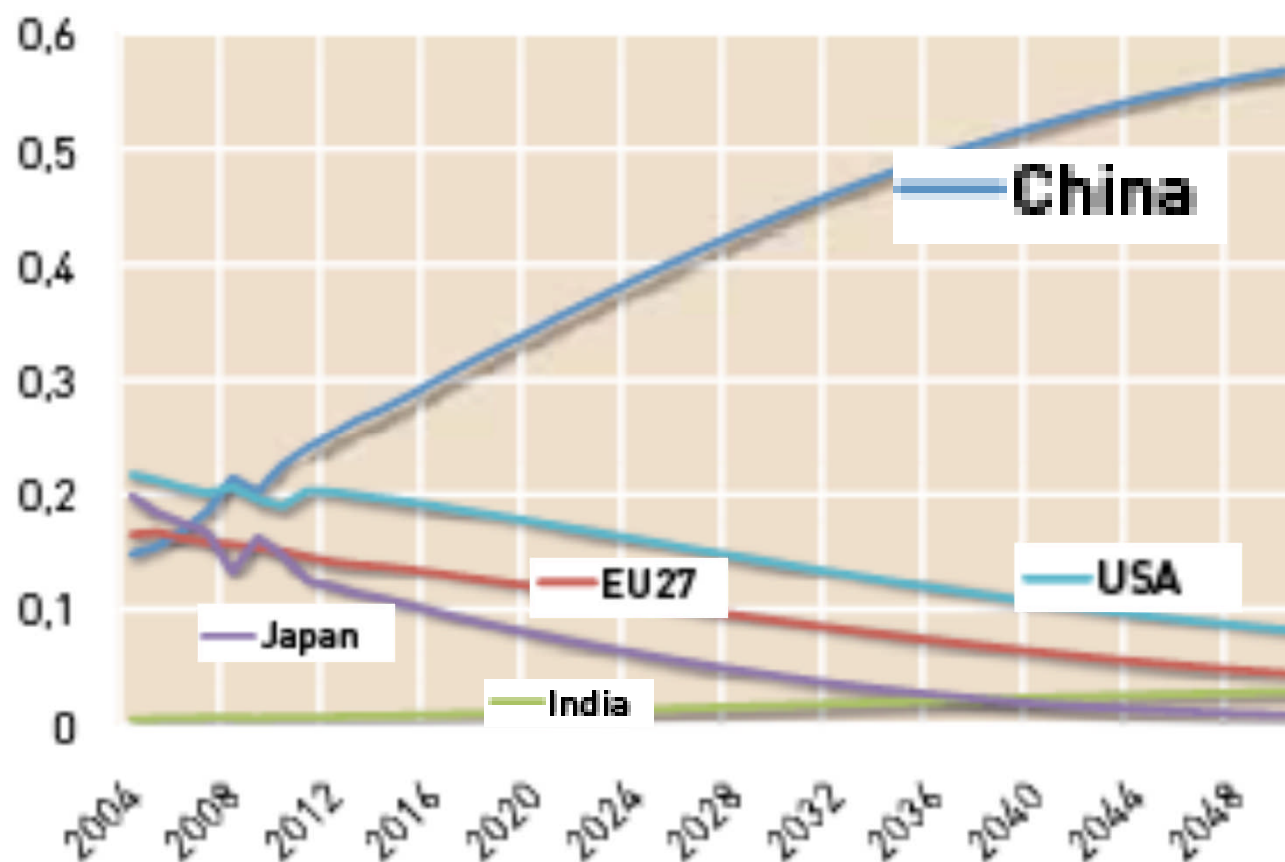
Europe is at a crossroads: either we keep and strengthen the role as one of the main global actors, or we become an “increasingly irrelevant outgrowth on the Asian continent”

Source: <http://www.flagslist.com/maps/Asia/asia-map.gif>

Global Europe 2050 - *EU under threat*

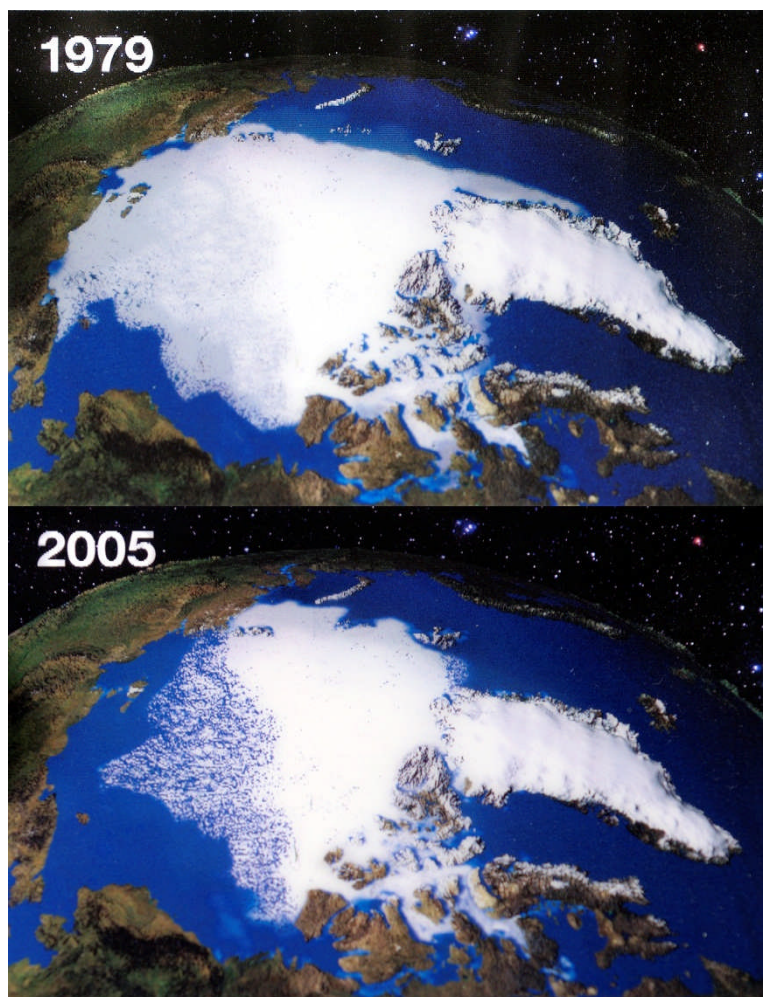
- **Fragmented European Integration**
- **Global economic decline (collapse?)**
- **Protectionism, increase in transaction costs (terrorism, congestion of infrastructures)**
- **Geopolitical shock(s) e.g. civil wars (China India), Nuclear war (Middle East, Asia), extreme right fundamentalist governments (USA)**
- **EU “disintegrates” (e.g. withdrawal of Germany, two or more speeds)**
- **Climate change not addressed**
- **Major energy supply disruptions, failures of grid system**
- **Oil and Food shocks**

Share of the world production of electronic products



Source: EC, DG RTD, Global Europe 2050 (L. Fontagné)

Climate change mitigation and adaptation



Source: WWF and NASA



Source: Hertzberger

1990: 20 Gt CO₂
2010: 29
2030: 38
2050: 44

Source: EC, DG RTD, WETO (P. Criqui)



Global Europe 2050

EU Renaissance



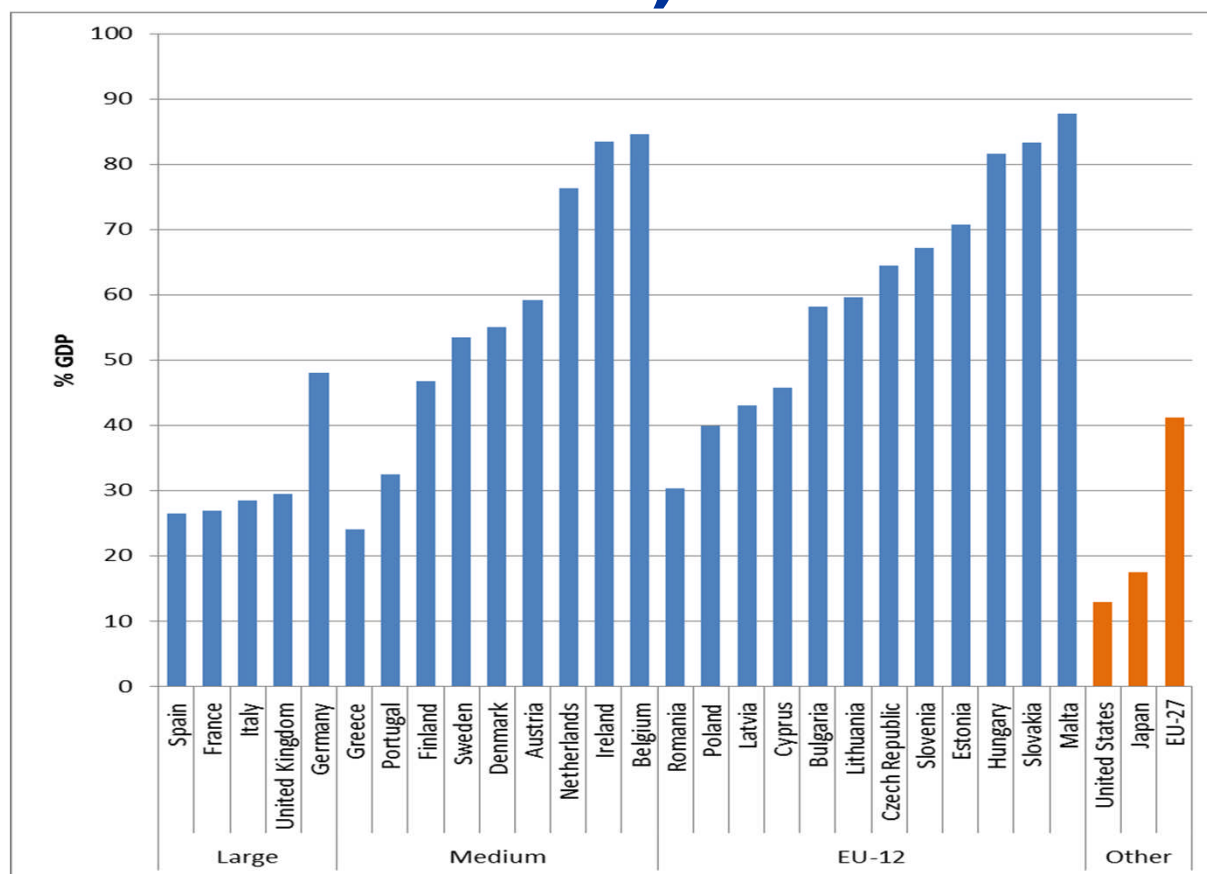


Global Europe 2050 - *EU Renaissance*

- **Further European integration**
- **Global security (human rights and rule of law, sust. devt.)**
- **Strong European support for a socio-ecological transition**
- **Democratization of power (democratic networks and participation, non-state actors, media)**
- **Enlarged and integrated EU**
- **One foreign policy, one voice, one army, one taxation system**
- **Continental integration of (smart) grids and pipeline systems including e.g. North Europe wind farms & Med. solar**
- **Systemic innovation (technical, social, organisational)**

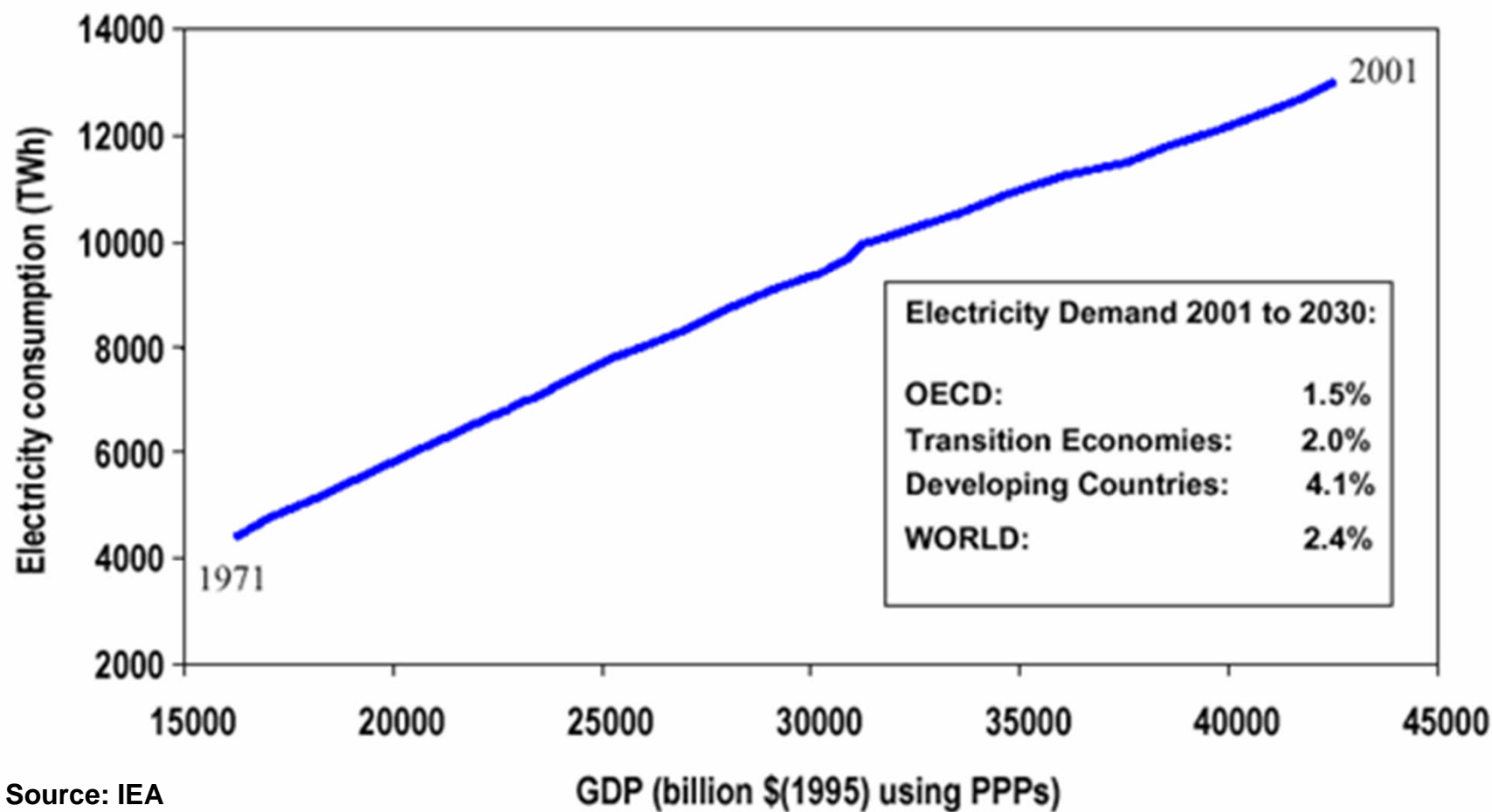


Exports of goods and services (incl. intra EU-trade) as % of GDP in 2008



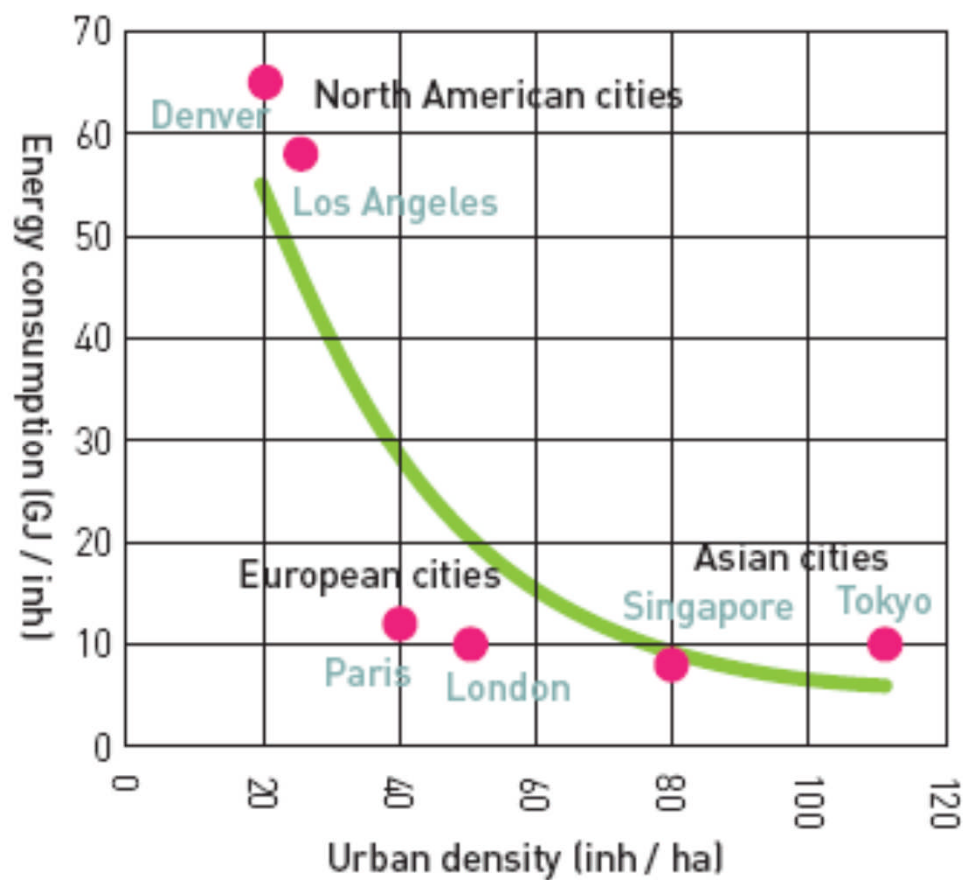
Source: EC – AMECO database

Decoupling energy and wealth

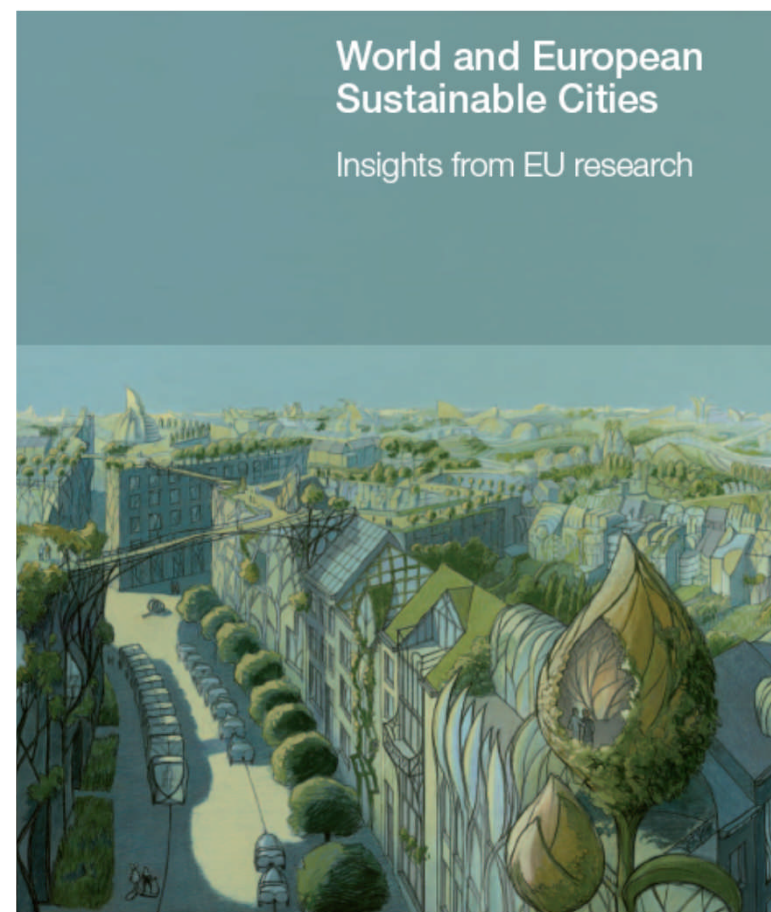


Source: IEA

Building sustainable cities



Source: Newman and Kenworthy



Source: EC, DG RTD (cover from L. Schuiten)

Acting on lifestyles



Source: Google images



Valuing the time



Source: Google image





Innovating

- **Technological innovation**
But the value of manufactured products is increasingly based on intangibles
- **Open innovation**
Firms do not develop innovation in a closed system
- **Global innovation**
Not only the production but also the innovation networks are now globalized
- **Social innovation and demand-side innovation**
Social scope, customer's-employee interface, marketing and organisational innovation

Source: D. Rossetti



Conclusions – Some dangers

- **Euroscepticism & a MS alone can play a significant role**
- **Harmonization (vs. creativity, imagination)**
- **NIMBY & BANANA-** Build absolutely nothing, anywhere near anybody
- **Back-ward and inward-looking**
- **Considering the Socio-ecological transition as a problem rather than an opportunity** (cf. globalisation, ageing, territorial dynamics, new energy, ICT, etc)

