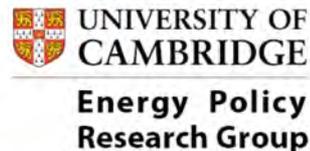


In search of good energy (transition) policy

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CEEPR & EPRG European Energy Policy Conference
Paris, 7-8 July 2016

Outline

- ➔ **COP 21: the Paris Agreement as new “framework” for good energy policies**
- ➔ Good energy policies: Dealing with an extended (and highly complex) core of constraints
- ➔ Good energy policies: The Myth of Sisyphus?
- ➔ Appendix



Paris Agreement

The Parties to this Agreement,

Being Parties to the United Nations Framework Convention on Climate Change, hereinafter referred to as "the Convention",

Pursuant to the Durban Platform for Enhanced Action established by decision 1/CP.17 of the Conference of the Parties to the Convention at its seventeenth session,

In pursuit of the objective of the Convention, and being guided by its principles, including the principle of equity and common but differentiated responsibilities and respective capabilities, in the light of different national circumstances,

Recognizing the need for an effective and progressive response to the urgent threat of climate change on the basis of the best available scientific knowledge,

Also recognizing the specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, as provided for in the Convention,

Taking full account of the specific needs and special situations of the least developed countries with regard to funding and transfer of technology,

Recognizing that Parties may be affected not only by climate change, but also by the impacts of the measures taken in response to it,

Emphasizing the intrinsic relationship that climate change actions, responses and impacts have with equitable access to sustainable development and eradication of poverty,

Recognizing the fundamental priority of safeguarding food security and ending hunger, and the particular vulnerabilities of food production systems to the adverse impacts of climate change,

Taking into account the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities,

Acknowledging that climate change is a common concern of humankind, Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity,

Recognizing the importance of the conservation and enhancement, as appropriate, of sinks and reservoirs of the greenhouse gases referred to in the Convention,

Noting the importance of ensuring the integrity of all ecosystems, including oceans, and the protection of biodiversity, recognized by some cultures as Mother Earth, and noting the importance for some of the concept of "climate justice", when taking action to address climate change,

Affirming the importance of education, training, public awareness, public participation, public access to information and cooperation at all levels on the matters addressed in this Agreement,

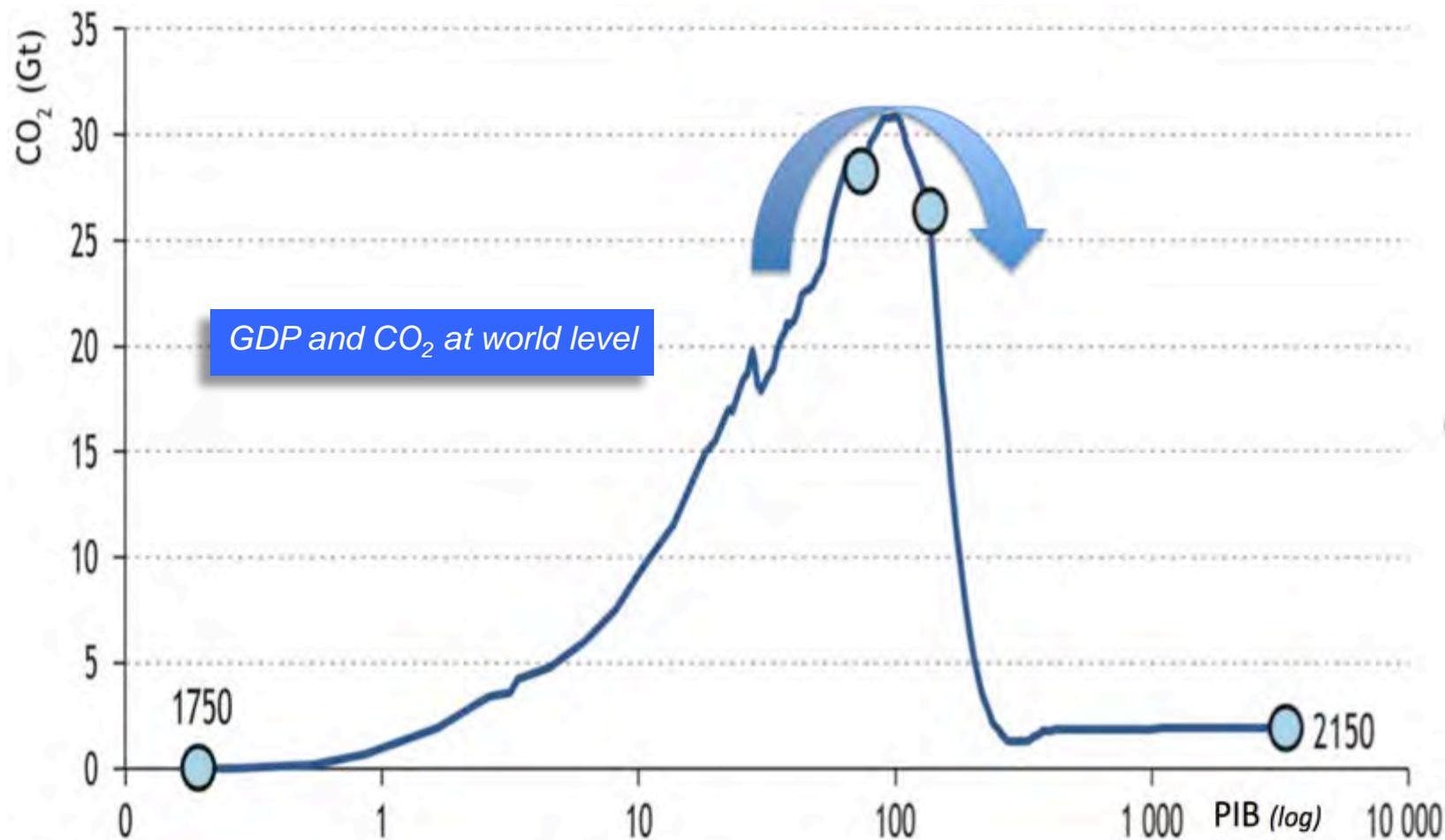
Recognizing the importance of the engagements of all levels of government and various actors, in accordance with respective national legislations of Parties, in addressing climate change,

"Its long-term objectives set the bar very high in terms of ambition, be it on temperature rise limits, emissions trajectory, resilience or the shifting of financial flows.

*The INDC and stock-taking process should be **dynamic** enough to enable Parties to reach these objectives over time."*

(Laurent Fabius, COP 21 President, Dec 12 2016)

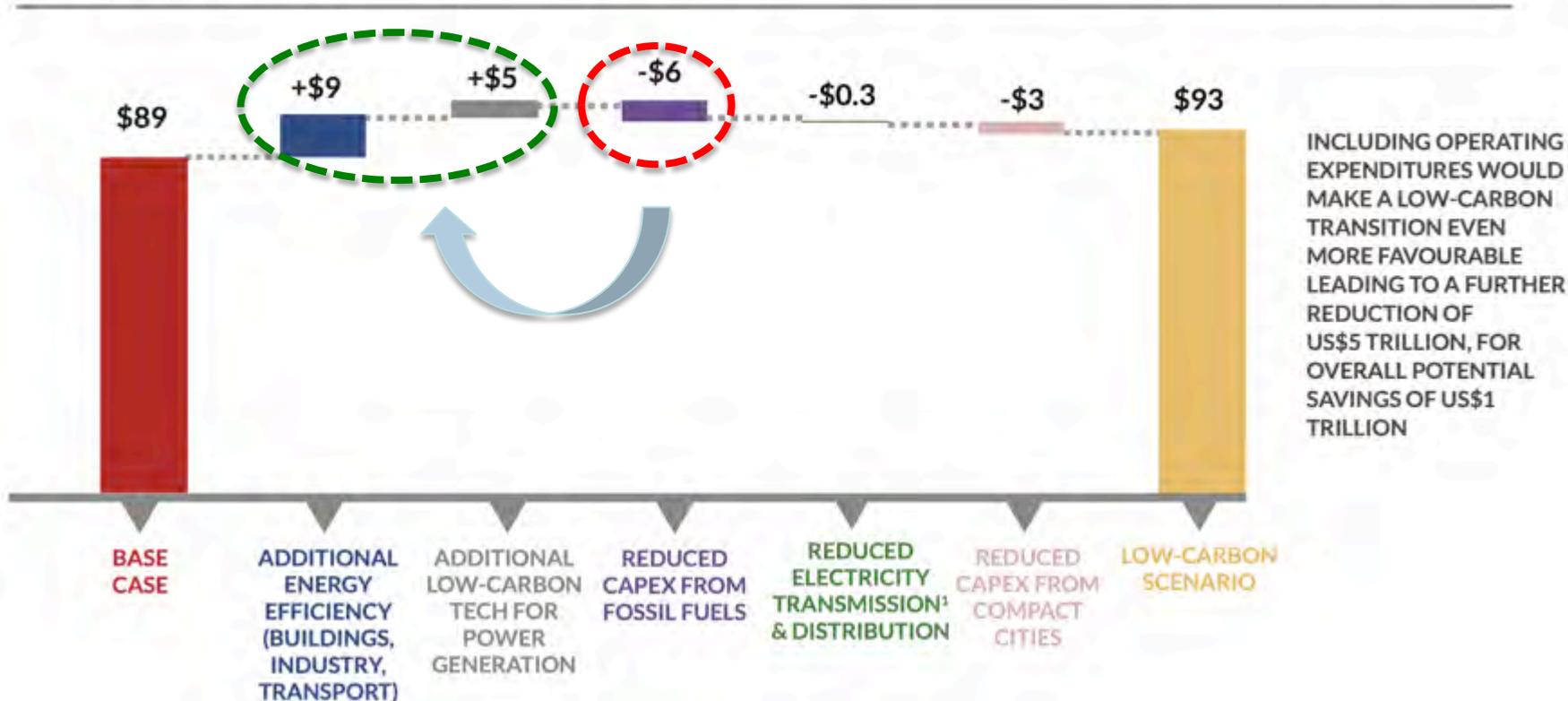
... really means: redefining the world macroeconomic model



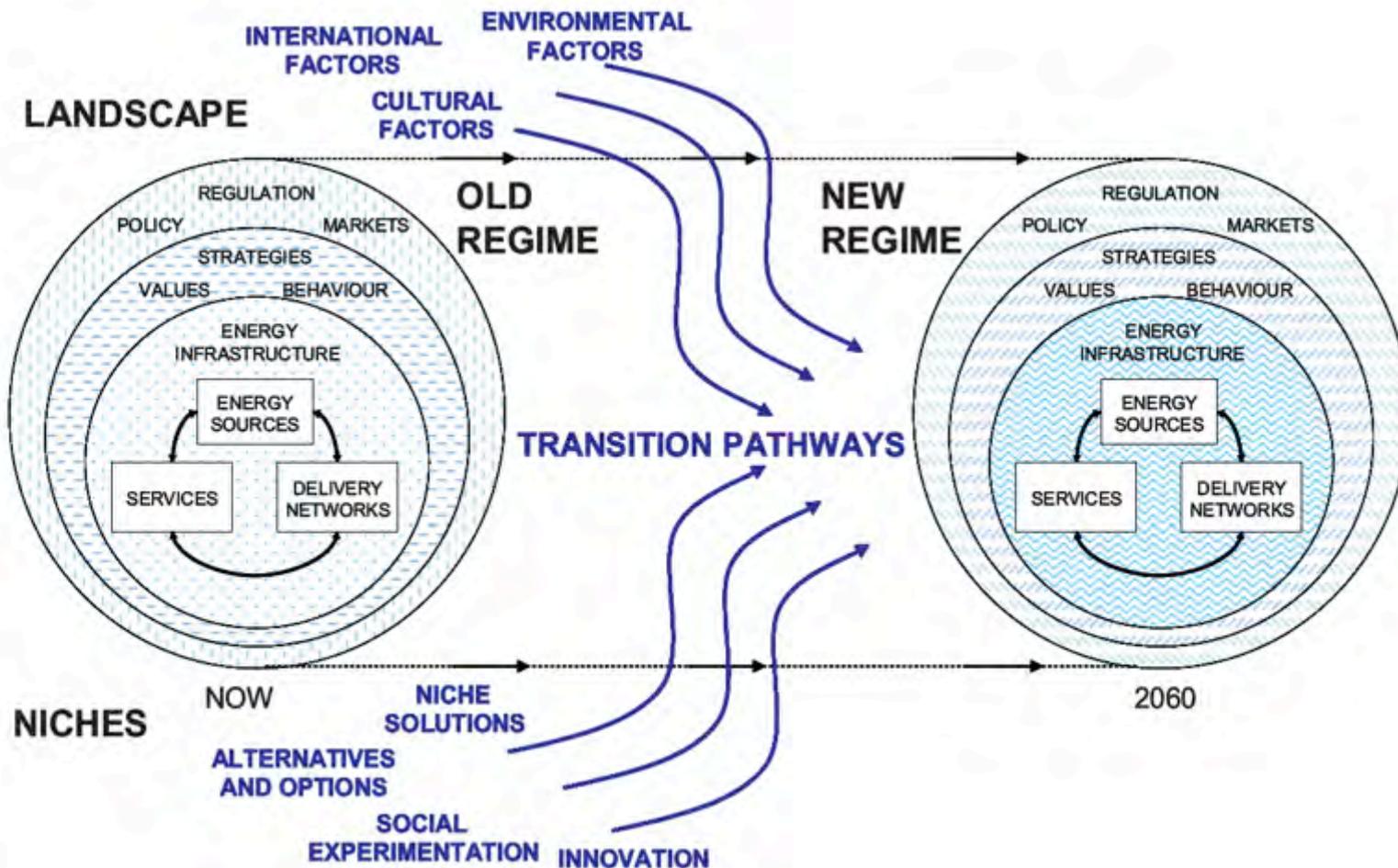
Massive reallocations other the medium term

GLOBAL INVESTMENT REQUIREMENTS, 2015 TO 2030,
US\$ TRILLION, CONSTANT 2010 DOLLARS

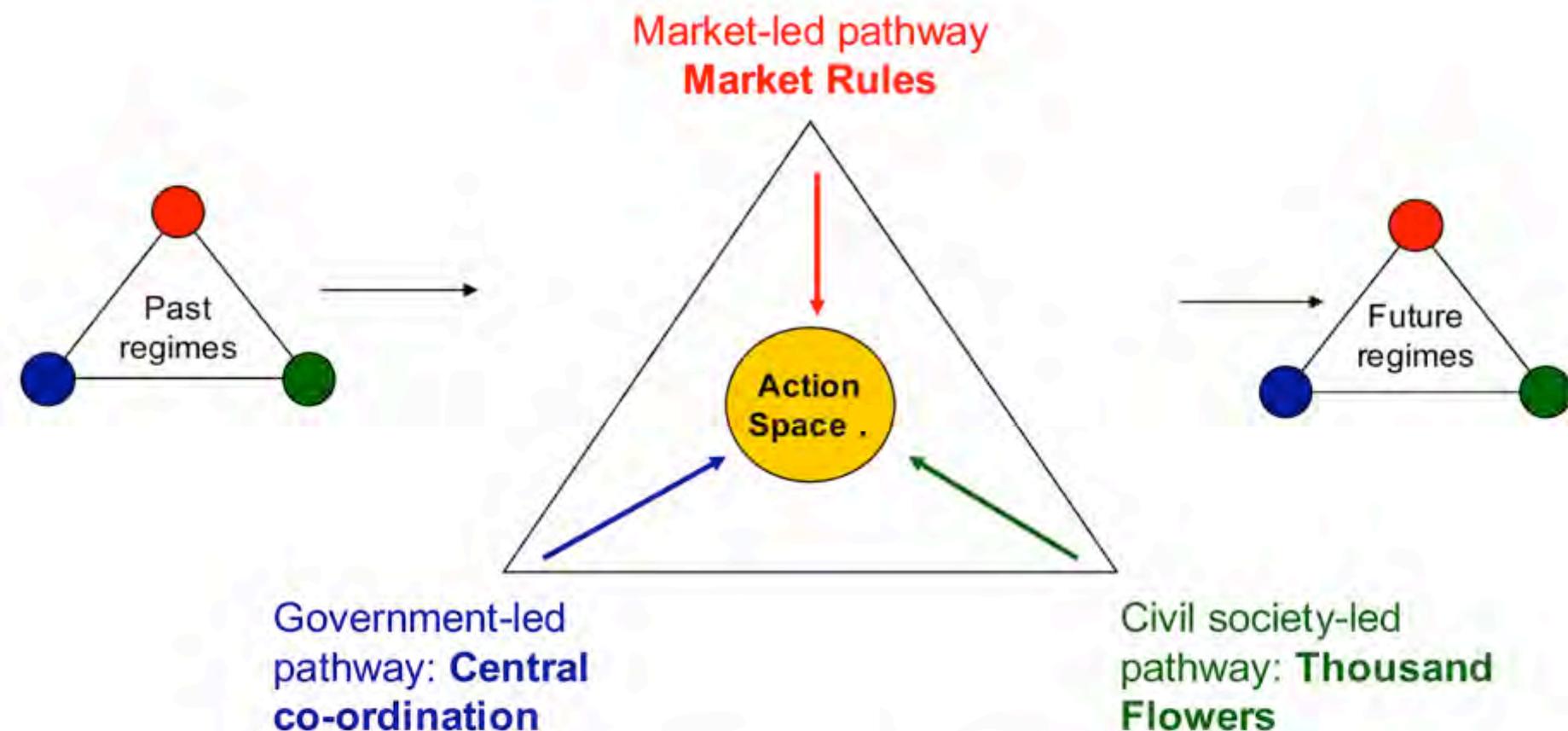
Indicative figures only
High rates of uncertainty



Transition pathways (1/2)



Transition pathways (2/2)

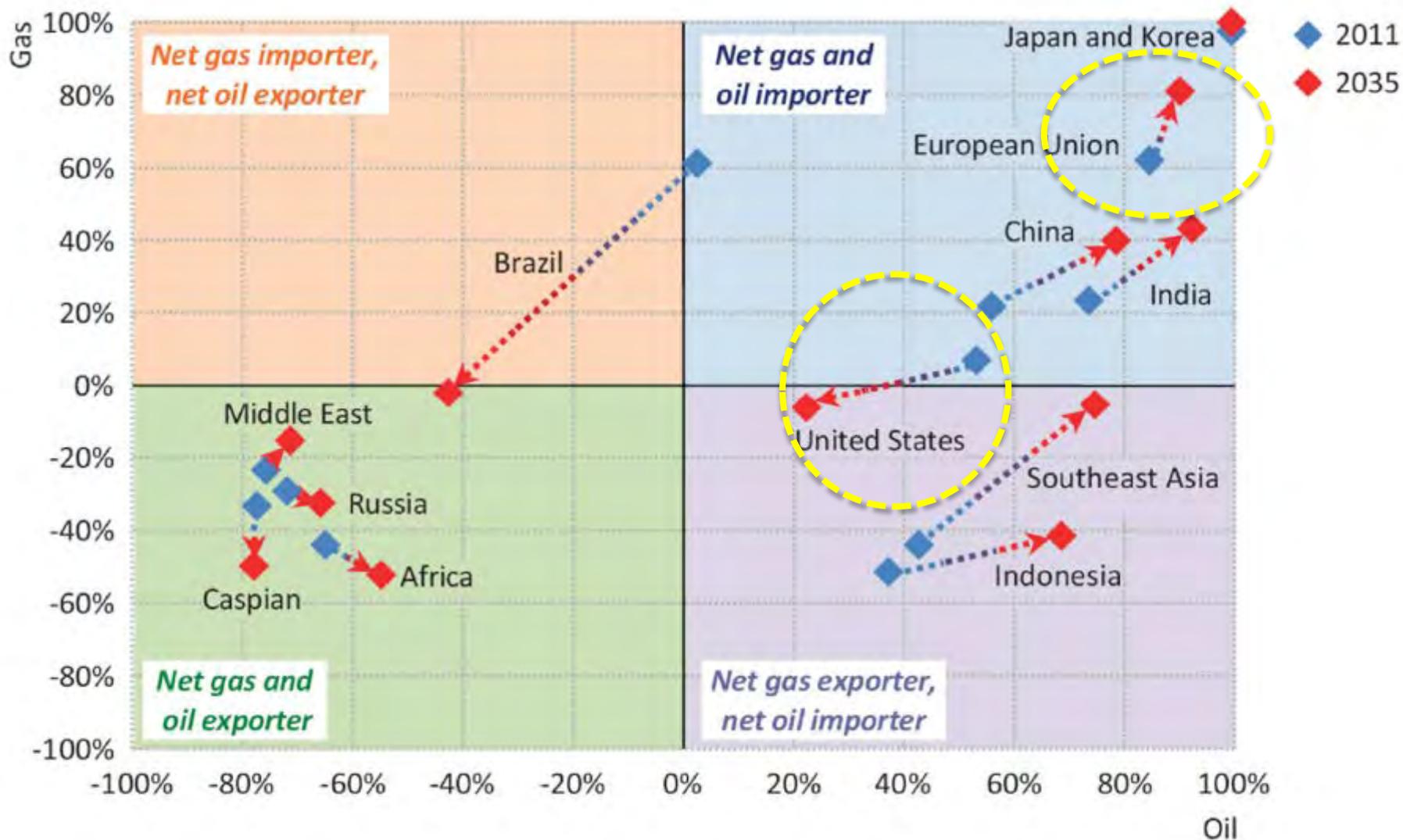


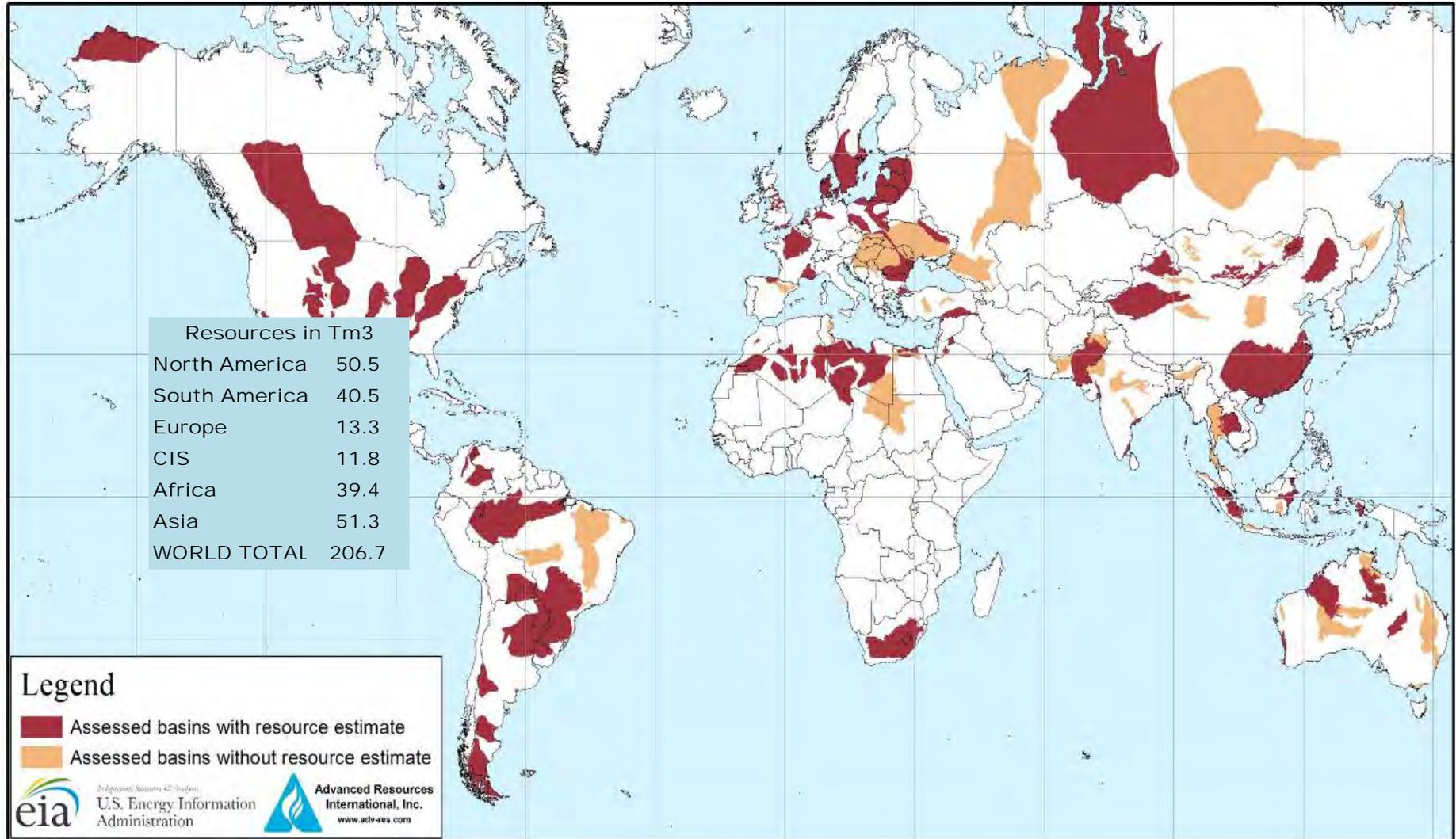
Three core transition pathway in which market, government and civil society logics respectively dominate.

Outline

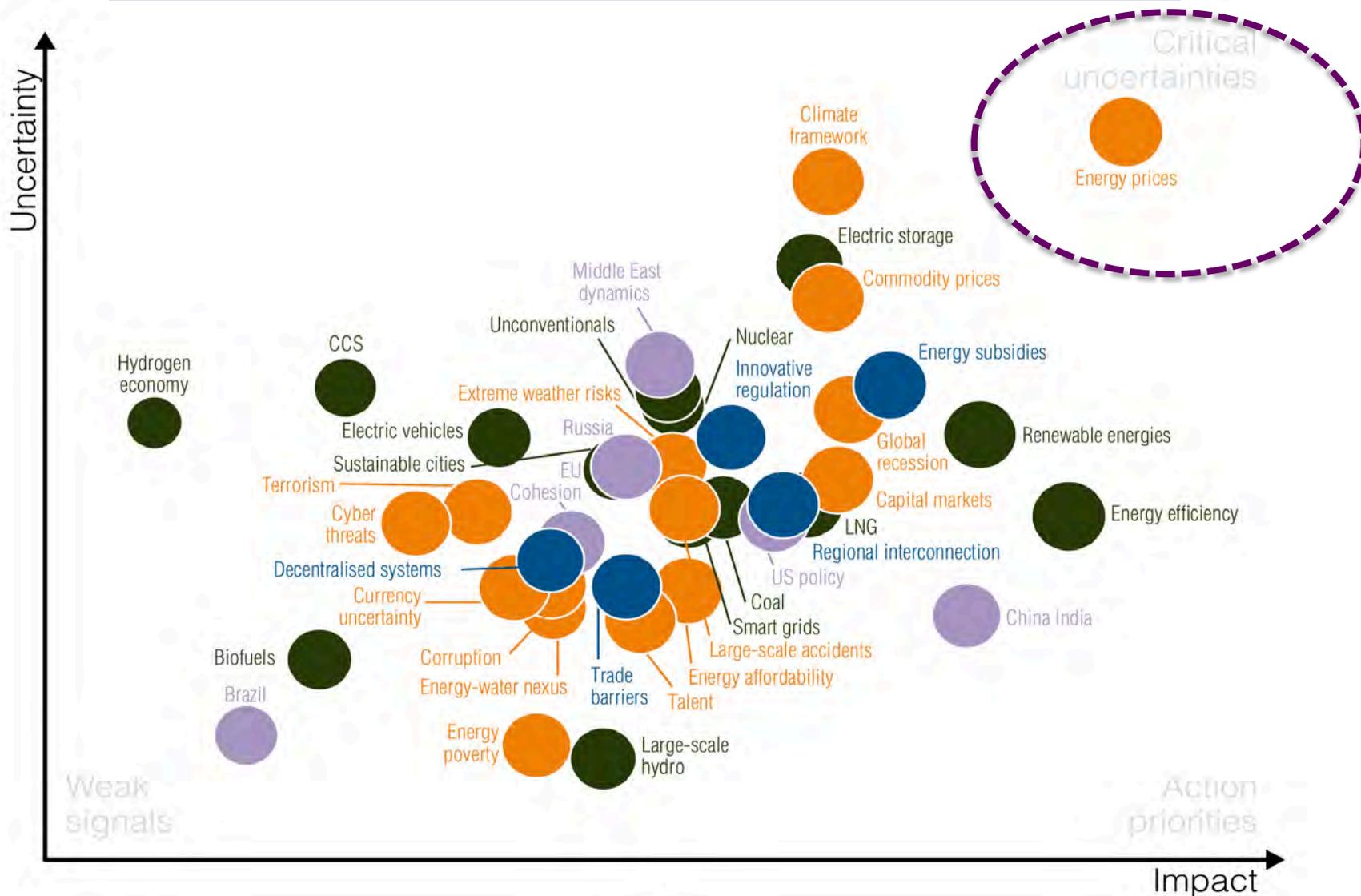
- ⇒ COP 21: the Paris Agreement as new “framework” for good energy policies
- ⇒ **Good energy policies: Dealing with an extended (and highly complex) core of constraints**
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Dealing with (new) geopolitical risks (1/2)

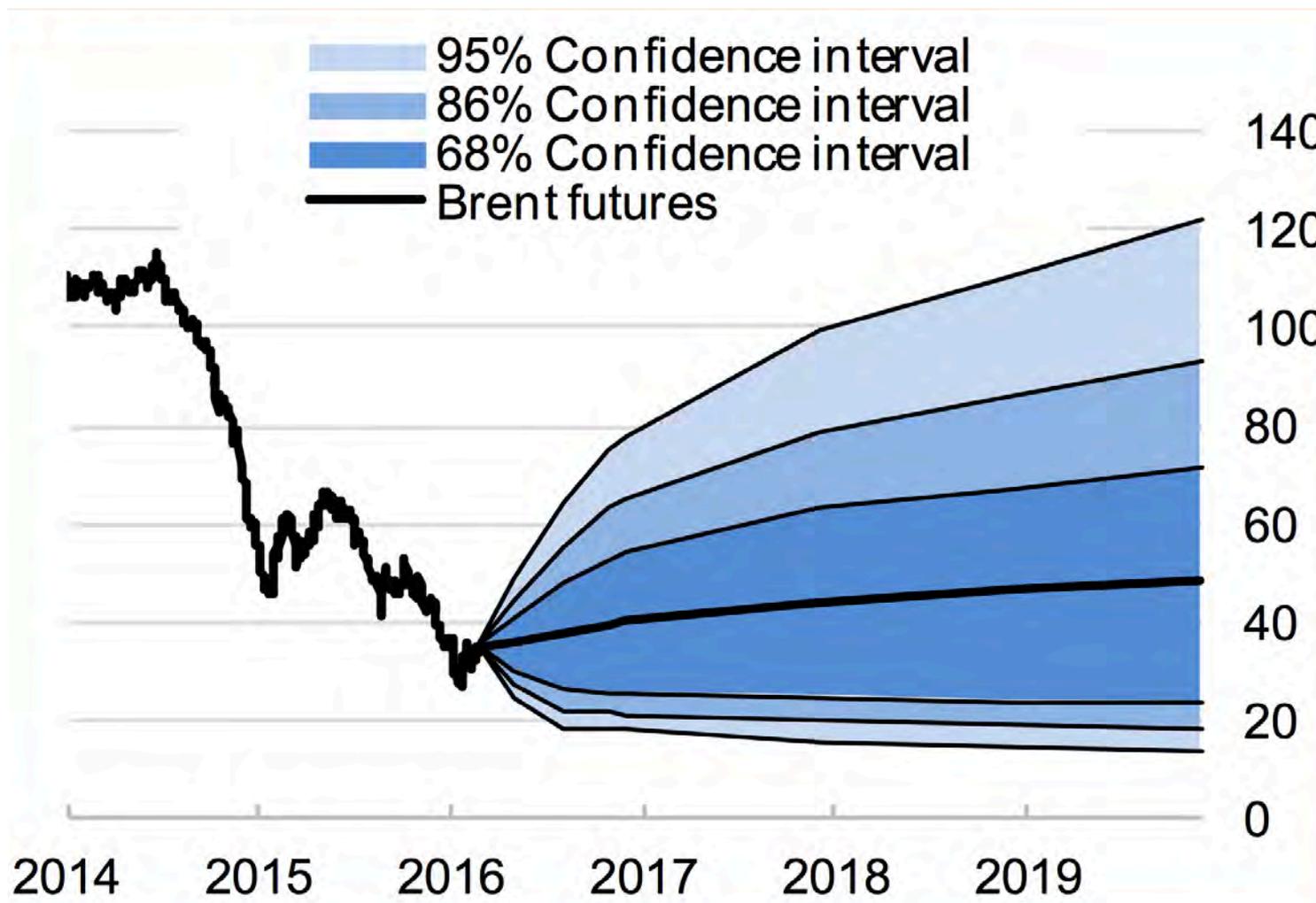




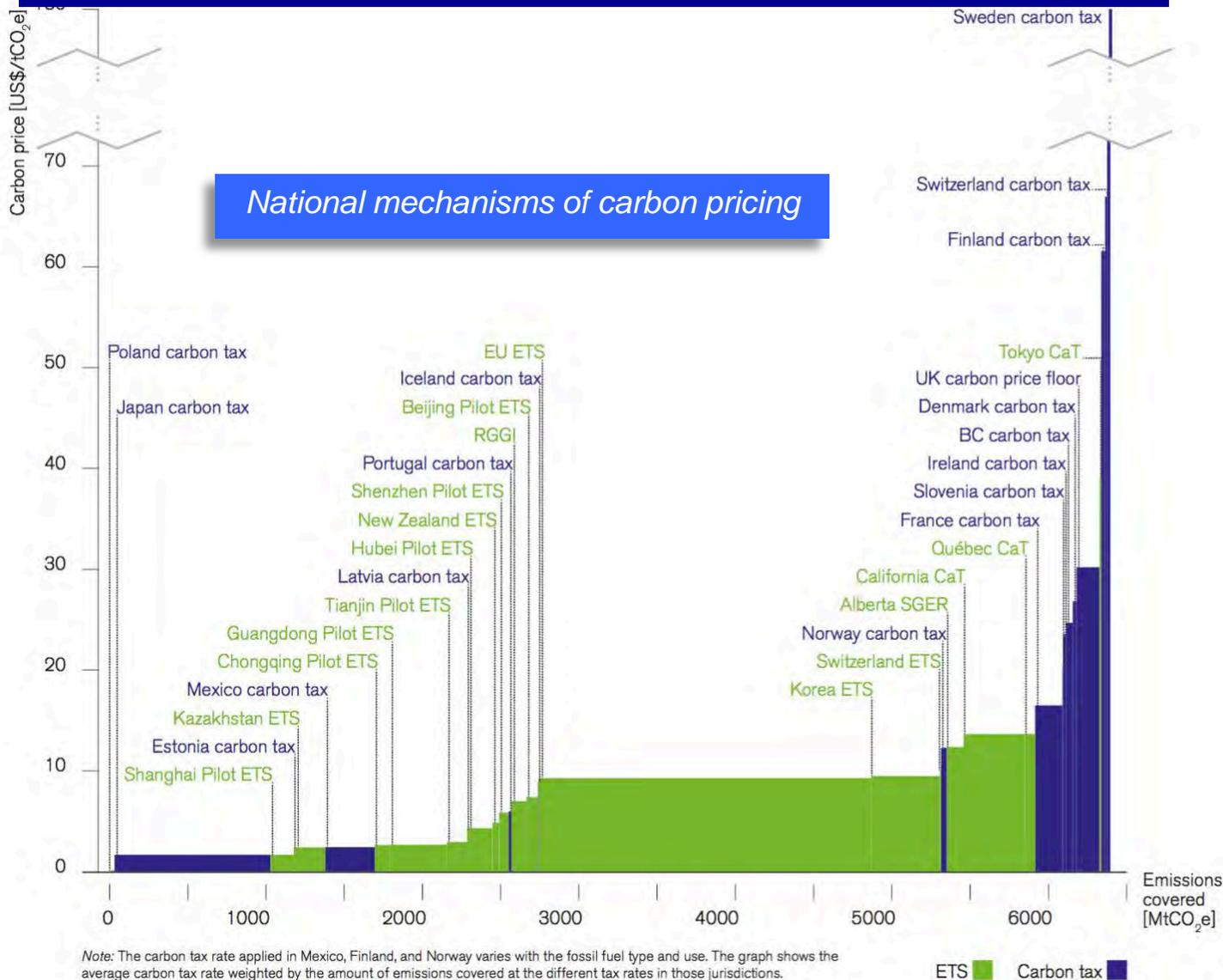
In search of consistent price signals (1/4)



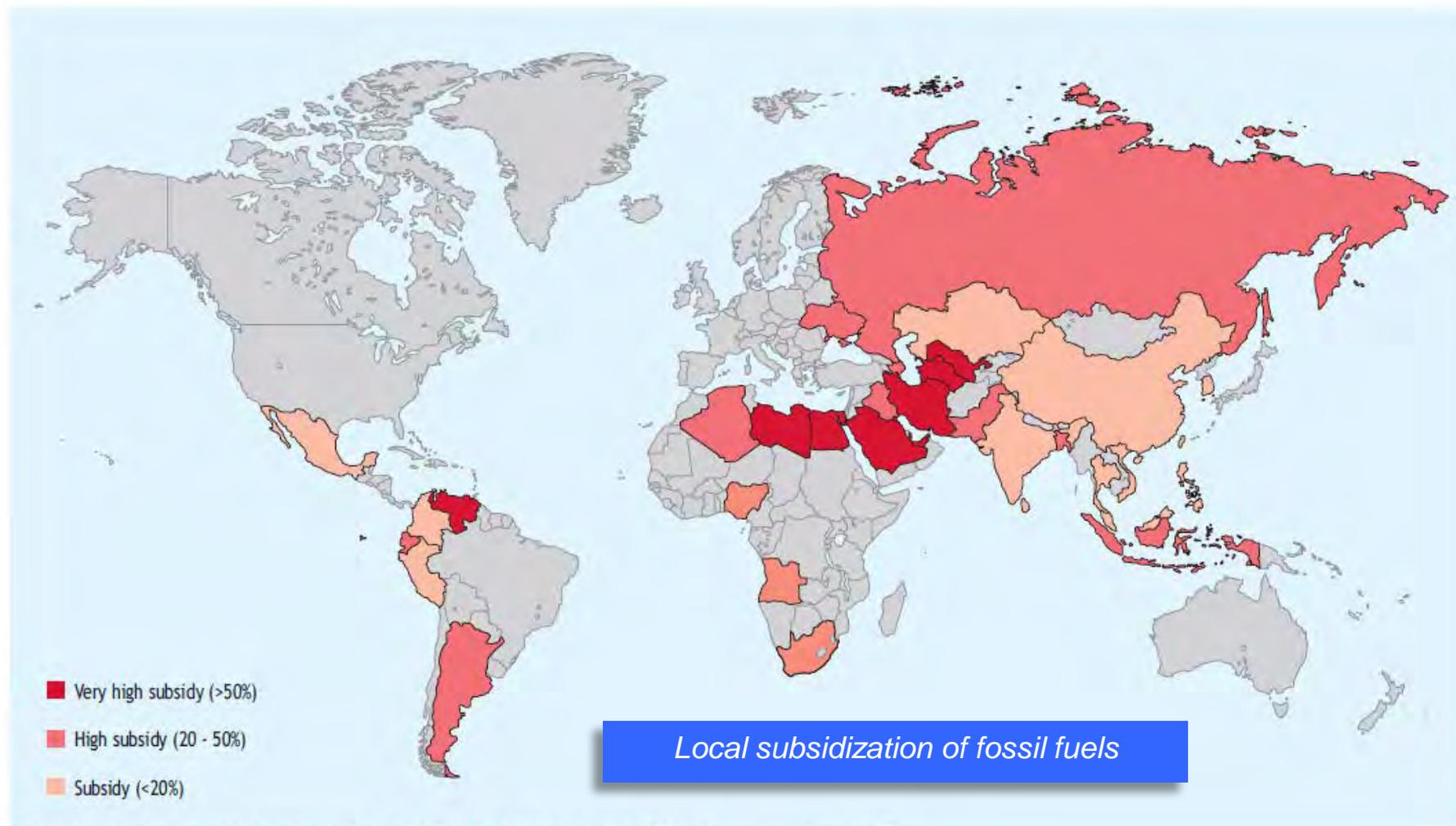
In search of consistent price signals (2/4)



In search of consistent price signals (3/4)

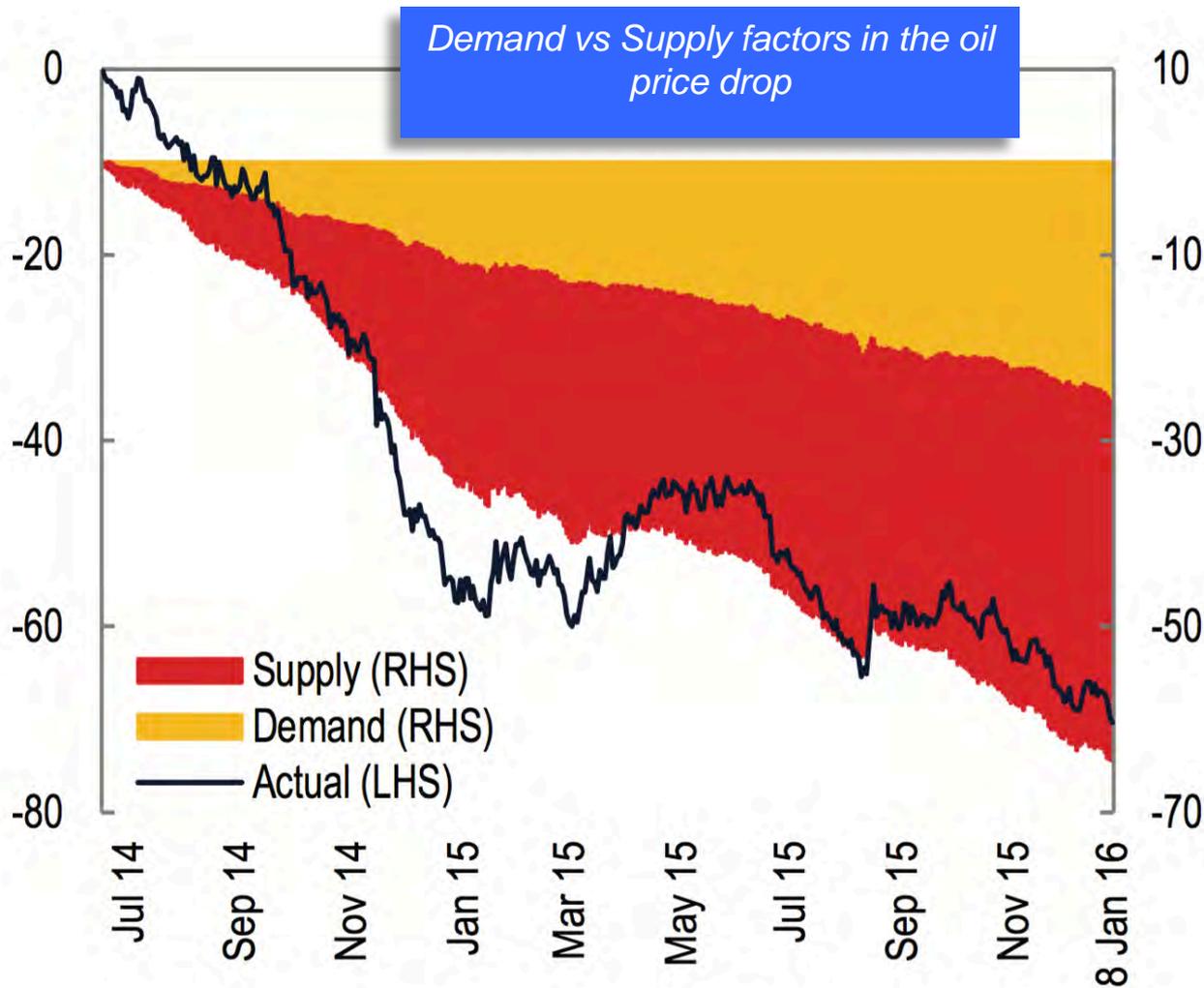


In search of consistent price signals (4/4)

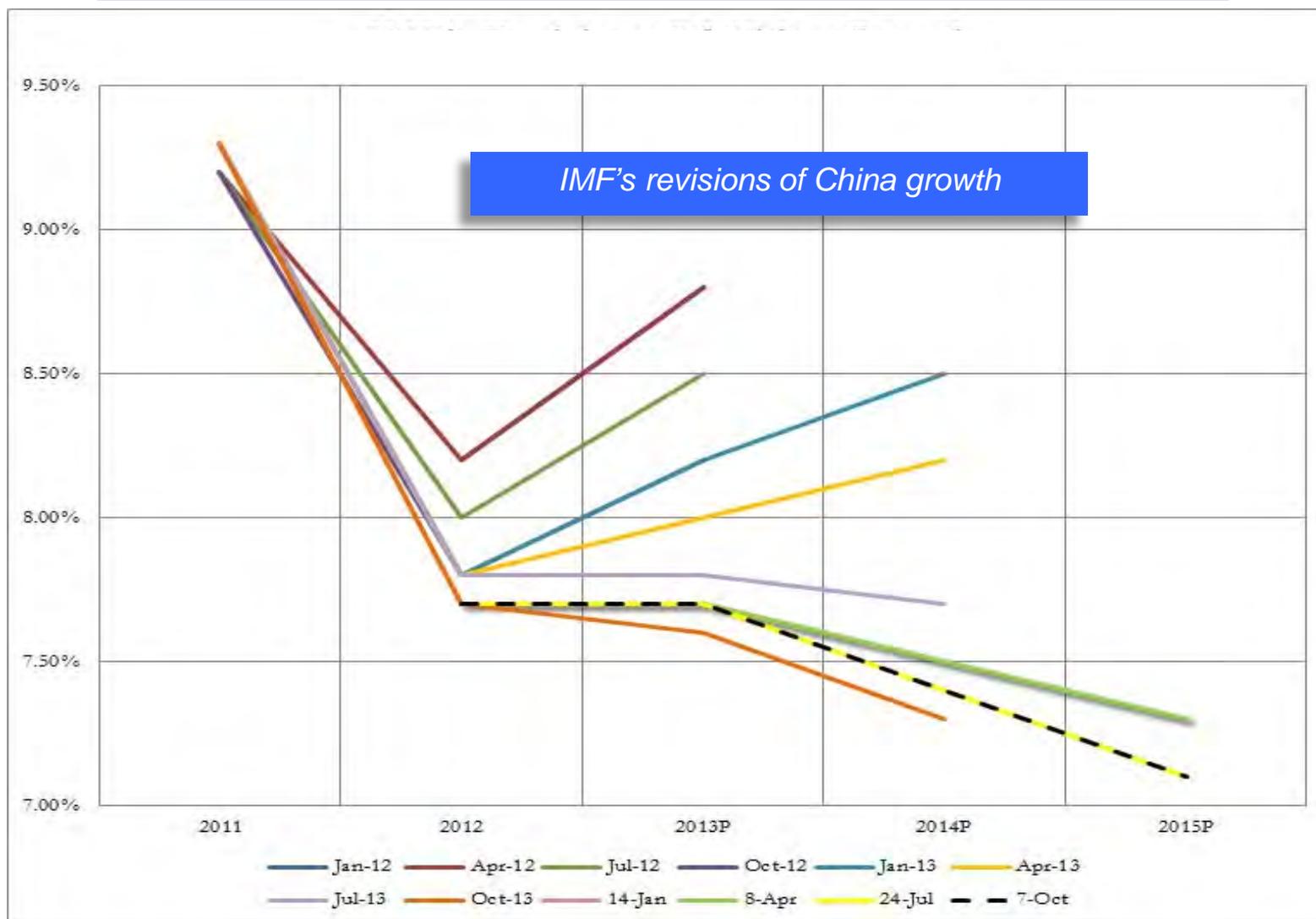


The boundaries and names shown and the designations used on maps included in this publication do not imply official endorsement or acceptance by the IEA.

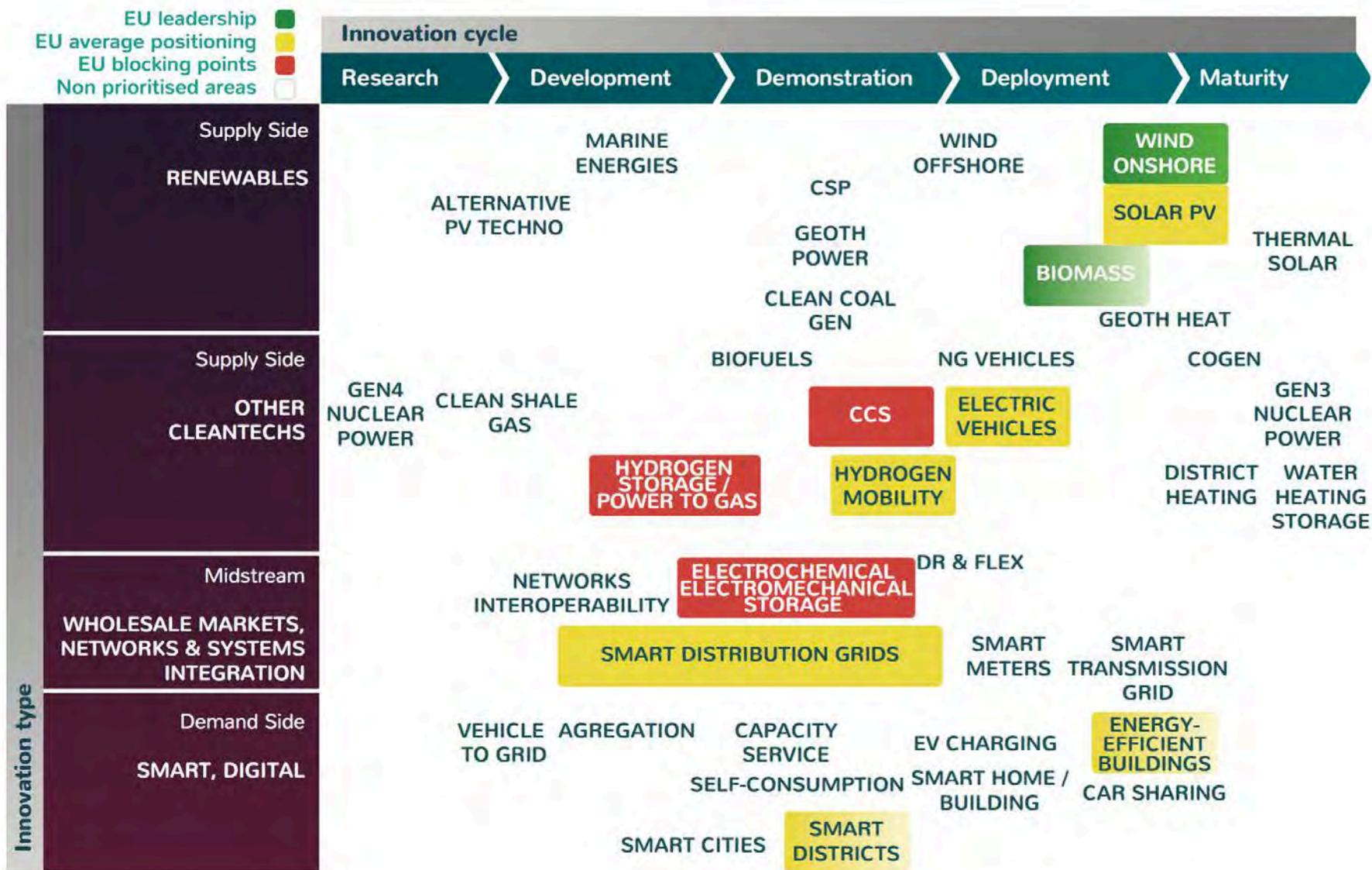
Facing macroeconomic shocks (1/2)



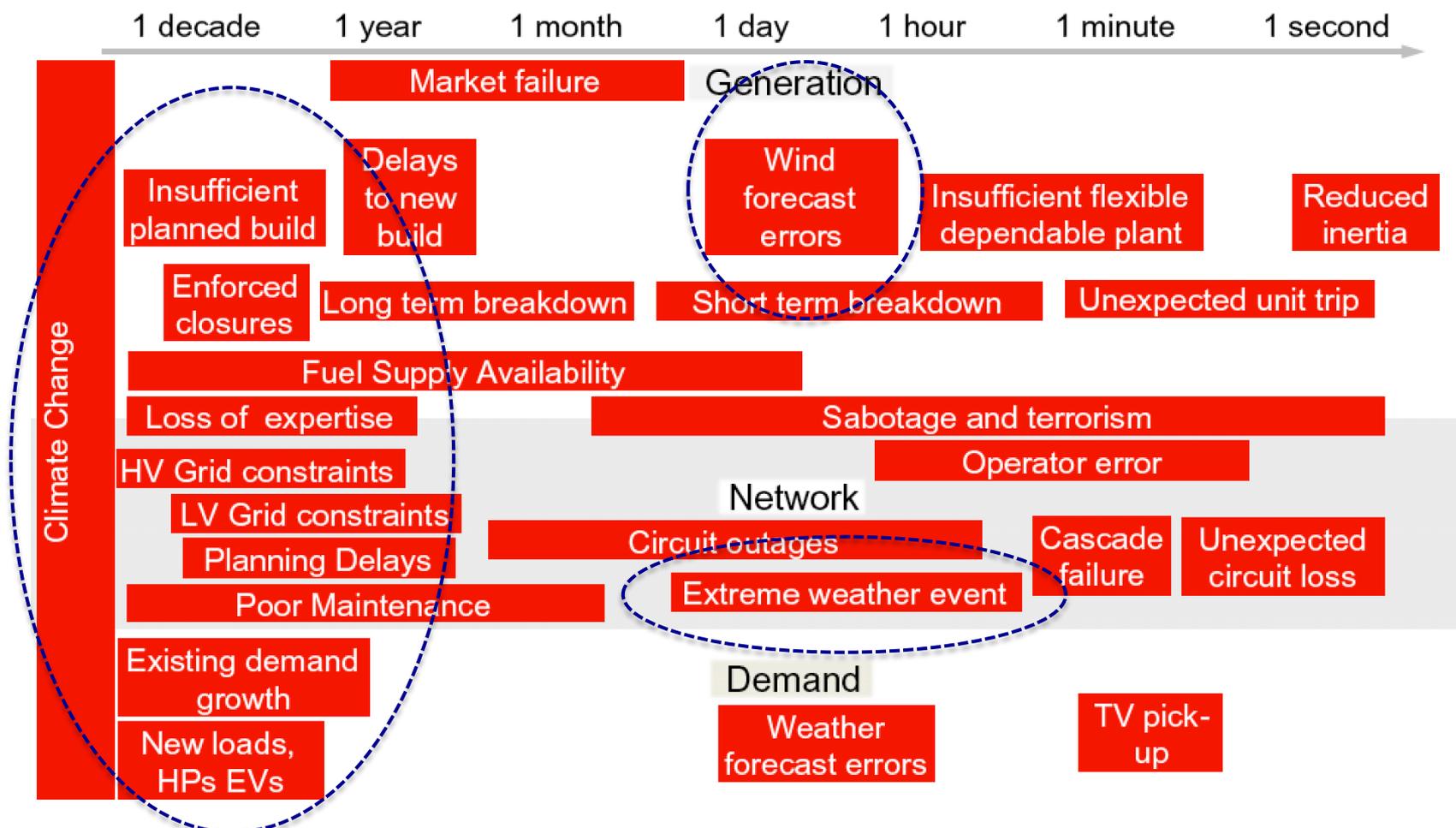
Facing macroeconomic shocks (2/2)



Facing a Darwinian technological portfolio

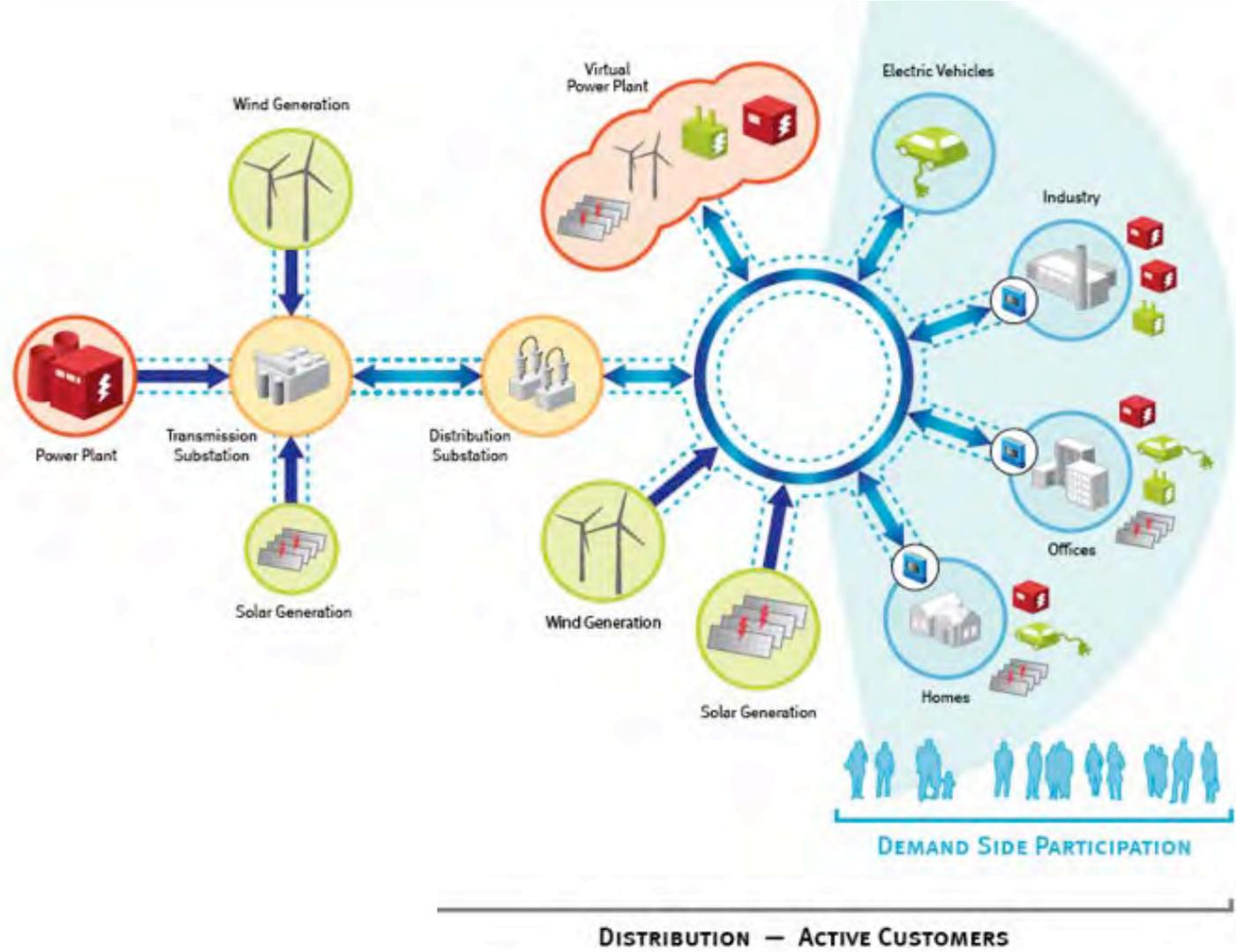


Managing new risks...



Timescales of threats to power system security

... and new supply-demand interactions...



... and potential disruptions?



Low carbon technologies in the globalized competition (1/2)

TOP 5 Solar Panel Manufacturers [Ranked by shipment guidance (GW)]

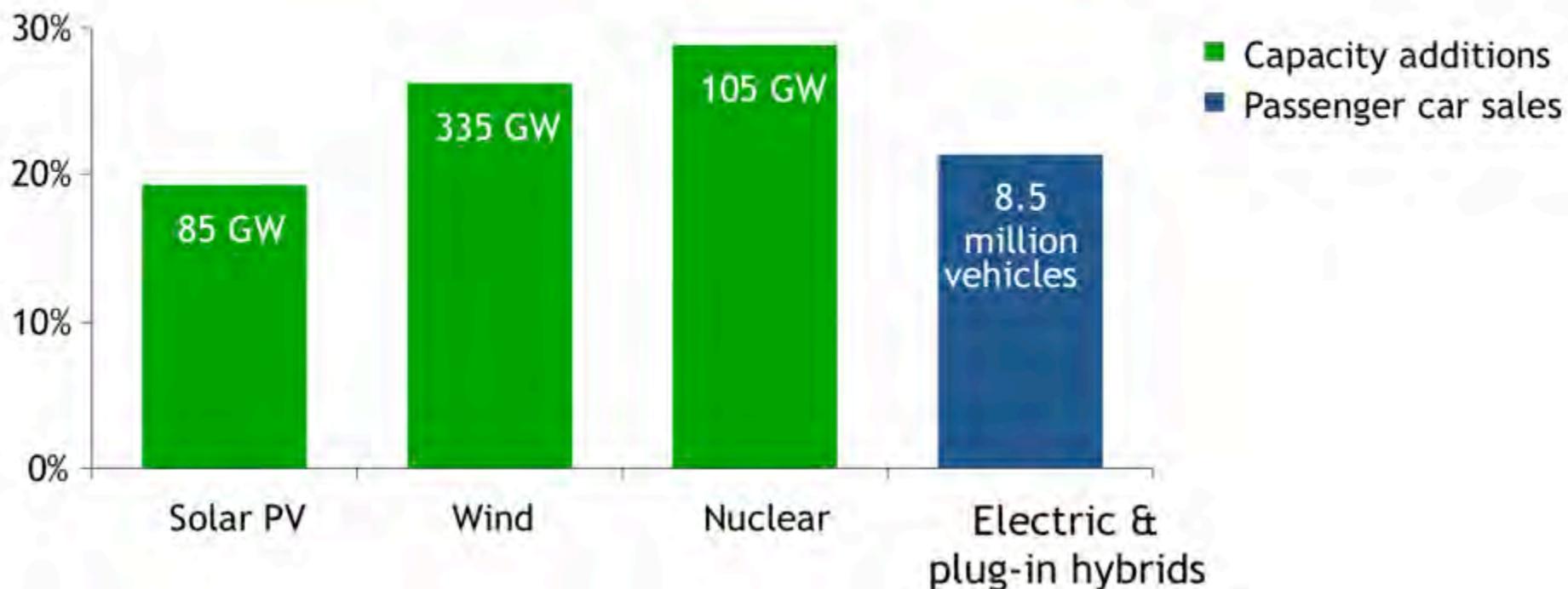
2008		2015	
 1. Sharp	 1. Trina Solar		
 2. First Solar	 2. Yingli Green Energy		
 3. Yingli Green Energy	 3. Canadian Solar		
 4. Kyocera	 4. Hanwha SolarOne		
 5. Trina Solar	 5. Jinko Solar		

TOP 10 Wind Turbine Manufacturers (Ranked by Global Market Share)

2008		2015	
 1. Vestas	 6. Sulzon	 1. Goldwind	 6. Enercon
 2. GE	 7. Sinovel	 2. Vestas	 7. Guodian
 3. Gamesa	 8. Goldwin	 3. GE	 8. Ming Yang
 4. Enercon	 9. Dongfang	 4. Siemens	 9. Envision
 5. Siemens	 10. Nordex	 5. Gamesa	 10. CSIC

Low carbon technologies in the globalized competition (2/2)

China's share of cumulative global additions to 2035

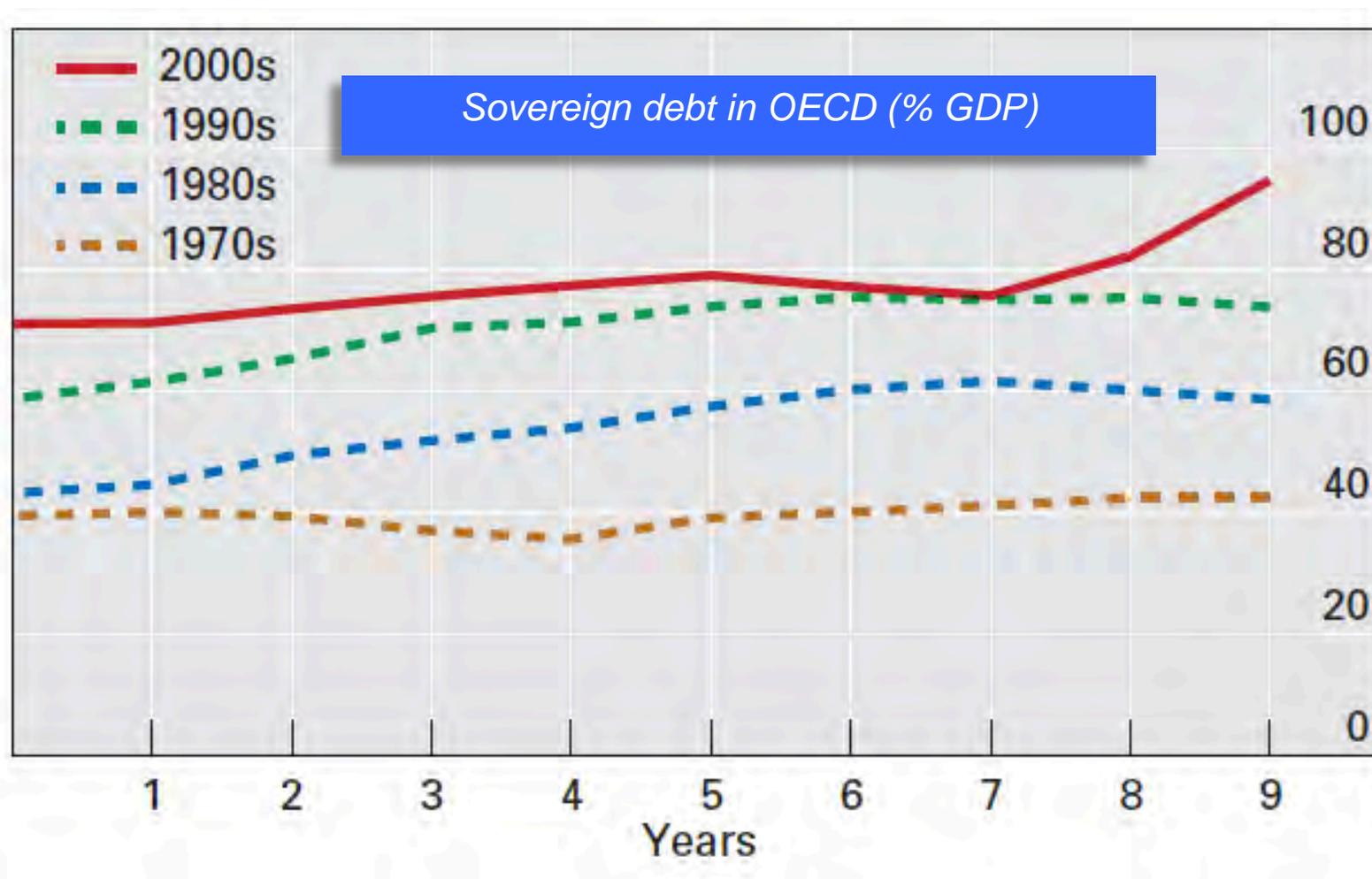


Given the sheer scale of China's market, its push to expand the role of low-carbon energy technologies is poised to play a key role in driving down costs

Managing stranded assets?

	Equity	Debt	Total	Total as % of total assets
Banks	98	365 ^a	463	1.3
Pension funds	196 ^b	60	256	5.0
Insurers	109	233	342	4.4
Total				
- in €bn	403	658	1061	
- in % of total	38%	62%	100%	

Facing public funds scarcity



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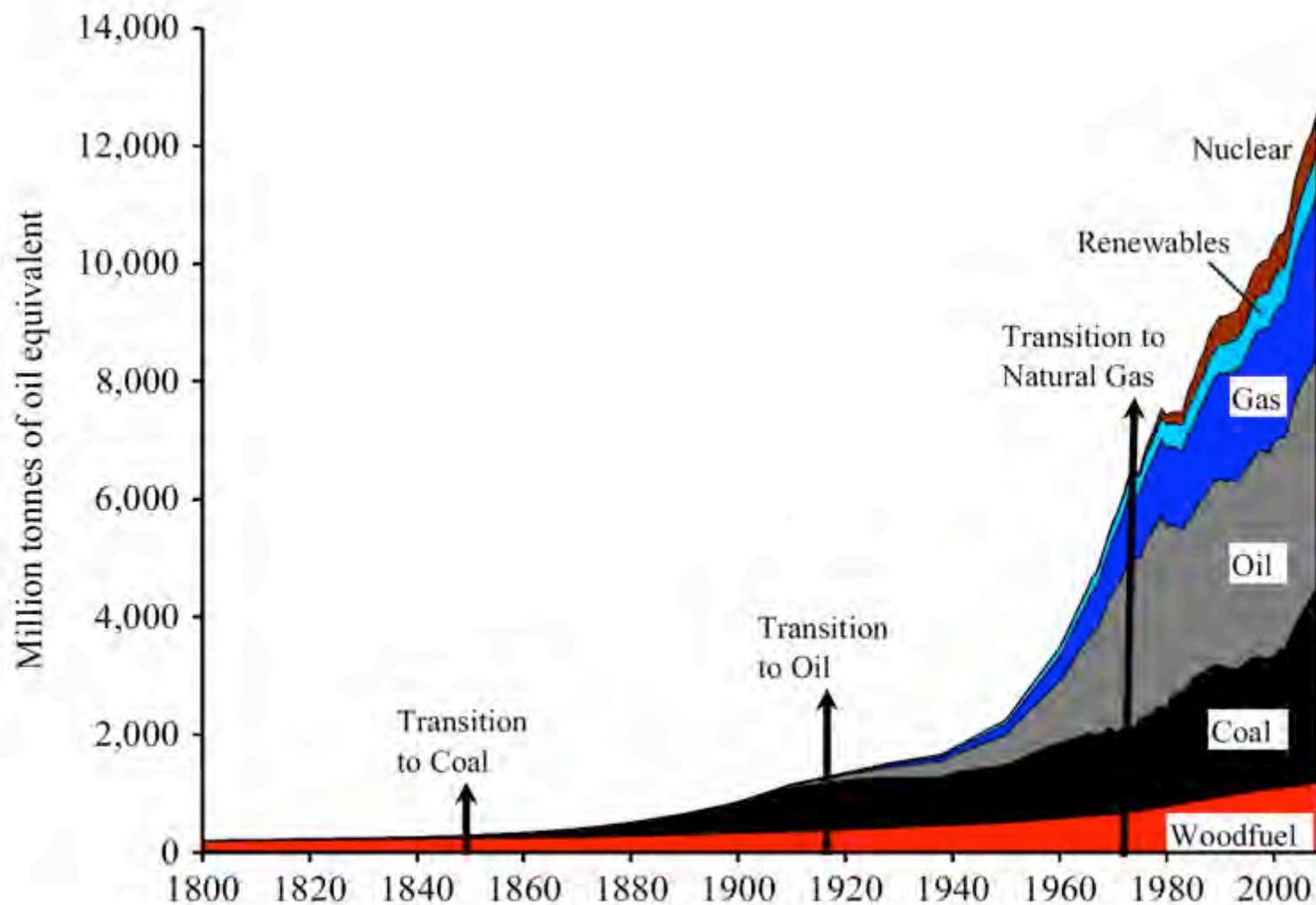
Some (very cautious) conclusions

- **In a Darwinian world, good energy policies are evolutionary processes**
- **For European countries, no good energy policies without coordination with neighbors**
- **Energy efficiency is part of least regret option**
- **The real issue will be to integrated energy decisions in complex urban areas (“smart cities”)**
- **Most human beings are not prepared to face abrupt energy transitions**

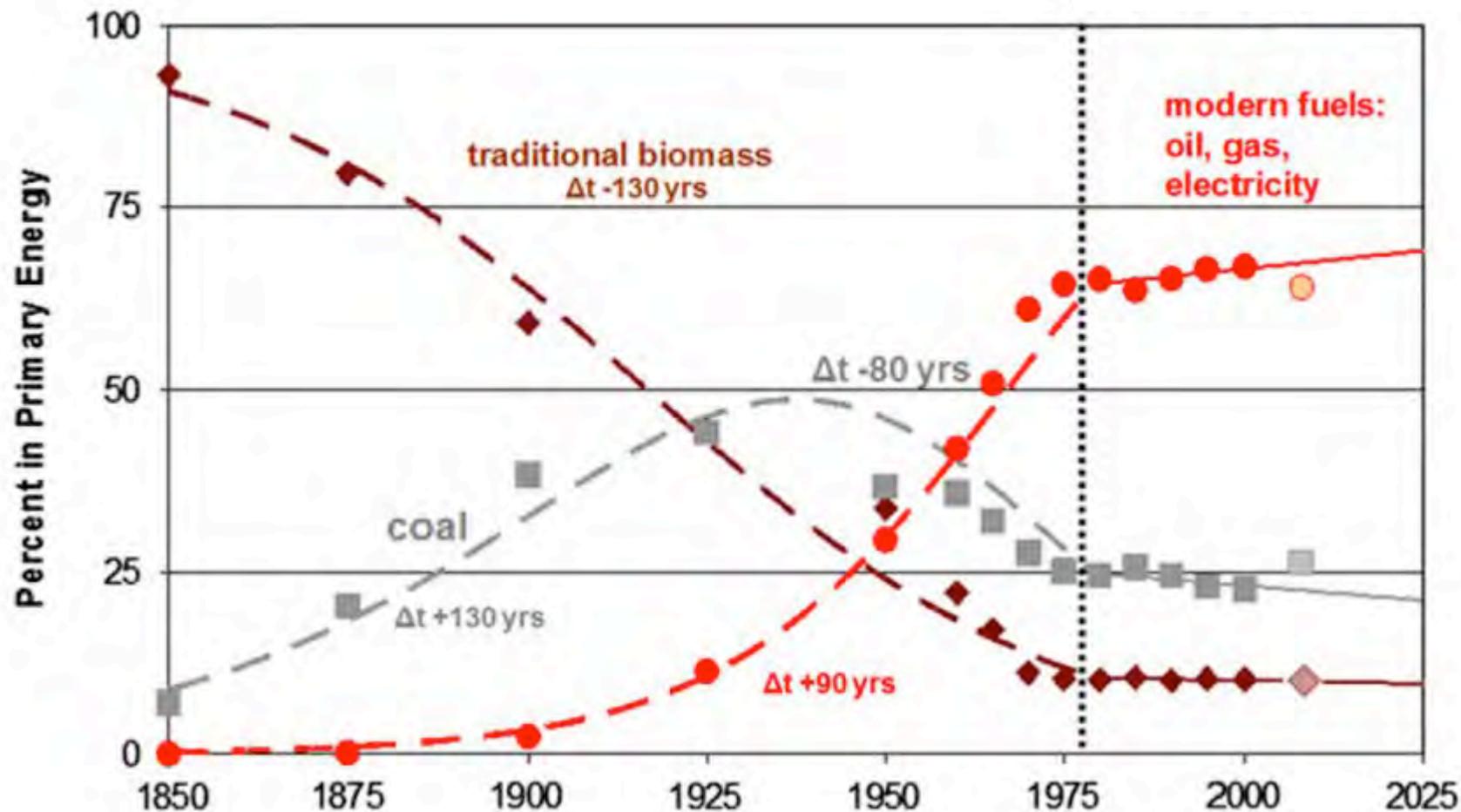
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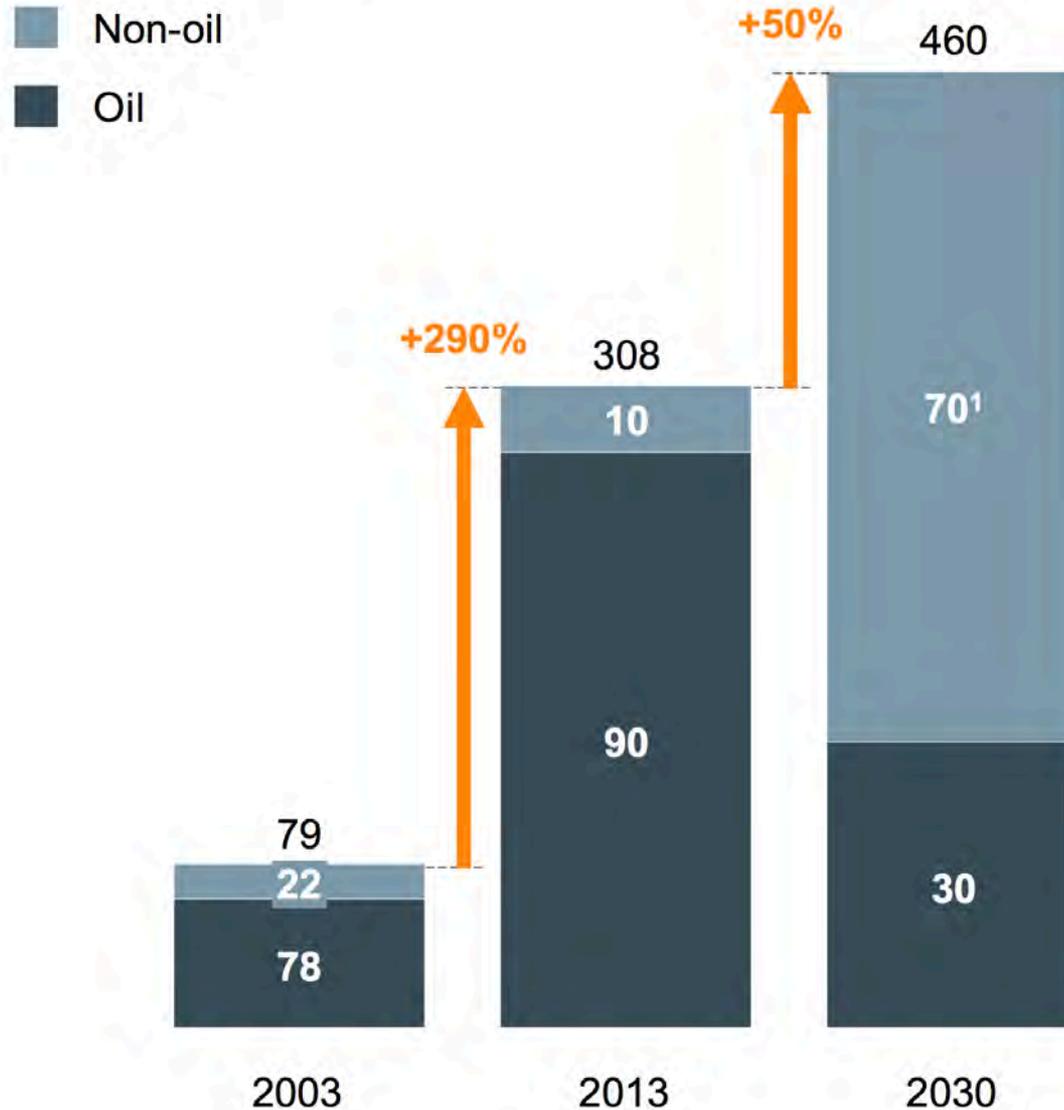
Past transitions (1/2)



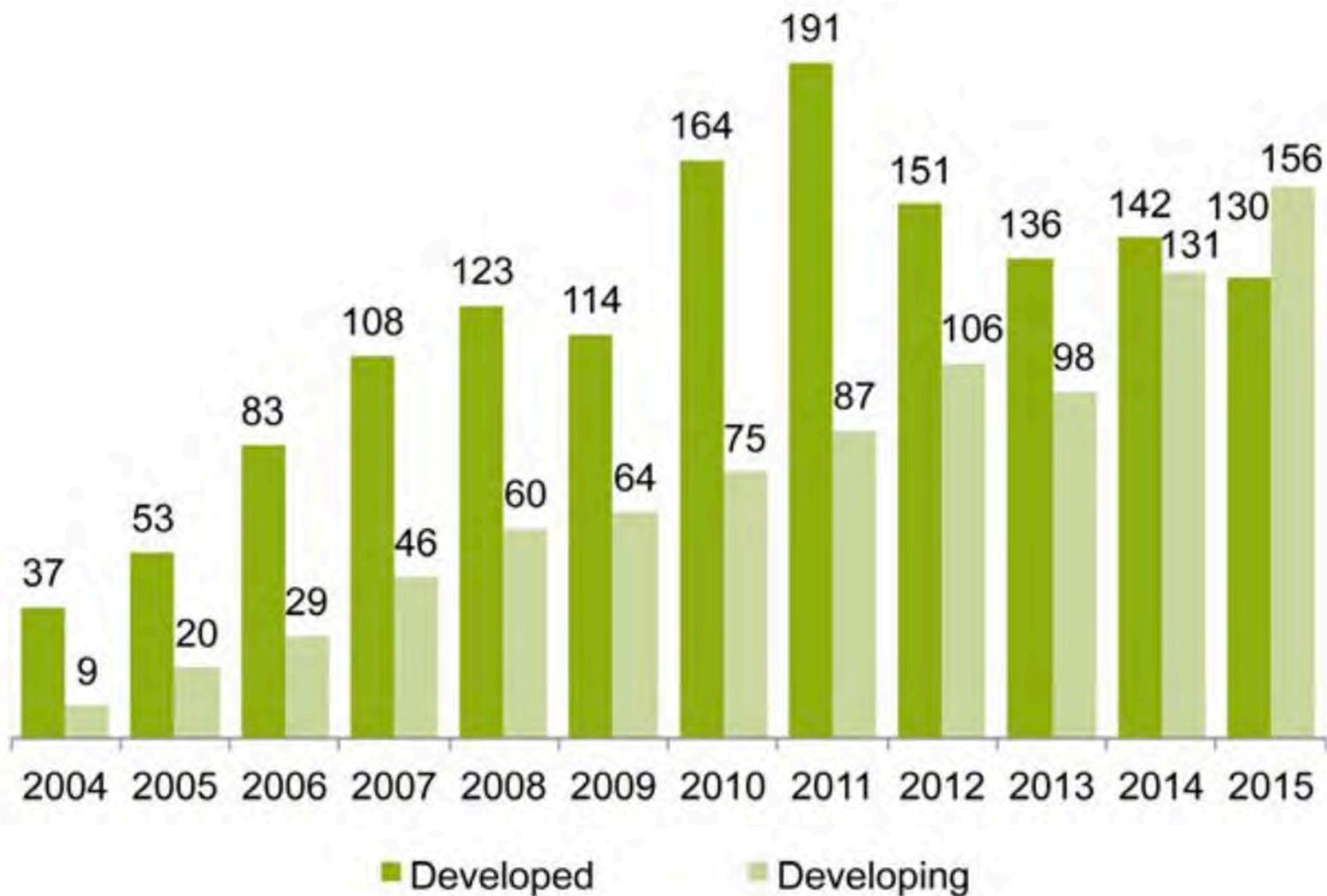
Past transitions (2/2)



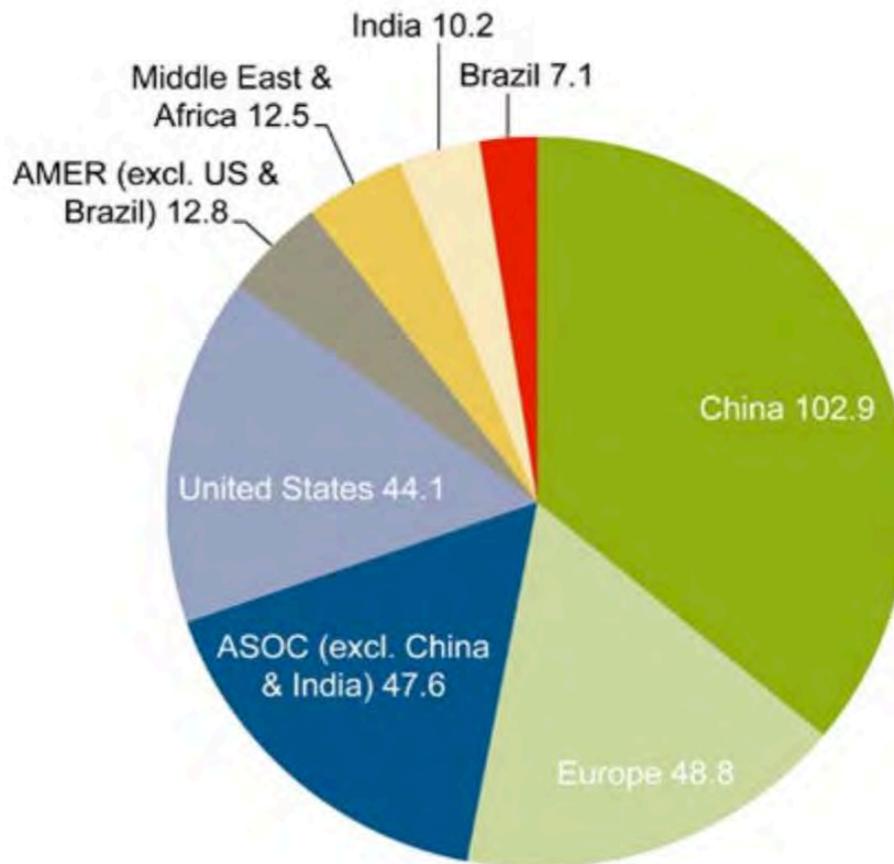
Saudi government revenues --> 2030



Green investments by developed/developing countries



New investments in renewables (2015, \$BN)



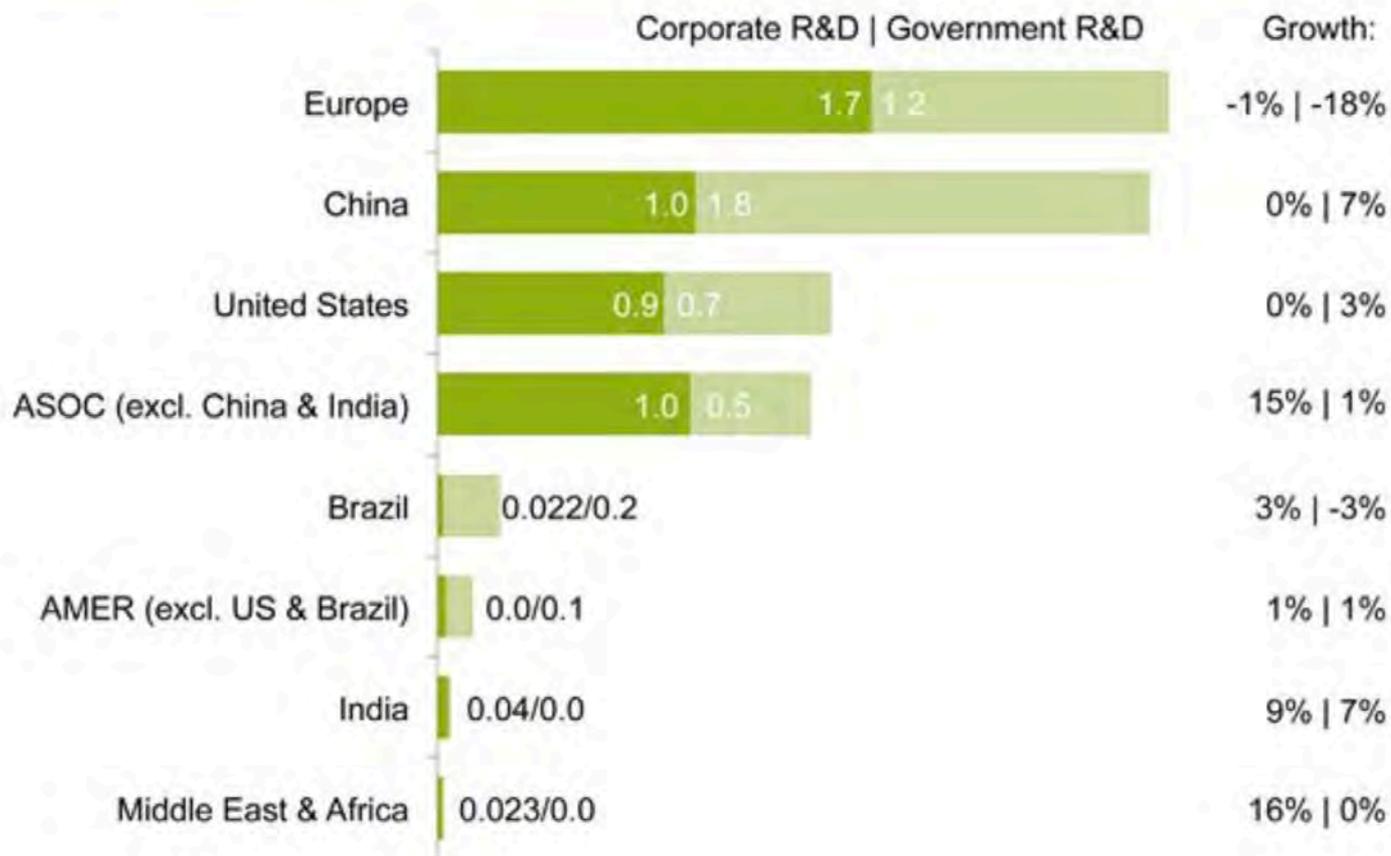
Investment volume adjusts for re-invested equity. Total values include estimates for

Electric vehicles sales



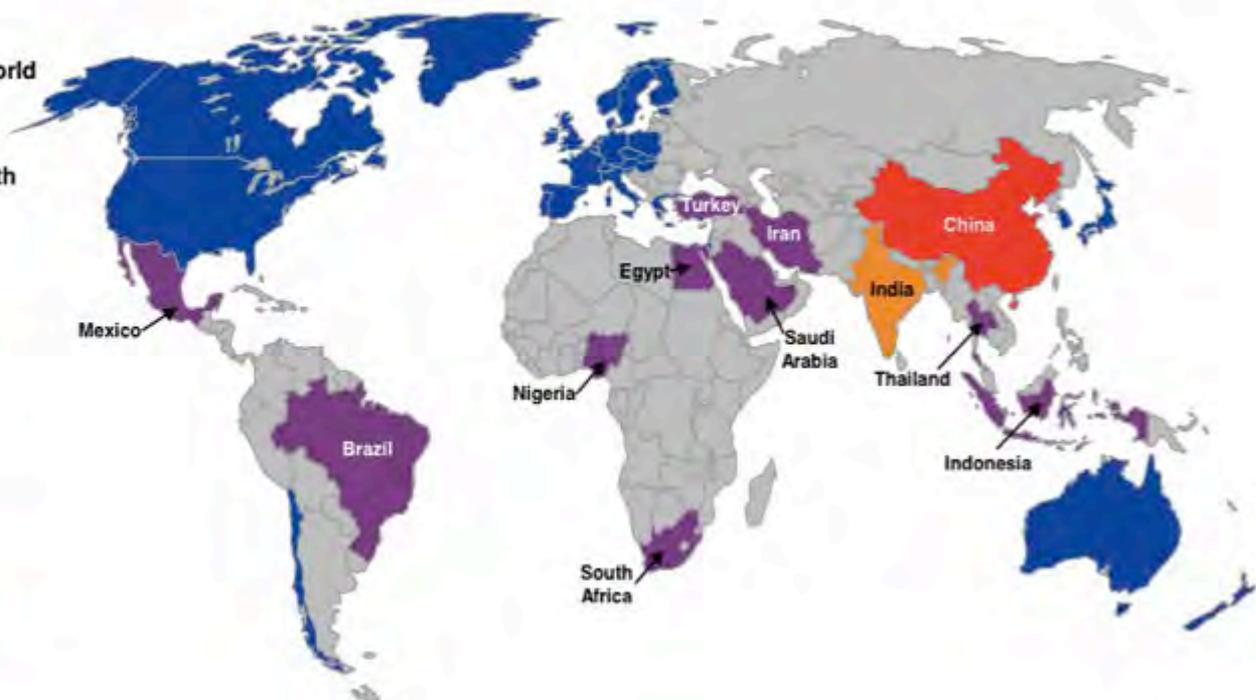
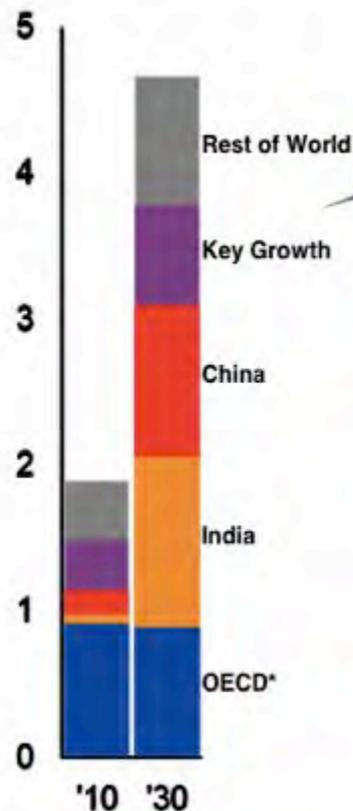
Source: Bloomberg New Energy Finance

“Renewable R&D” in 2015 (\$BN)



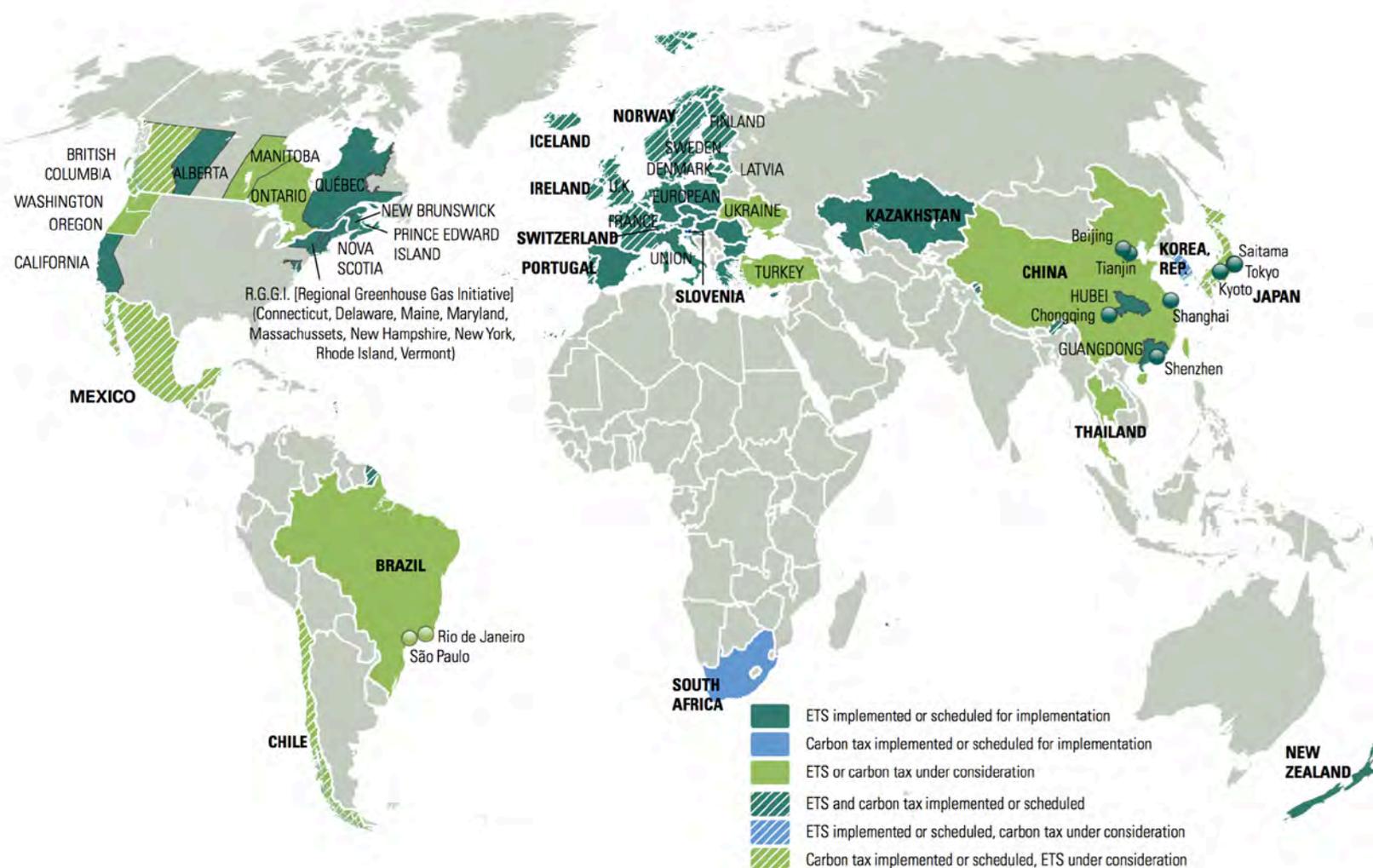
The “middle classes” pressure on energy demand

Billion People

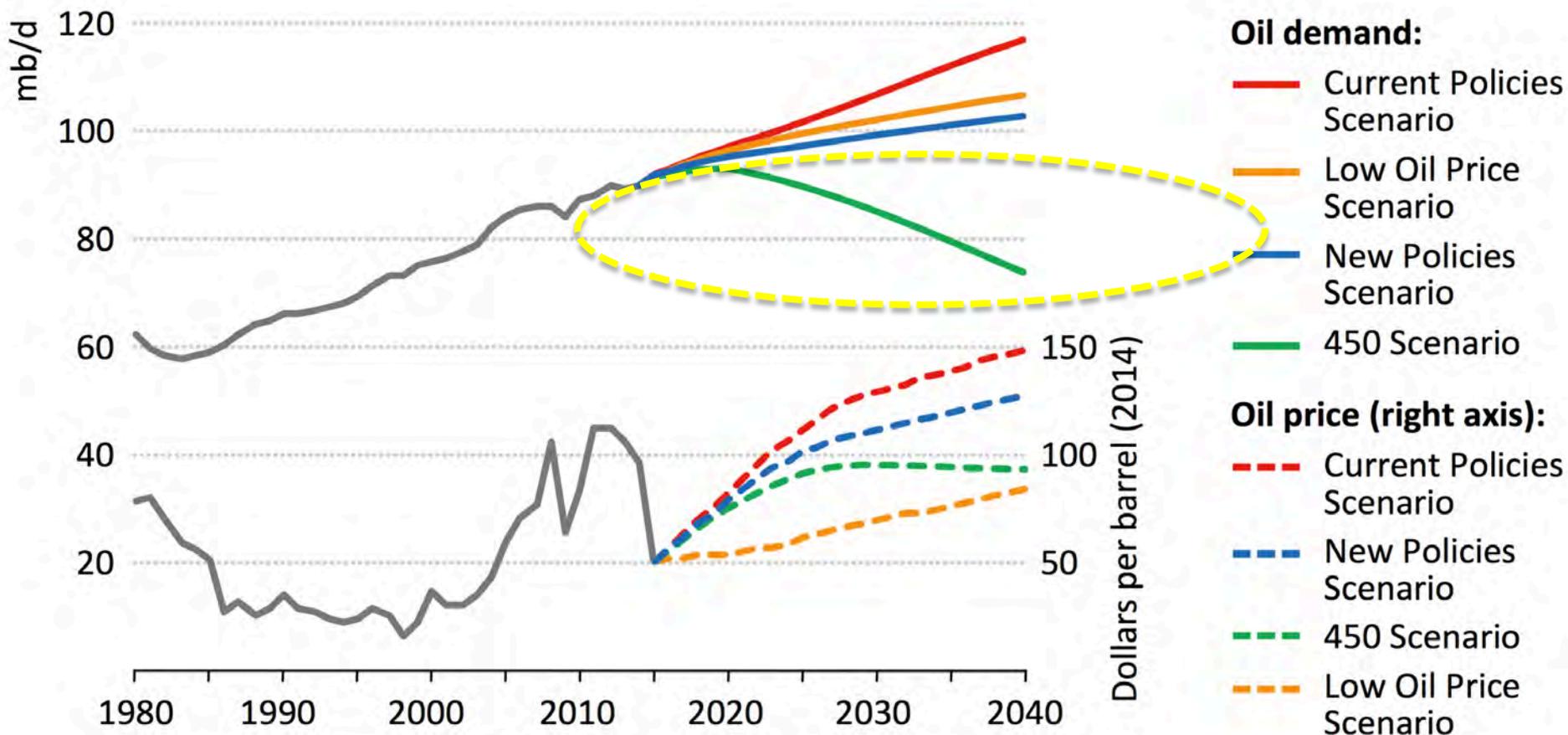


In only 2 decades, middle classes will represent close to 5 billion people

National mechanisms of carbon pricing



World oil demand depending on CO₂ mitigation efforts



INDC contributions and the emissions gap

