

Energy Transition Dialogue, 17.3.2016

Introduction into the international discussion of regulated and liberalized markets

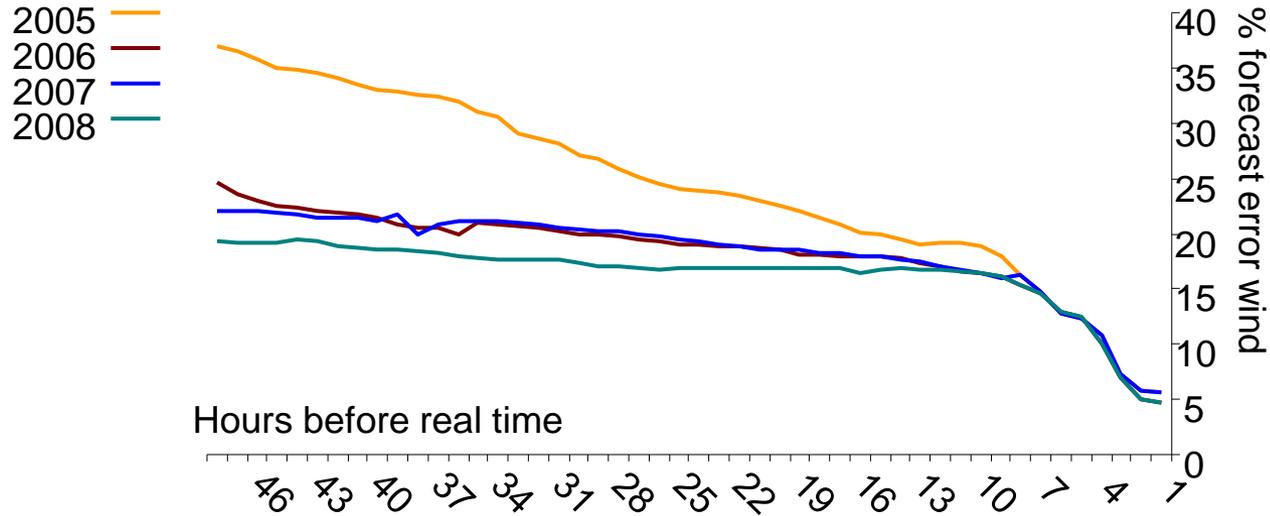
Professor Karsten Neuhoff

German Institute for Economic Research (DIW Berlin)

Introduction into the international discussion of regulated and liberalized markets

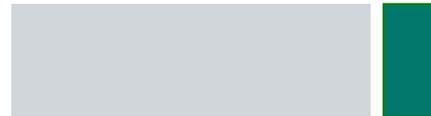
1. Short-term operation: Market place for all creates synergies and security
2. For investment: Consider two types of generation technologies
3. For non-dispatchable renewables focus on investment framework
4. In principle different options can secure supply – but at a cost

Short-term market design open for all technologies: Time frame and platform



Wind & solar

Can & need to adjust close to real time



Ensure deep intraday and real-time markets

Coal & most gas

Require early start-up

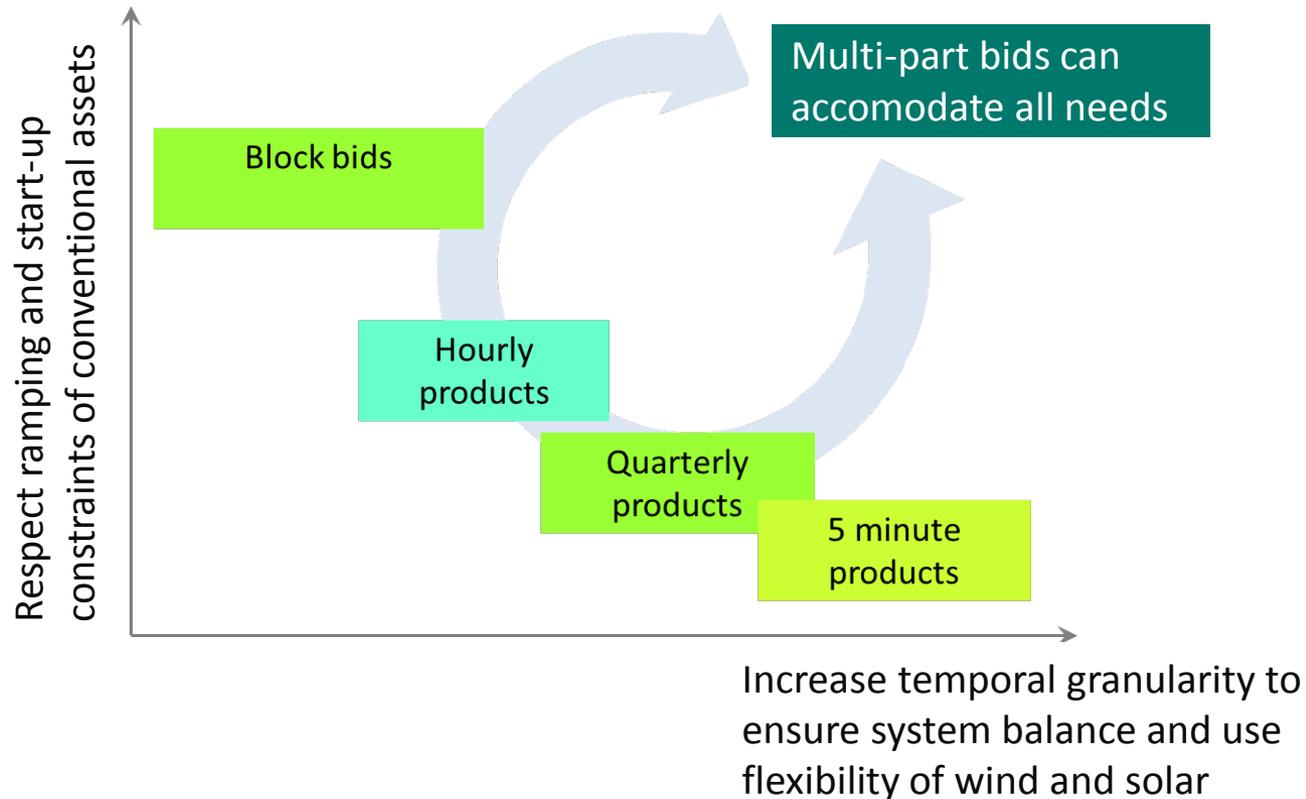


and consistent day-ahead markets



Clearing platforms or auctions are increasingly used in US and Europe for short-term power markets.

Short-term market design open for all technologies: Bid format

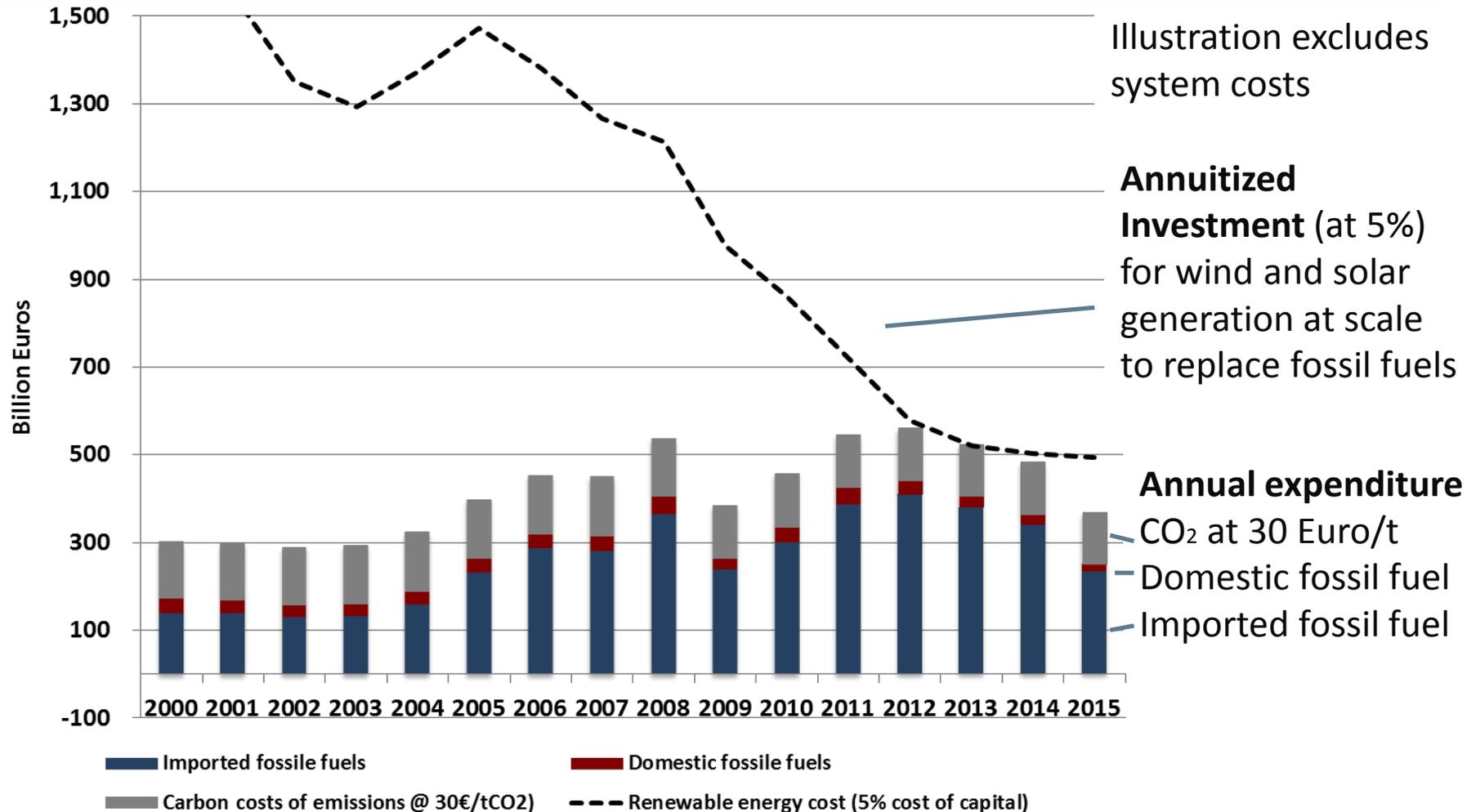


Further dimensions that good market design needs to ensure:

- Effective use of transmission capacity
- System-wide pooling of reserves

	Wind and solar PV	Fossil fuel based generation ... and flexibility options ...
Capital costs	~ 80%	~ 30%
Main strategic choices	New investment decision Location and dimensioning	(Re-)investment and retrofit decision Closure Fuel contracting
Capacity for government to decide	High (homogenous technology, competition for entry)	Low (inhomogeneous assets, large incumbent players, information asymmetries)
Other aspects	RE trajectory required - For grid investment - Supply chain / planning	Government choices politically contentious
Strategic choices	Policy-driven deployment	Private sector determined (financed on-balance sheet)

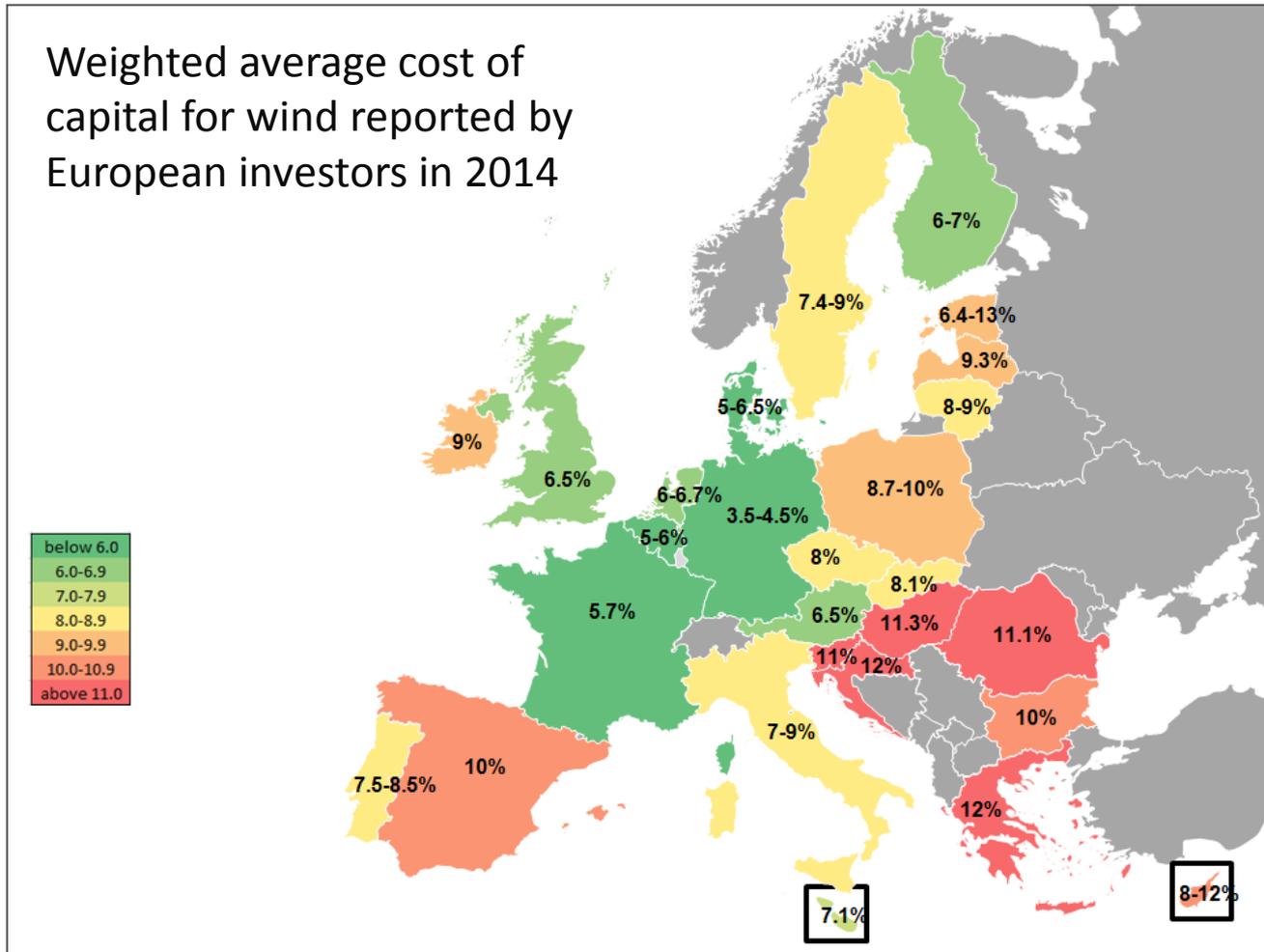
Make use of renewables to stabilize energy costs

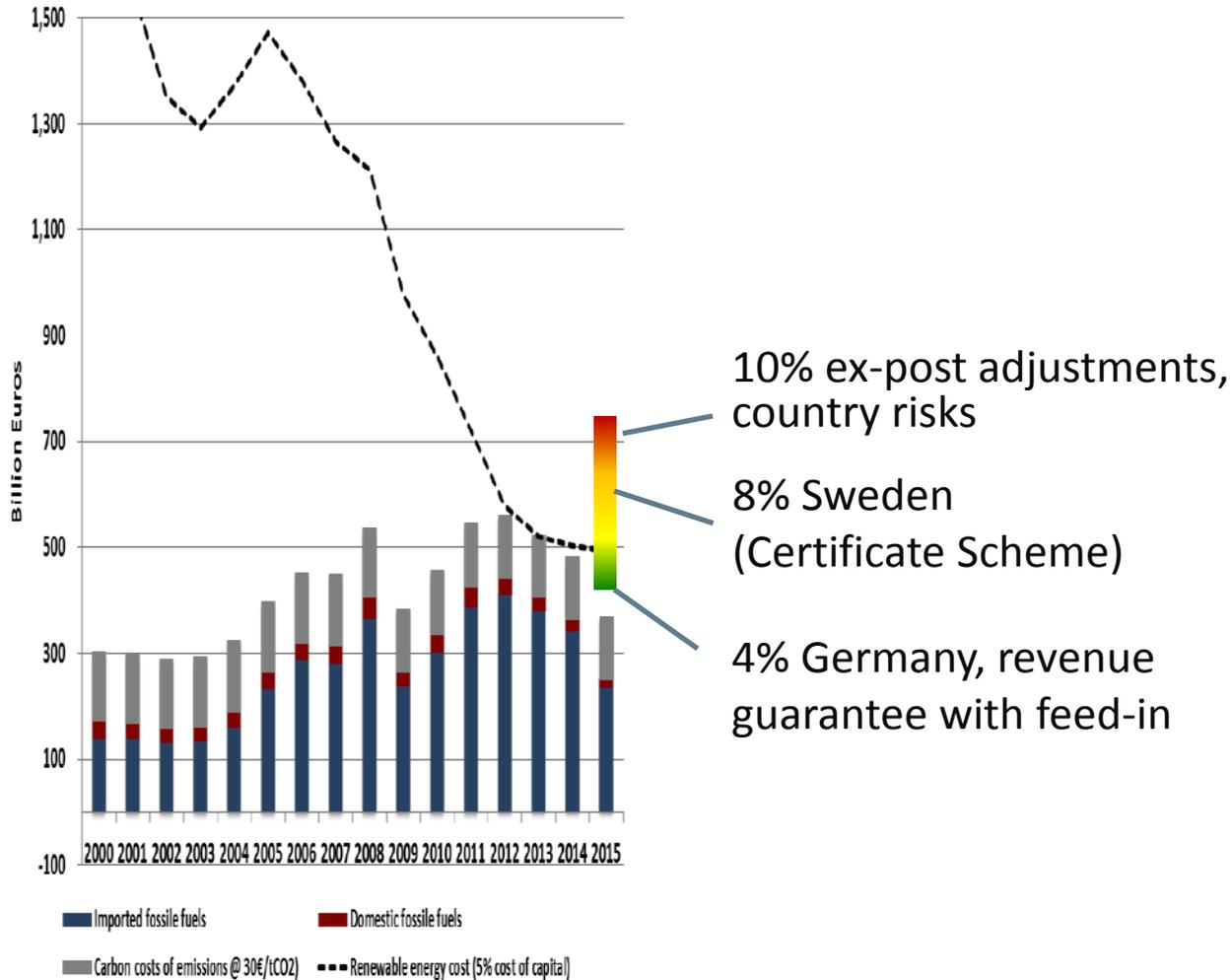


Similar cost level for serving demand with new wind and solar as with fossil fuel:

- *Cost of learning investment in wind and solar dominates debate but is sunk.*

Financing costs increase with (i) country situation (ii) policy design not addressing market imperfection and policy risk





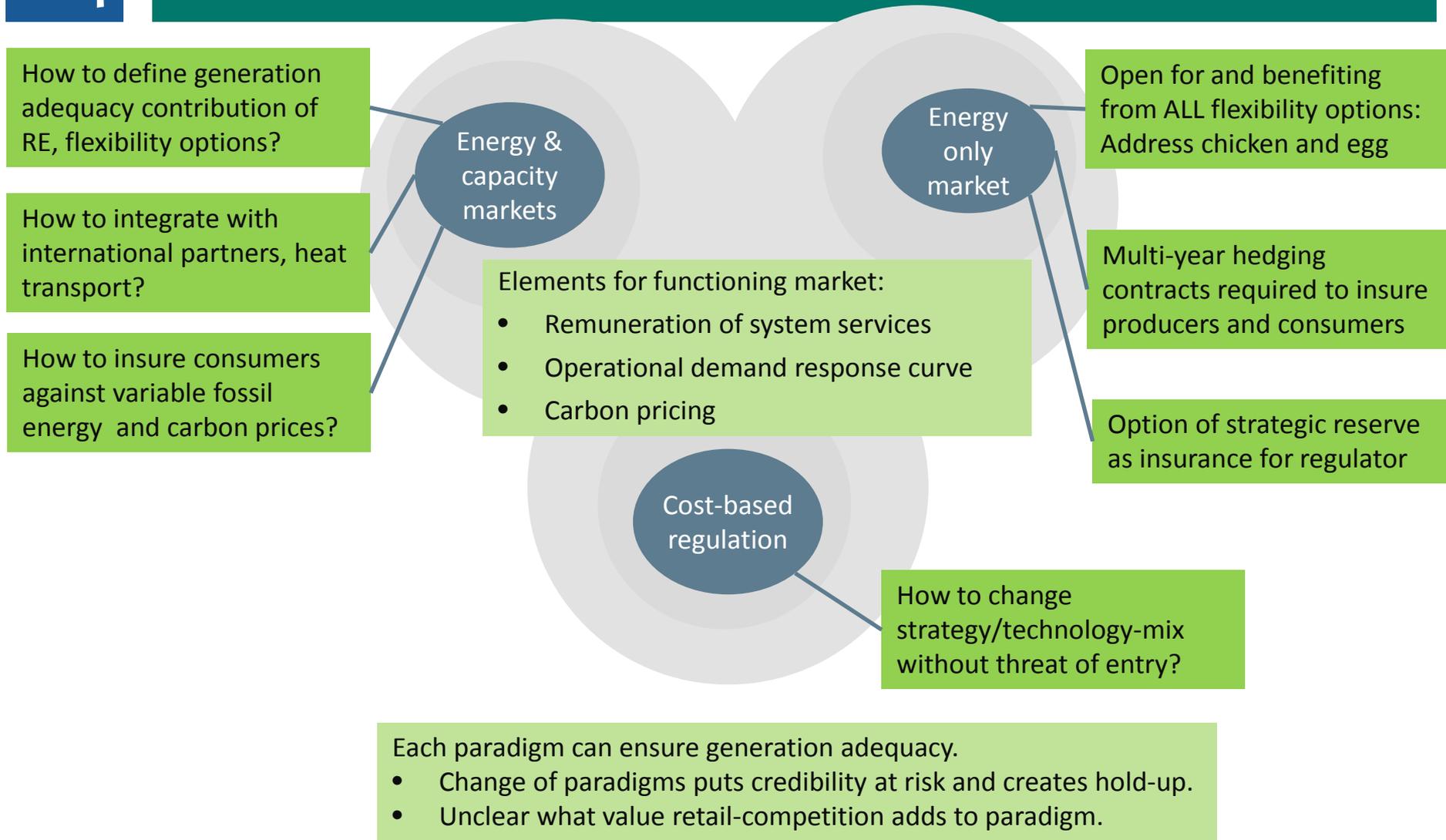
1. Cooperation can reduce financing cost for countries.

2. Policy can reduce financing cost for wind and solar by ensuring long-term stable revenue streams.

*3. RE benefit from hedge at times of low power prices:
Ensure consumers also benefit at times of high power prices.*

4

Three paradigms of investment for generation adequacy





**DIW Berlin — Deutsches Institut
für Wirtschaftsforschung e.V.**
Mohrenstraße 58, 10117 Berlin
www.diw.de

Karsten Neuhoff

kneuhoff@diw.de
