

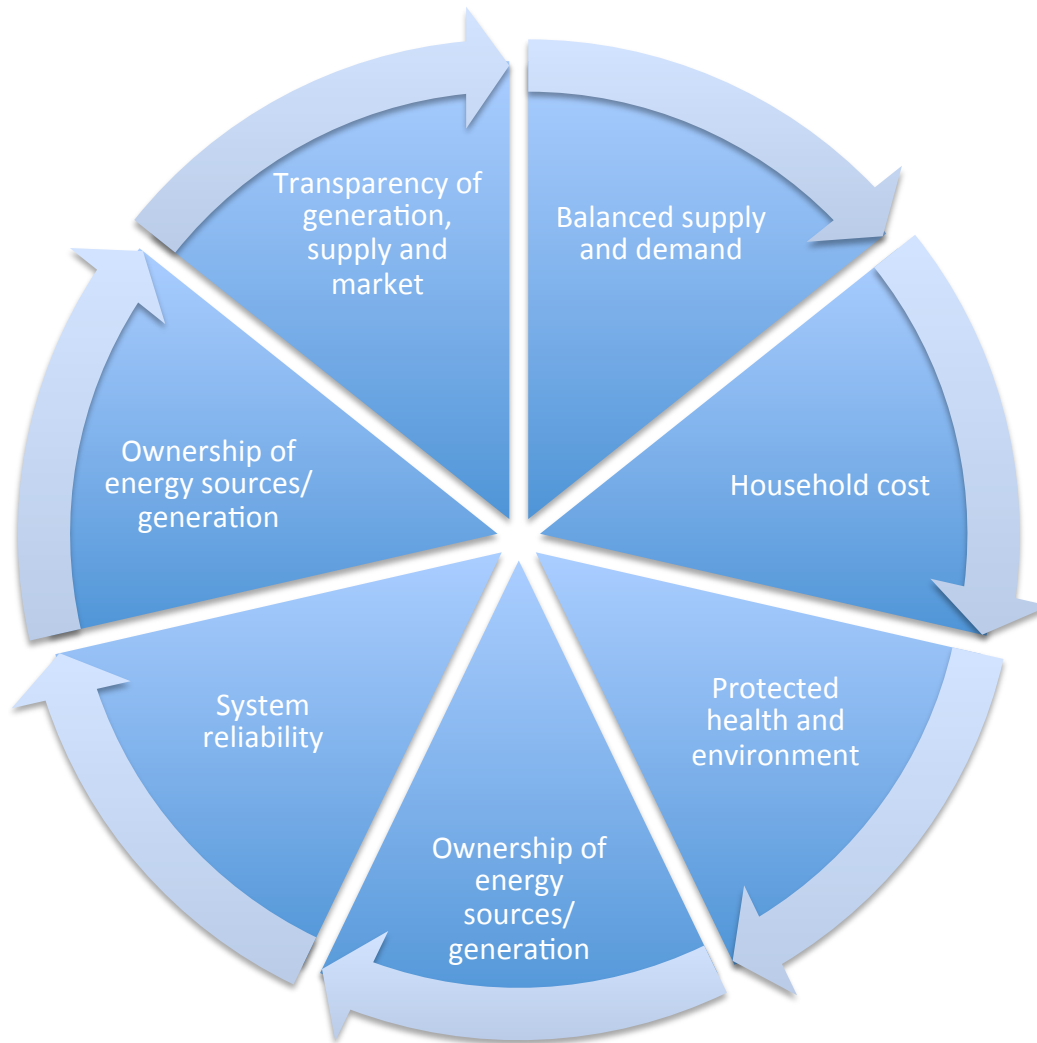
The Balkans' energy security resource

A business case

Julian Popov

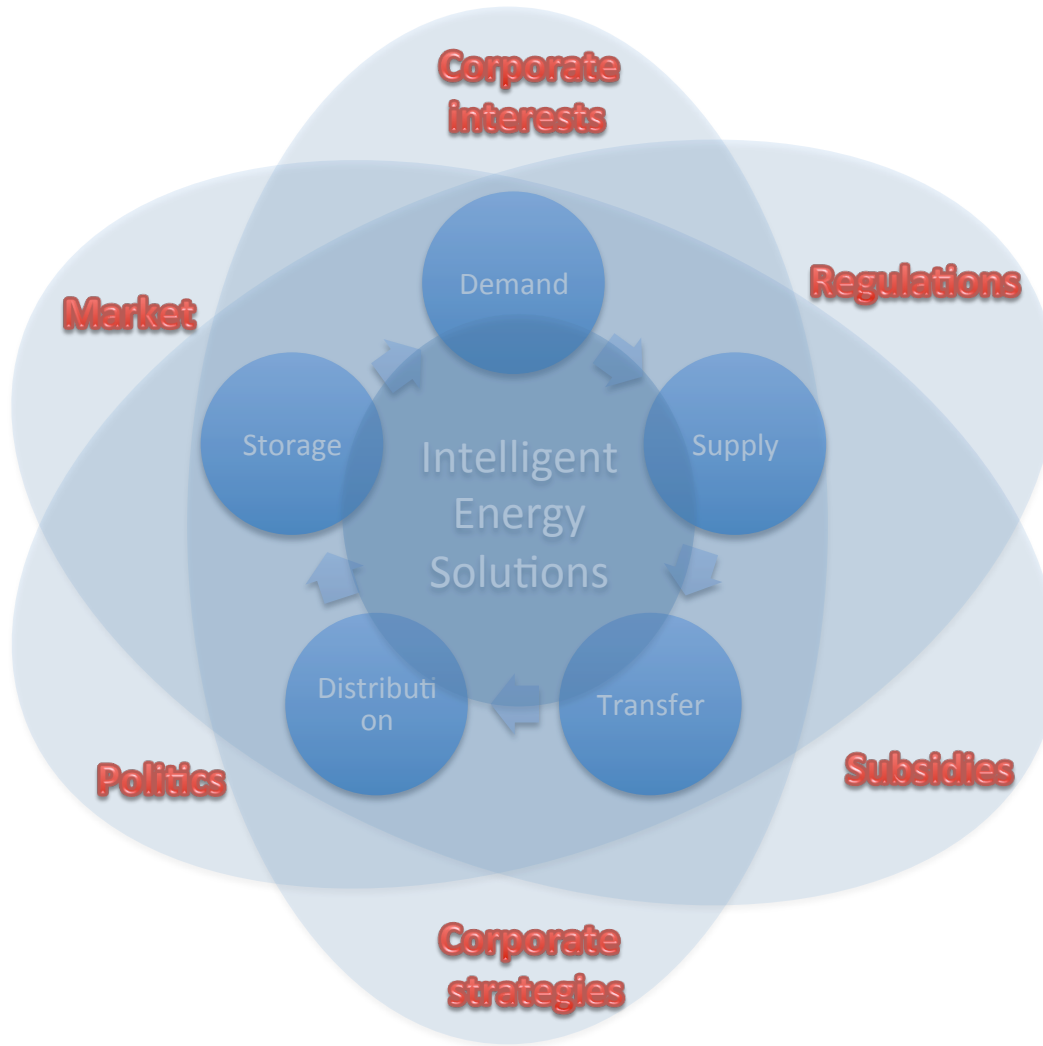
February 2013

Energy security is defined by at least 7 factors:



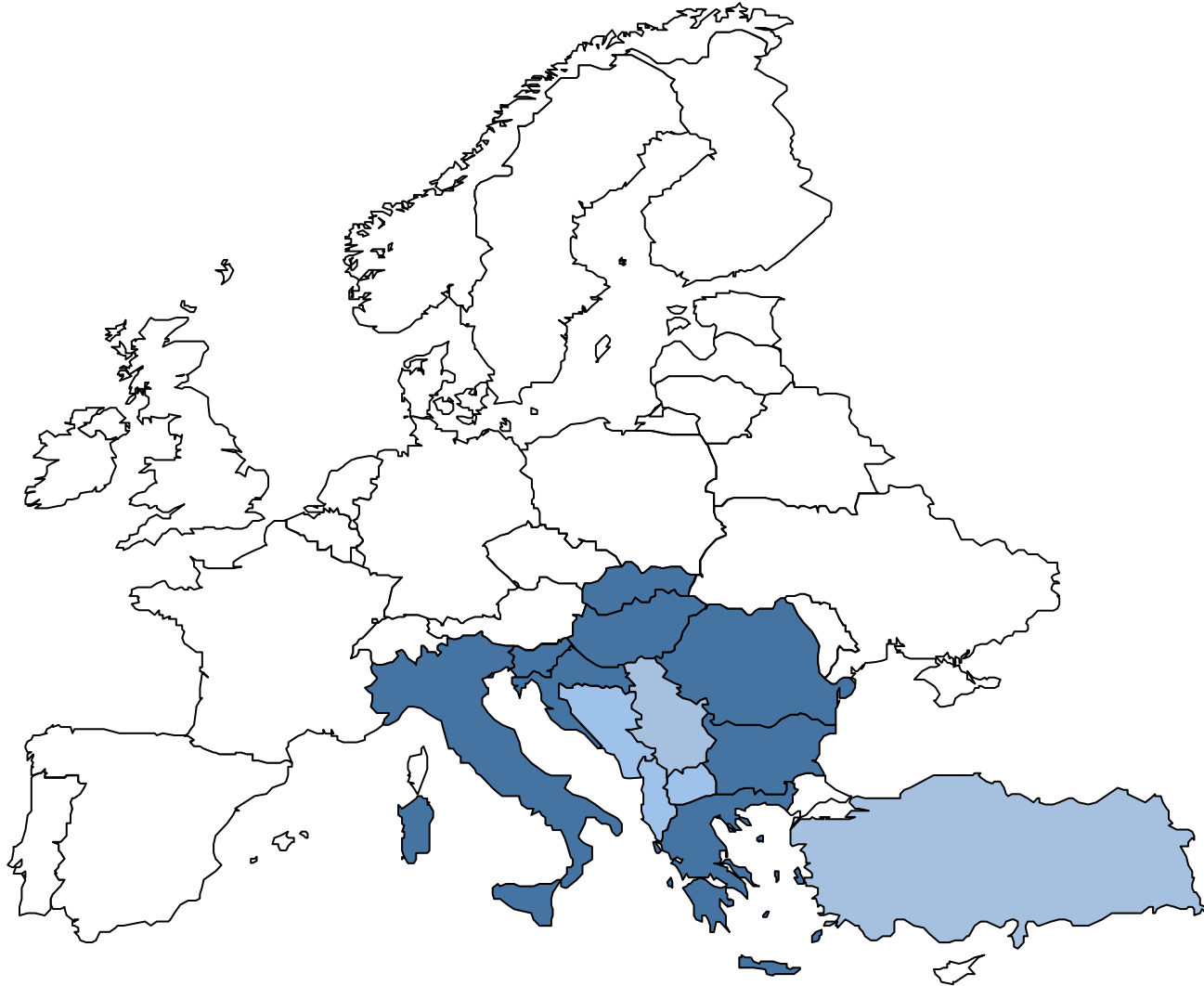
1. Supply and demand
2. System reliability
3. Household cost
4. Externalities
5. Ownership
6. Transparency
7. Regulation

The complexity of the energy sector, simplified



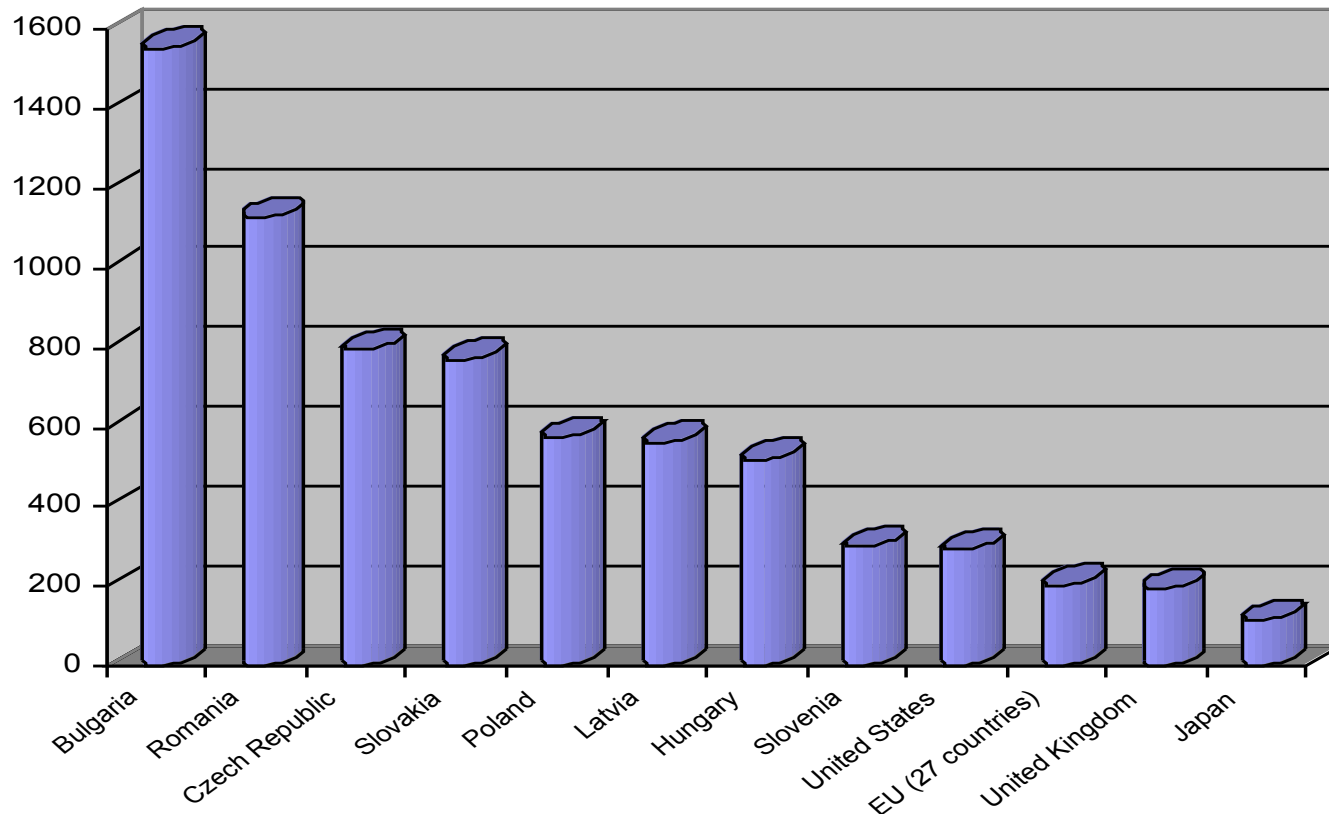
- Demand
- Efficiency
- Extraction
- Generation
- Transfer
- Distribution
- HVDC
- Storage
- Smart solutions

South East Europe



Demand

The low energy efficiency is the biggest energy resource of the Balkans



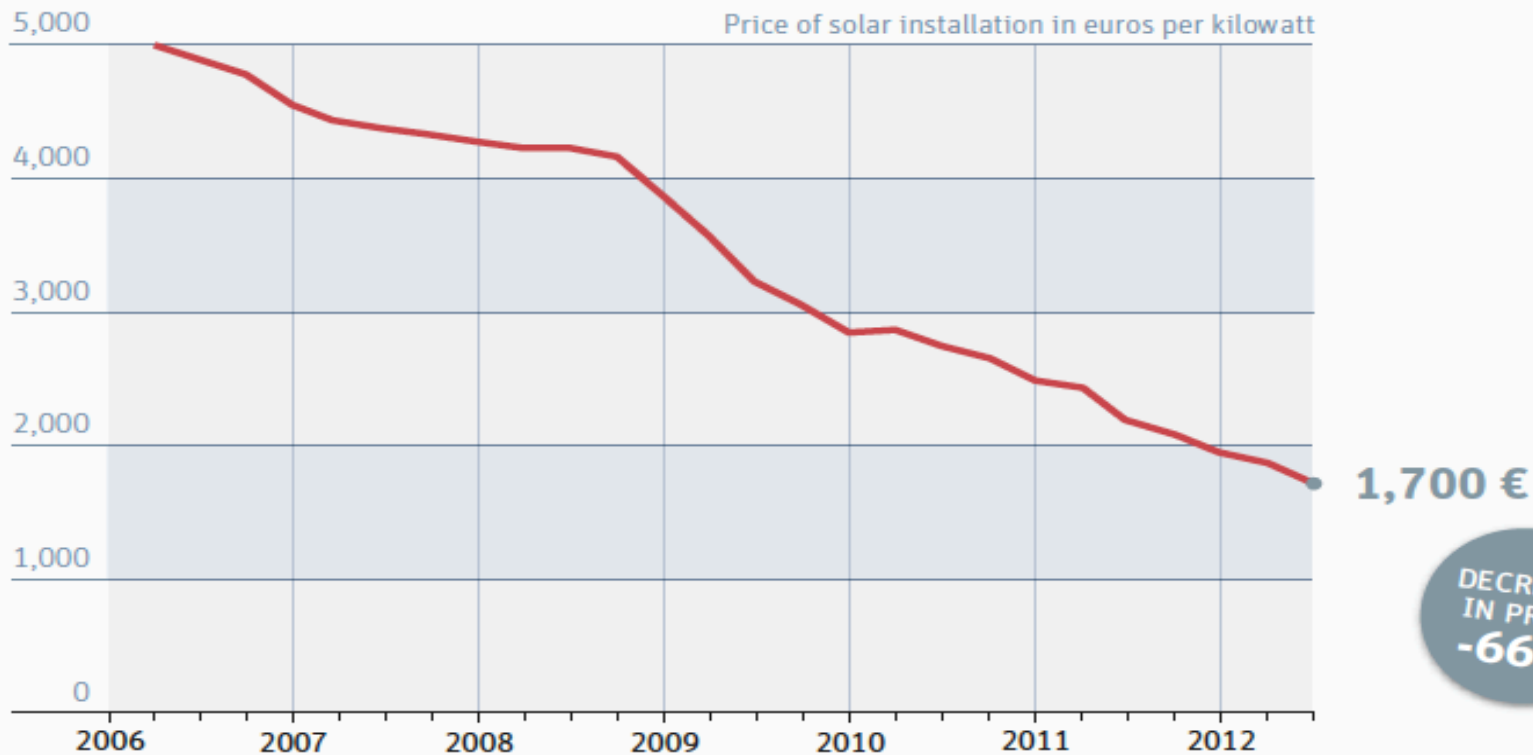
Energy intensity of the economy - gross inland consumption of energy divided by GDP
(kilogram of oil equivalent per 1000 Euro)

The solar case – cost decline in Germany

Installed solar system prices have plummeted by 66% since 2006

Average end-customer system prices for installed rooftop solar of up to 100 kilowatts-peak

Source: EUPD Research and BSW-Solar

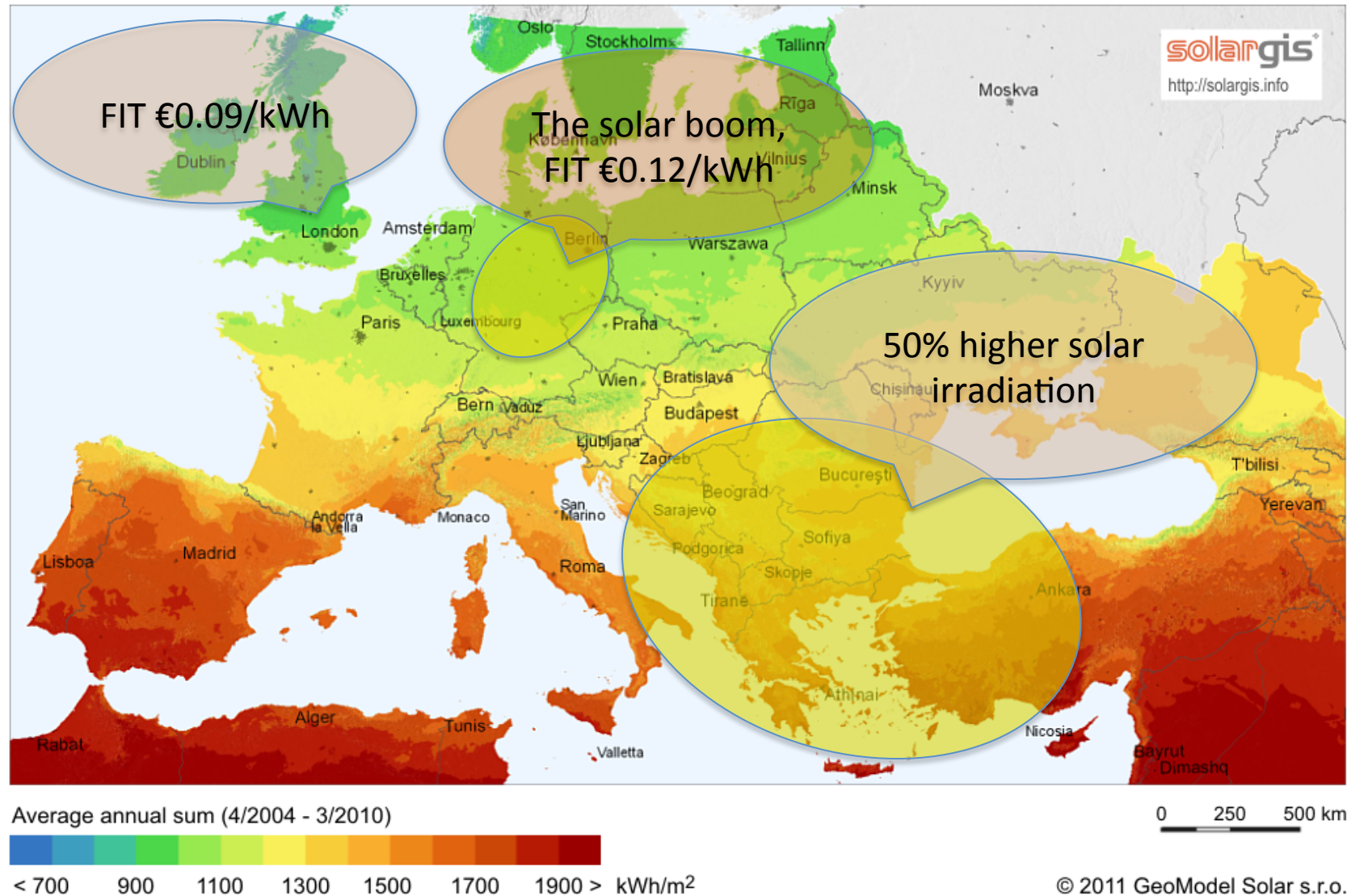


The solar case – North vs South

Germany is the largest European producer of renewable energy but
South East Europe has 40-60% higher solar capacity

Global horizontal irradiation

Europe



Solar is cheap

The lowest solar FIT in UK and Germany:

Germany - €0.12

UK - €0.9

€1m – MW installed capacity (Romania)

Domestic price of electricity:

Bulgaria - €0.9 kwh

Romania - €0.11 kwh

Greece - €0.13 kwh

Turkey - €0.12 kwh

Solar Irradiation:

Germany: 900-1100 kwh/y/m²

Bulgaria: 1300-1500 kwh/y/m²

Romania: 1100 -1500 kwh/y/m²

Turkey: 1500-1900 kwh/m²

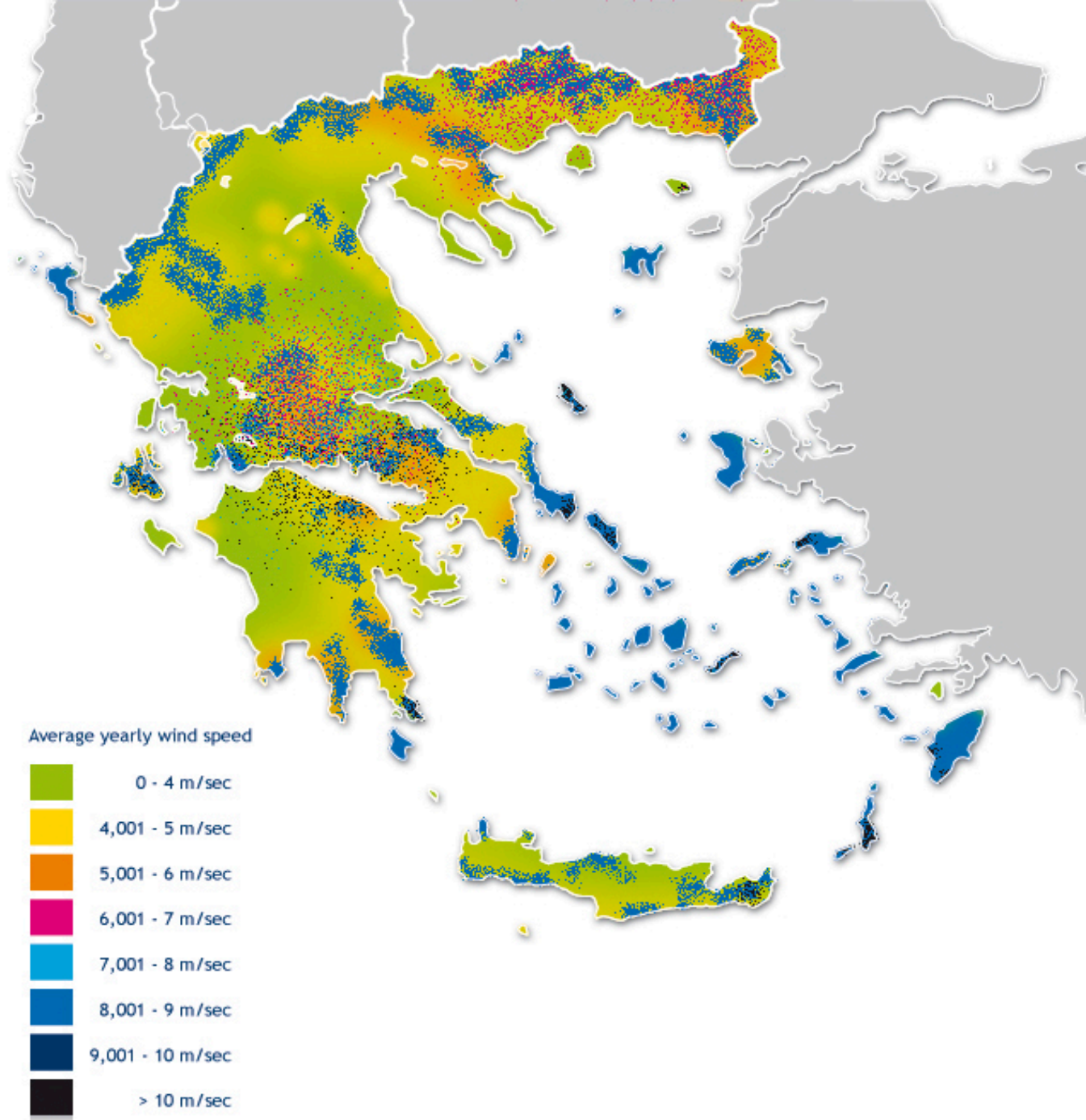
SEE should be able to sustain feed in tariffs (or another form of fixed price) for solar electricity that are already below the consumer price of electricity.

Cost of capital, transparency and predictability remain a problem.

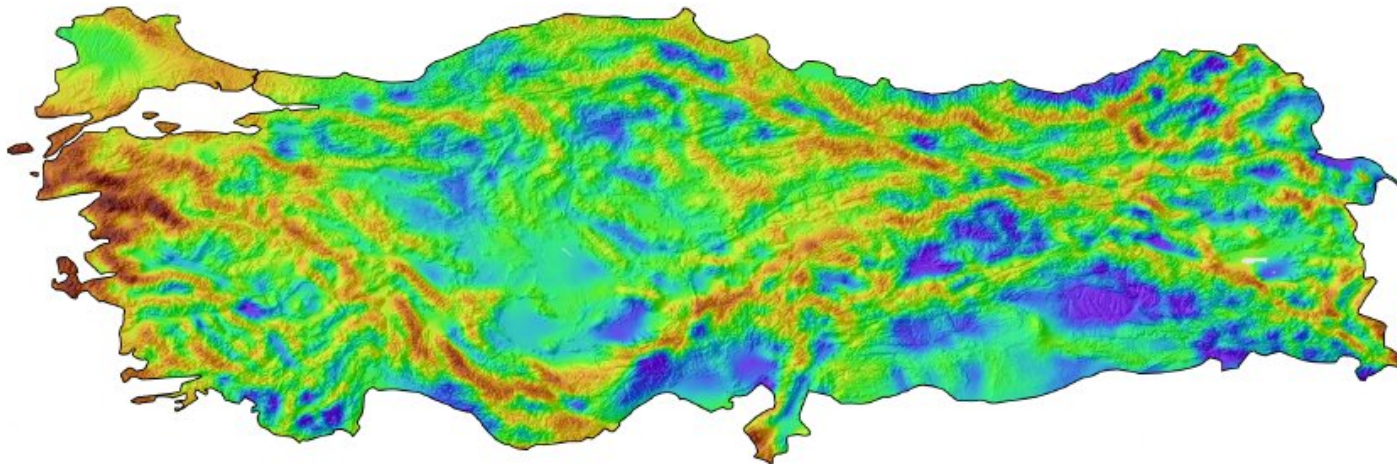
We need new grid concept.

The current market structure also need to be changed.

Wind map Greece



Turkey Wind Map at 80m



5km Wind Map at 80m

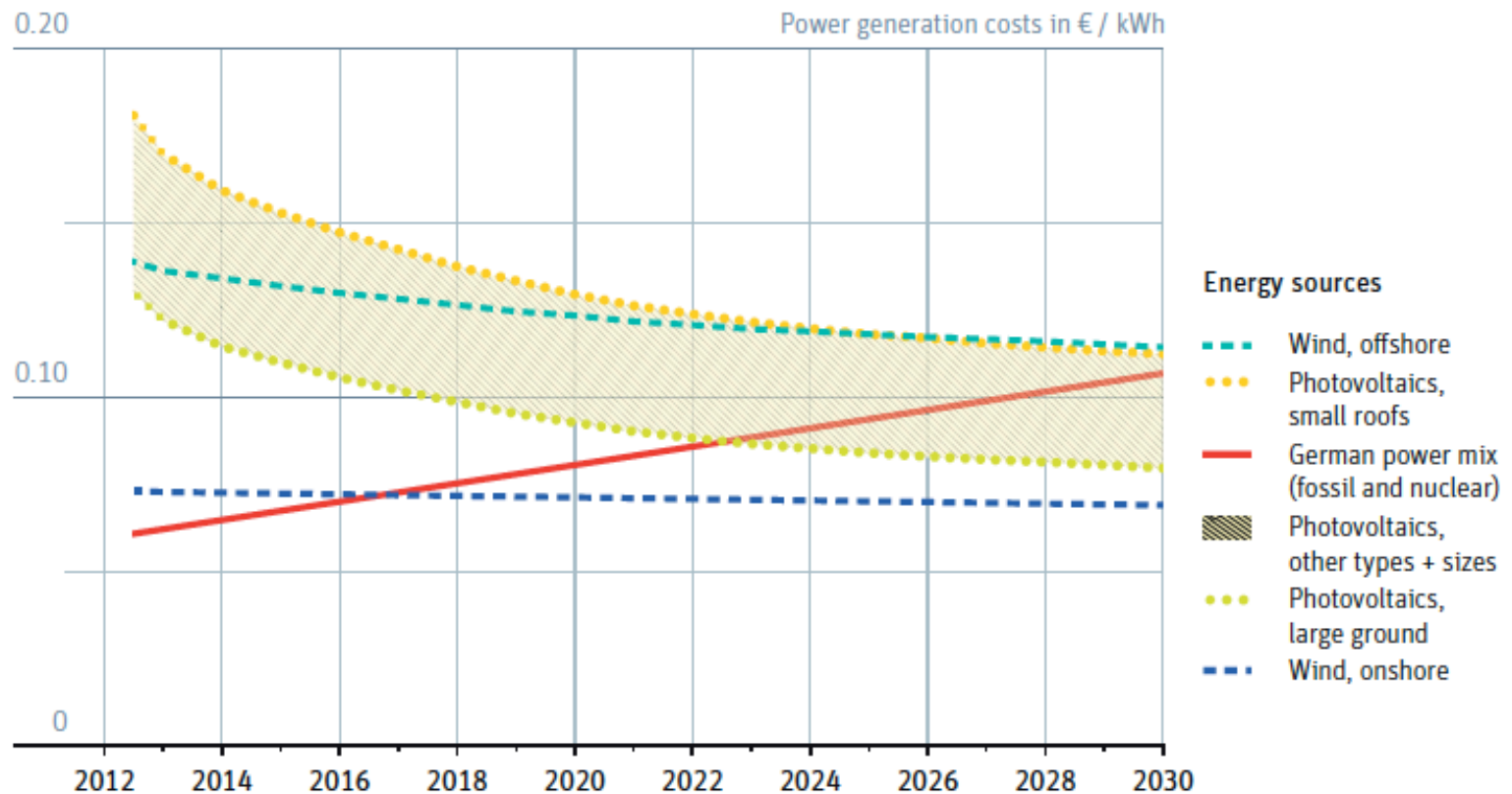
Wind speed



3 6 9 m/s

Grid parity of RES in Germany (excluding externalities)

Source: Fraunhofer ISE



Hydroelectricity in SE Europe as % of total

(source KPMG, 2010; Eurelectric, 2012))

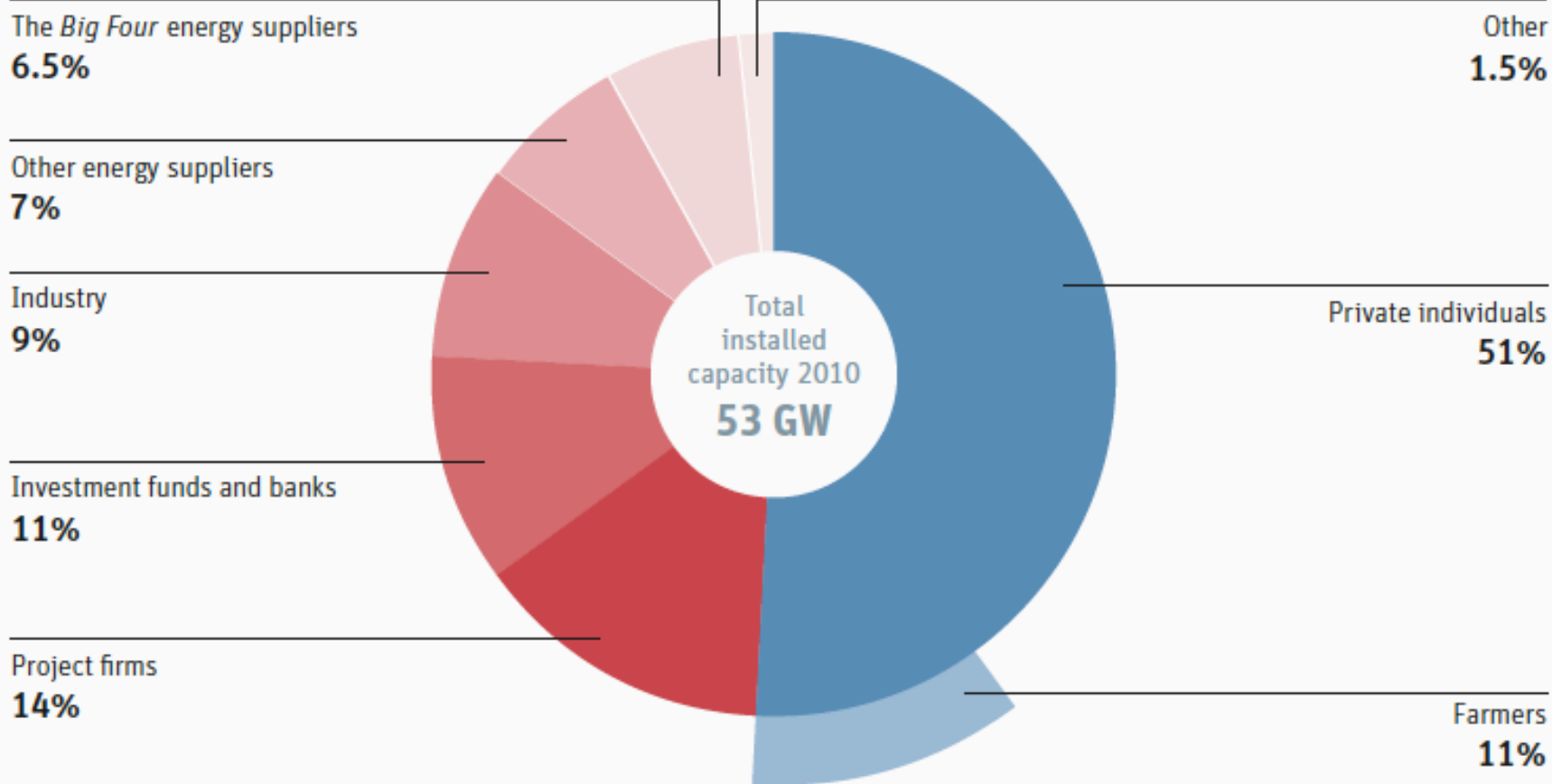
	Total installed capacity	Total generated electricity
Albania	87%	97%
Bosnia and Herzegovina	51%	34%
Bulgaria	26%	9%
Croatia	53%	46%
Greece	18%	7.7%
Kosovo	3%	2%
Macedonia	39%	15%
Montenegro	76%	57%
Romania	35%	28%
Serbia	34%	29%
Slovenia	30%	23%
Turkey	17%	23%

South-eastern Europe utilises just 40% of its hydropower potential (Deutsche Bank Research)

Renewables in the hands of the people

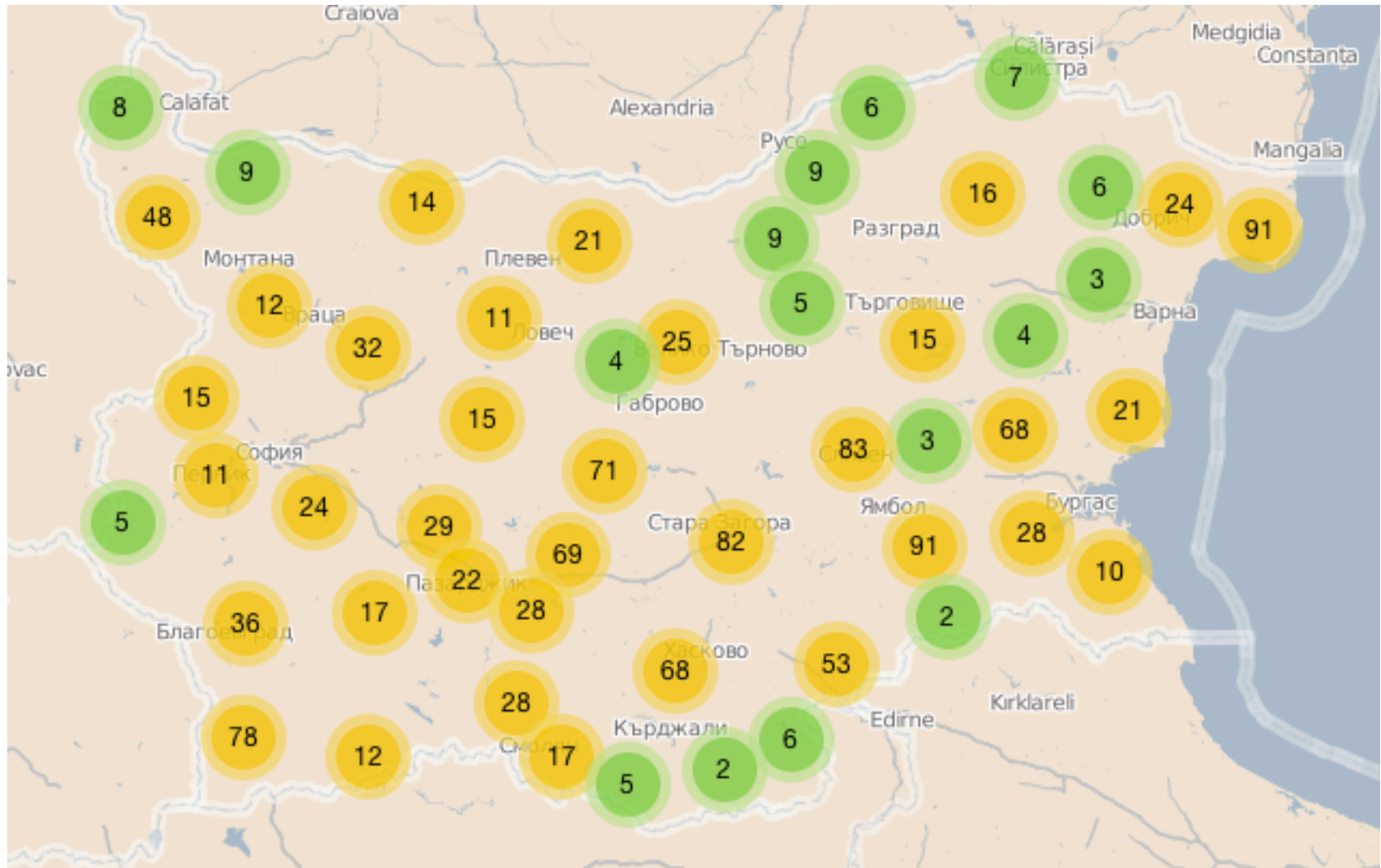
Ownership of renewables installed capacity in Germany, 2010

Source: www.unendlich-viel-energie.de



Grid and ownership transformation of the energy sector

Dynamic RES map of Bulgaria, B. Yurukov

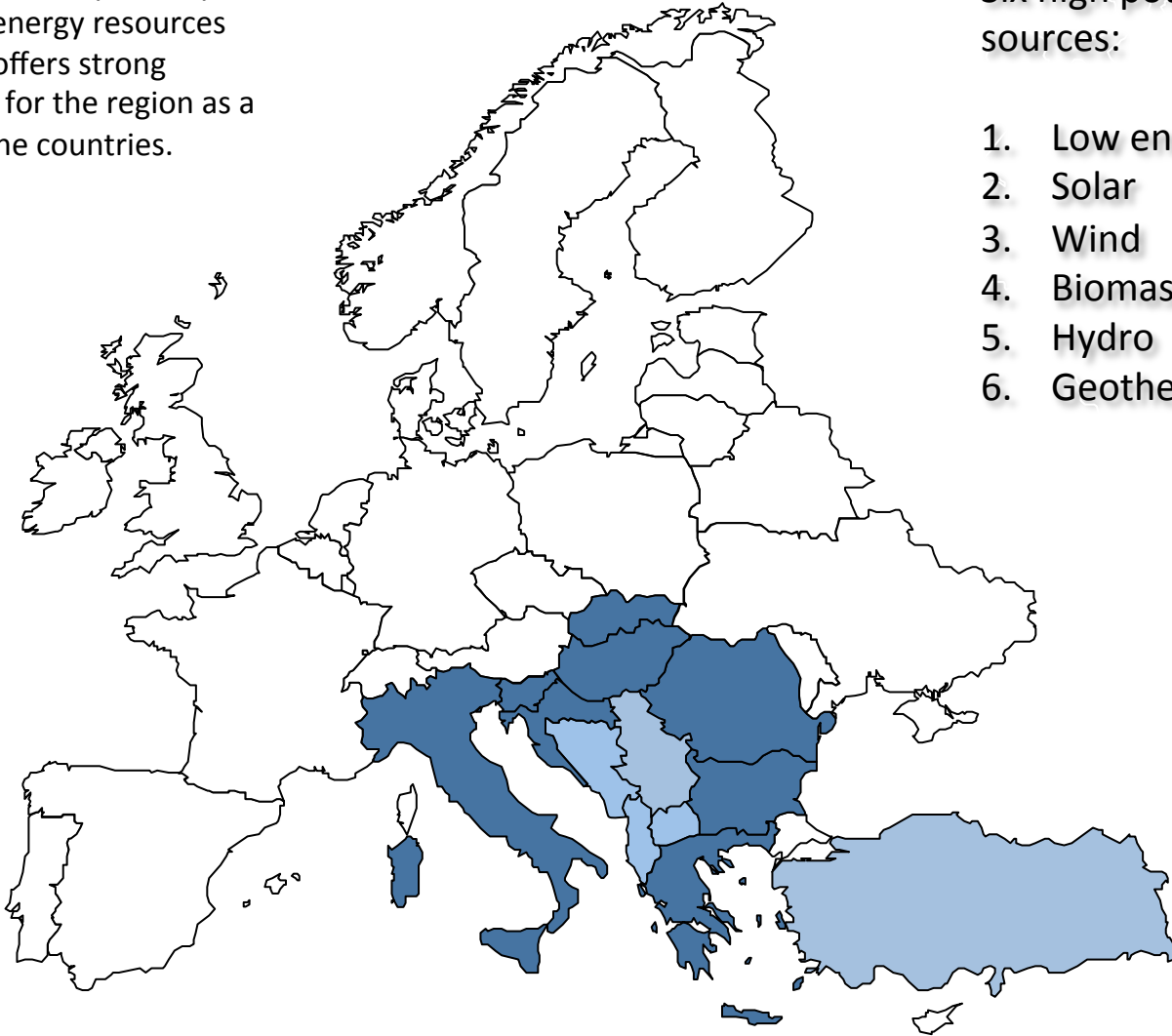


South East Europe is a key resource in the future European Energy Strategy

South East Europe is exceptionally rich in renewable energy resources and their balance offers strong economic benefits for the region as a whole and for all the countries.

Six high potential energy sources:

1. Low energy efficiency
2. Solar
3. Wind
4. Biomass
5. Hydro
6. Geothermal



The SEE RES revolution - anecdotal evidence

- Romania 20% of energy needs could be met by biomass
- Romania has almost reached its 2020 RES target
- Romania - €3bn invested in wind, expected solar boom
- Turkey 20GW wind by 2023
- Italy 11GW solar in 2011
- Austria – expected 85% RES-e by 2020
- Bulgaria – explosive expansion of RES
- Albania – almost 100% RES

The SEE RES energy mix

Energy source	Current state	Potential
1. Energy efficiency	Lowest in Europe	Very high
2. Solar	Limited, fragmented	50% higher than Germany
3. Wind	Growing	(83Gw in Turkey)
4. Biomass	Agricultural region	High
5. Hydro	Only 40% developed	75-100% of current demand
6. Geothermal	Very limited	Relatively high

What is missing?

And why we need to get over the energy nationalism?

The 3 missing links of the SEE energy security

- **Regionalisation of the Balkan energy strategy**

By connecting their national energy resources the SE countries will be able to balance the RES intermittency, use their energy storage potential and develop a market with significant size for strong investors.

- **Grids**

A regional strategy based on domestic resources will need a new generation of grid that combines capacity for high volume transfers, distributed energy model and ???

- **Europe's own energy strategy**

Currently the European Commission sees the Balkans simply as a gas corridor. If the SEE countries want energy security they should change this perception and the definitions in the EC strategic documents

CLIMATE PARLIAMENT EVENT

RENEWABLES IN TURKEY:

REFOCUSING EU-TURKEY ENERGY
COOPERATION



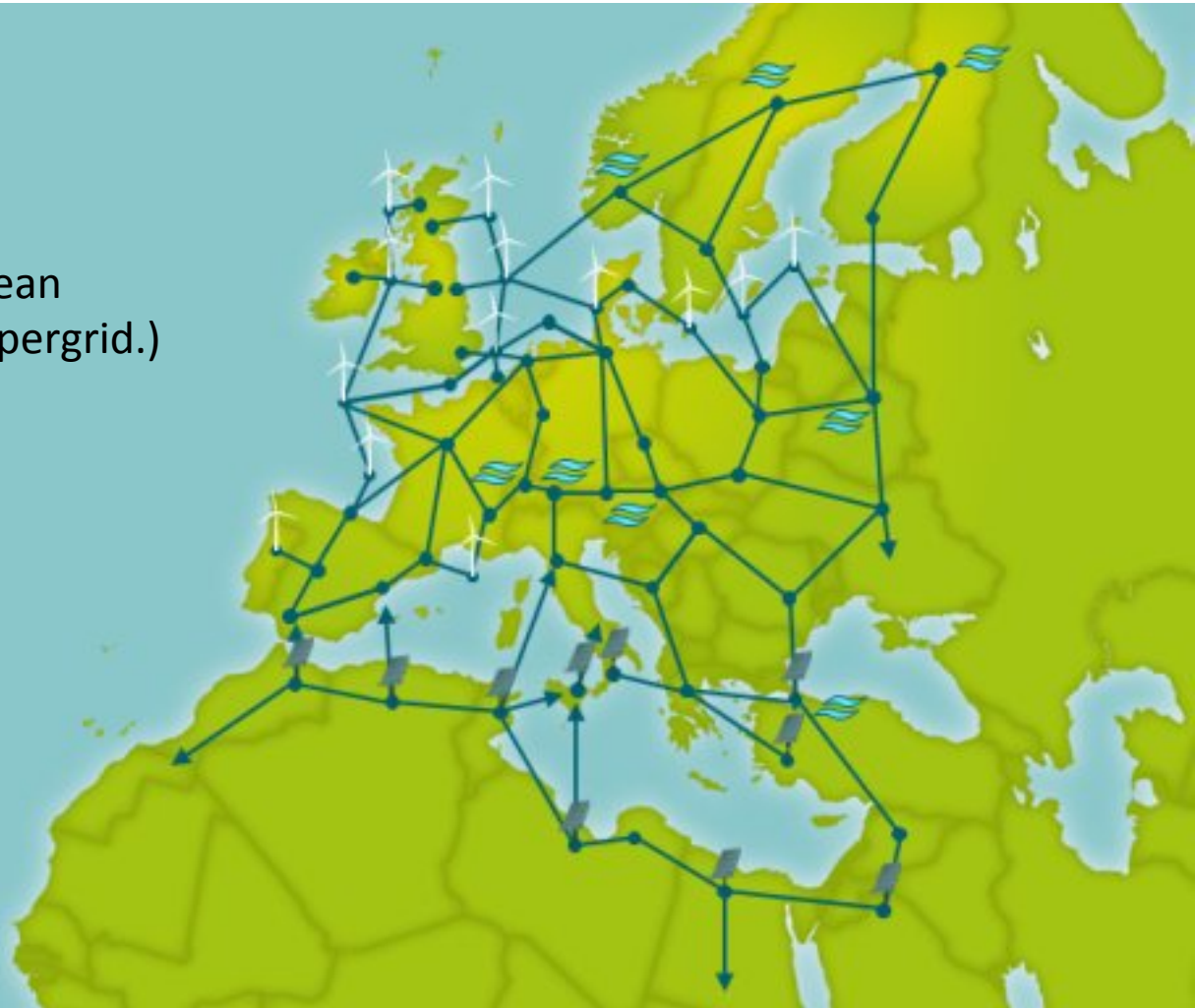
**Creating a green energy hub between Europe, the Middle East
and North Africa**

22nd January 2013 | 16:00 - 18:30

European Parliament, Room ASP 1G2

60, Rue Wiertz, B-1047 Brussels

A concept map of the European
supergrid. (Friends of the Supergrid.)



The European Commission sees the Balkans only as a gas corridor

European energy infrastructure priorities
for electricity, gas and oil



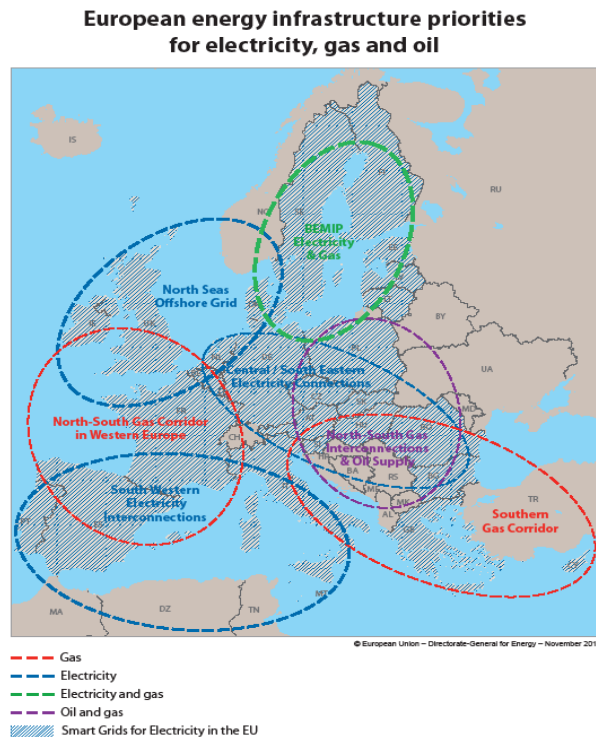
© European Union – Directorate-General for Energy – November 2010

- Gas
- Electricity
- Electricity and gas
- Oil and gas
- Smart Grids for Electricity in the EU

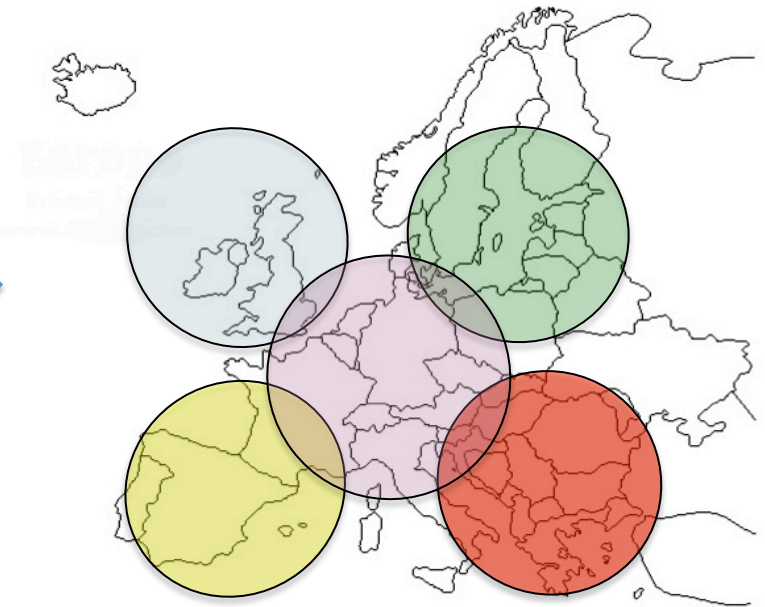
Changing the European energy infrastructure map

Background: Currently the EC designates South East Europe as a gas corridor only. This position promotes carbon intensive industries and infrastructure in the SEE and ignores the significant RES potential of the whole region (incl Turkey).

The (current) wrong EU energy infrastructure map



The right kind of map (regional supergrids)



The Balkans' energy security resource

A business case

Thank you!

Julian Popov

February 2013

jpopov@clara.net