

# IEM: Electricity Market

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# From liberalization to harmonization of the regulation and integration of the markets

- Harmonisation of the rules on wholesale markets (detecting of market abuse, prohibiting of using of insider information or the spreading of incorrect information).
- Regulation of who can use cross-border infrastructure and under what conditions.
- Access to infrastructure (exemptions from TPA to implement risky investments which cannot be made otherwise).
- Rules on government intervention (state aid for RES, backup capacity...).
- Consumer rights and protection.

# Market unification

- Target model – agreed blueprint for the architecture of both electricity and gas market. To harmonize cross-border trading arrangements and link national markets through efficient use of infrastructure carrying electricity.
- Network Codes (Capacity Allocation and Congestion Management and others) and Framework Guidelines.

# Independent regulators

- Independent both from industry and govt's interests. Own legal entities, have their own budget.
- Can issue binding decisions to companies and impose penalties on those that do not comply with their legal obligation.
- Generators, network operators and suppliers have to provide them with accurate data.
- Are required to cooperate with each other (ACER, ENTSO-E, ENTSO-G).

# ACER

- Drafting guidelines for the operation of cross-border gas pipelines and electricity networks.
- Reviewing the implementation of EU-wide network development plans.
- Deciding on cross-border issues if NRAs cannot agree or if they ask it to intervene.
- Monitoring the functioning of the IEM including retail prices, network access for electricity produced from RES, and consumers rights.

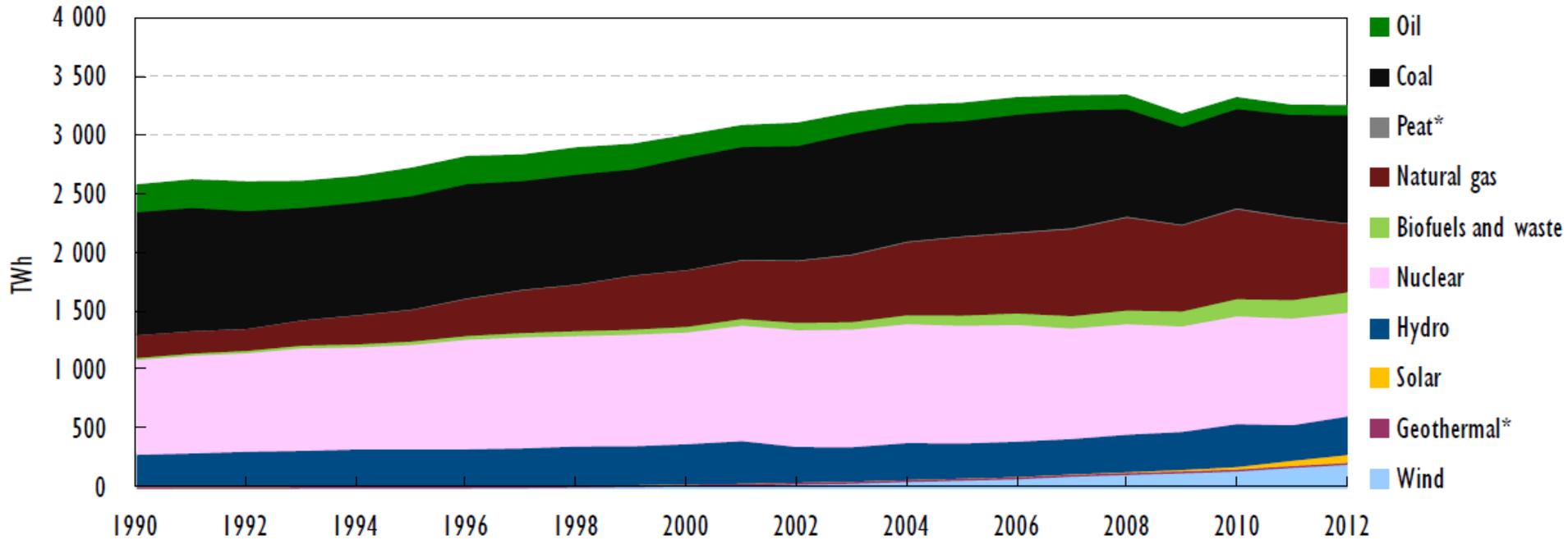
# ENTSO-E + ENTSO-G

- Developing of standards and draft network codes to help harmonise the flow of electricity and gas across different transmission systems.
- Coordinating of the planning of new network investments and monitor the development of new transmission capabilities. Europe-wide 10 year investment plan to help identify gas every two years.

## Key data (2012)

- Installed capacity – 952 GW.
- Total electricity generation 3264 TWh (+5% since 2002).
- Electricity generation mix: coal 28,4%, nuclear 27%, natural gas 17,8%, hydro 10,3%, wind 6,3%, biofuels and waste 5,2%, oil 2,2%, solar 2,2%, peat 0,2%, geothermal 0,2%.
- Electricity consumption by sector: industry 36%, commercial 32,1%, residential 29,6%, transport 2,3%.

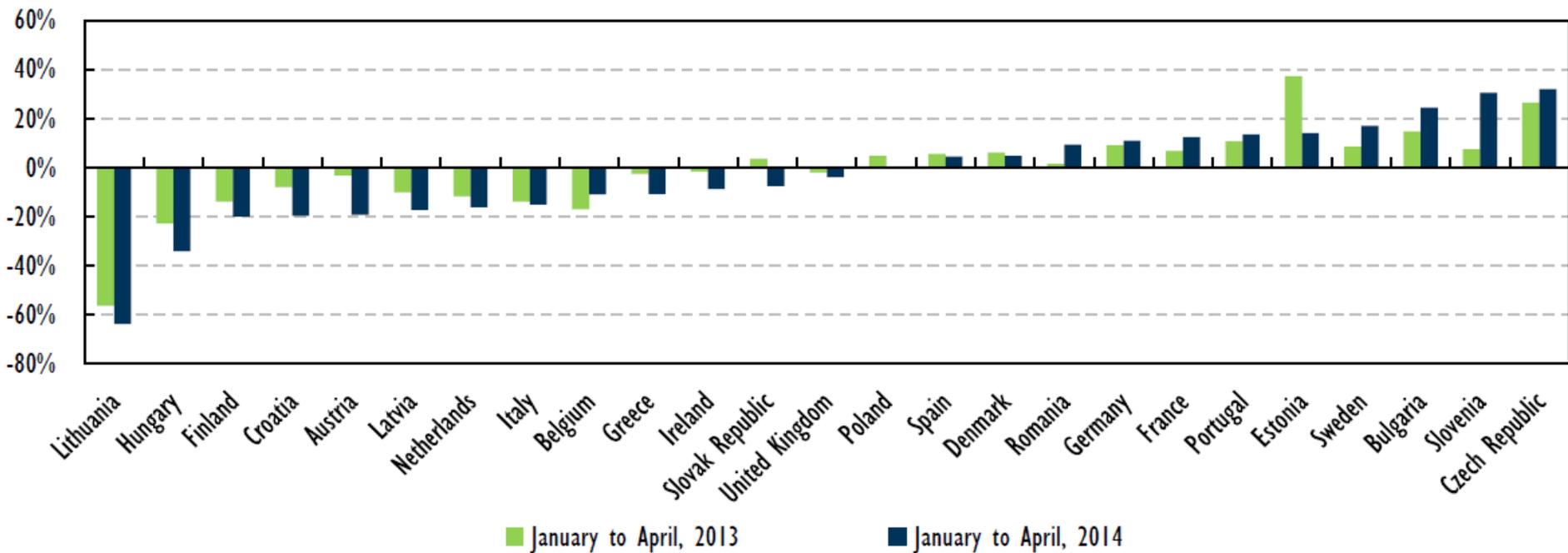
## Electricity generation by source, 1990-2012



\* Negligible.

Sources: IEA (2014a), *Energy Balances of OECD Countries*, OECD/IEA, Paris; IEA (2014c), *Energy Statistics of Non-OECD Countries*, OECD/IEA, Paris.

## Intra-EU power import and export positions, 2013 and 2014



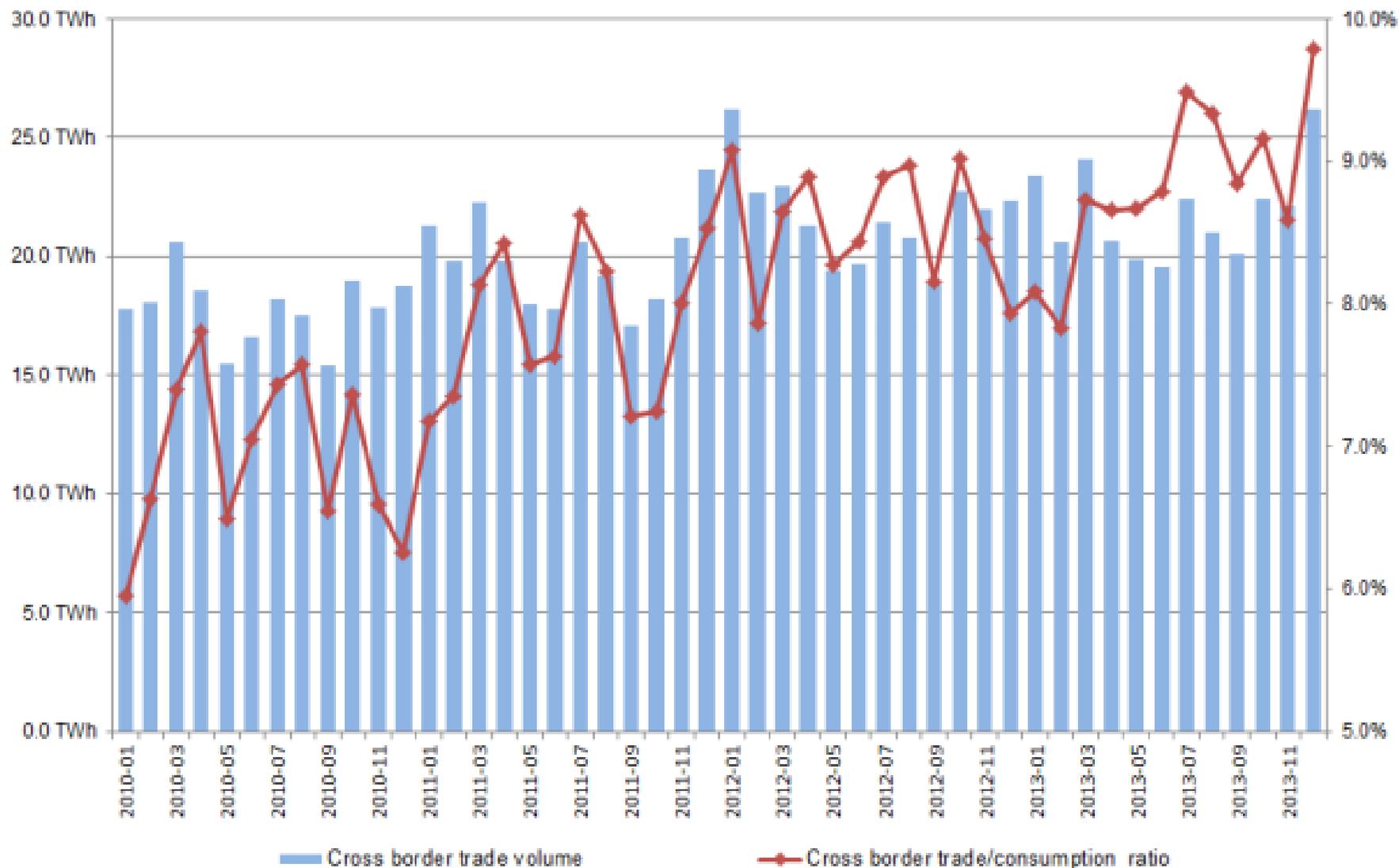
Notes: data represents the difference between power generation and consumption. Data for Cyprus, Malta and Luxembourg are not included.

Source: ENTSO-E, European Commission, 2014.

# Wholesale electricity market

- Cross-border trade has been growing, in 2011 around 10% of gross production.
- Germany surplus of 22,8 TWh, France exported 44 TWh (both in 2012), increasing trade activity in Norway, Sweden, Austria, Switzerland (hydroelectric capacities).

## Monthly cross border electricity flows in the EU and the ratio of cross border flows compared to the gross inland electricity consumption

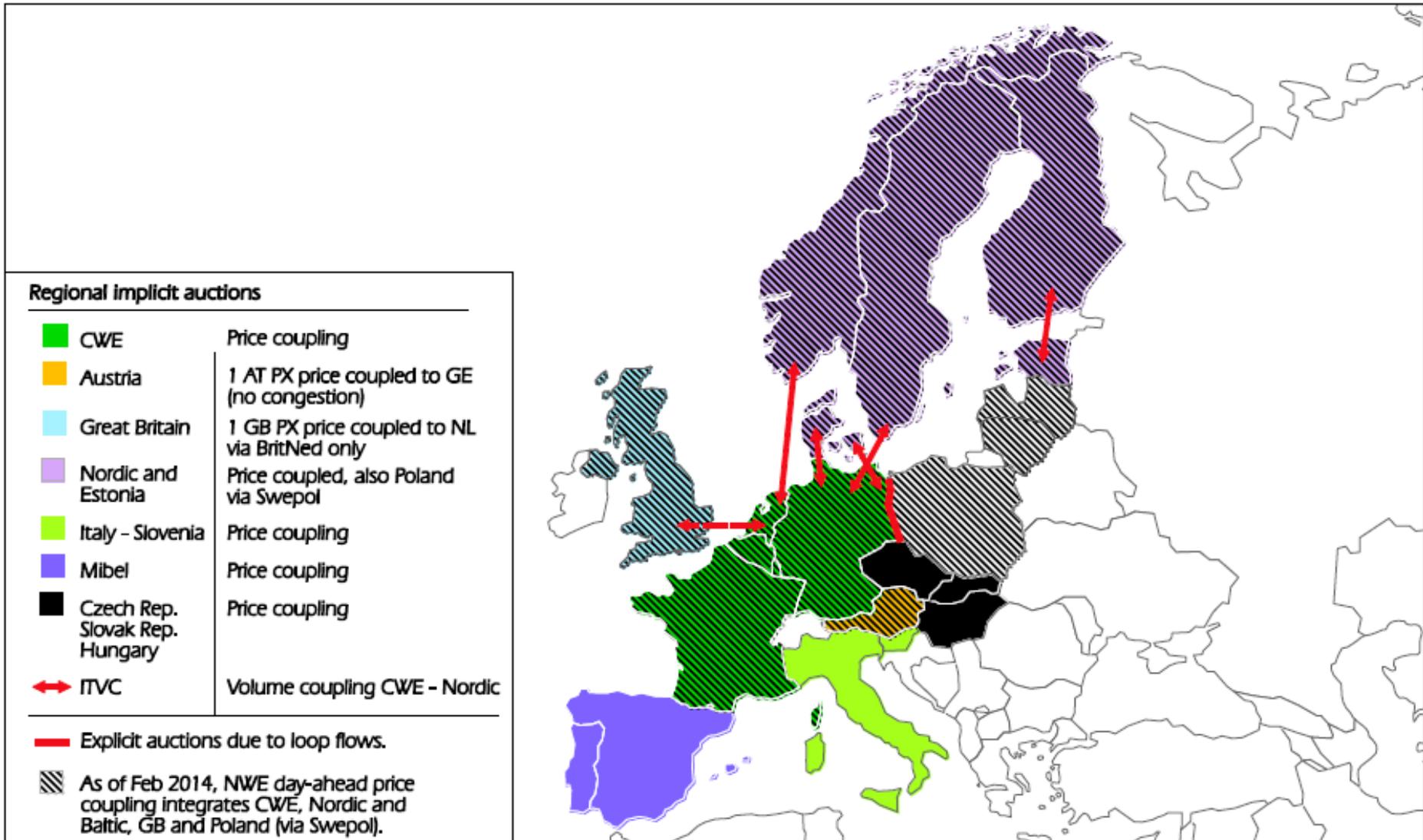


Source: ENTSO-E

# Wholesale electricity market

- Day-ahead market coupling through the coupling of cross-border electricity exchanges. Coupling of regional electricity markets – Nordic market, Central West, North West Europe...
- (Day-ahead) market coupling optimises interconnection capacity utilisation (calculation and allocation) and facilitates linking of buyers and sellers on either side of a border.
- Cross-border capacity allocation is carried out together with the financial energy settlement in one single operation at the exchange (no need for prior reservation of capacity) = implicit auctioning.

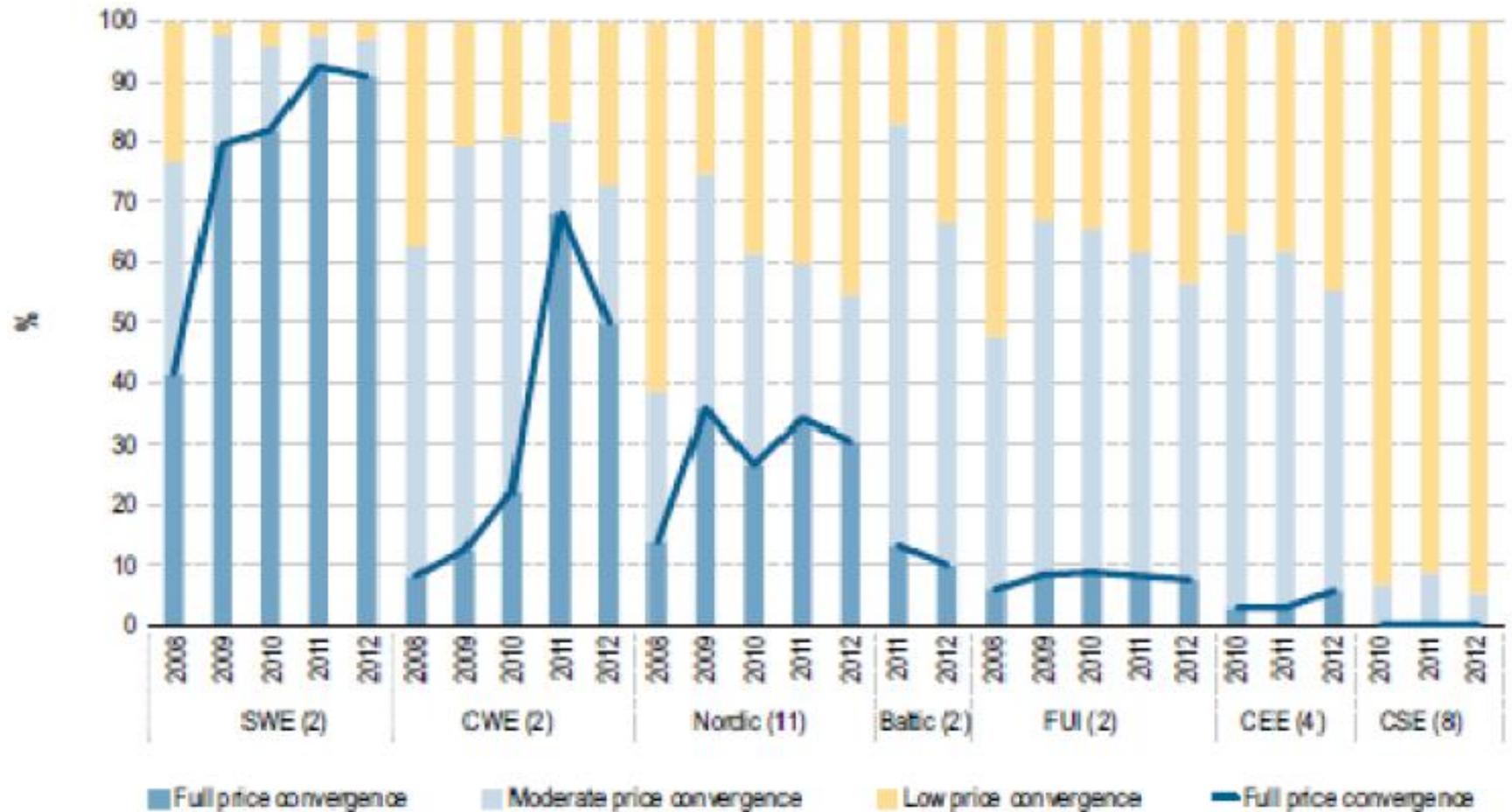
# Overview of market coupling towards a European day-ahead market



This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

# Price convergence in Europe by region, 2008-2012 (%)

Price convergence in Europe by region (ranked) – 2008 to 2012 (%)



Source: Platts, PXs and data provided by NRAs through the Electricity Regional Initiatives (ERI) (2013) and ACER calculations

Note: The numbers in brackets, e.g. SWE(2), refer to the number of bidding zones per region included in the calculations.

# Intra-day markets

- Intra-day and balancing markets largely national or bilateral.
  - Dutch-German border.
  - Dutch-Belgium border.
  - Nordpool Elbas platform.
  - Dutch-Norwegian NorNed interconnector.
  - Great Britain on BritNed.

# Retail market

- Still fragmented, regulated, with low level of switching.
- Still high generation concentration. In 8 MS more than 70% of generation controlled by historic incumbent.

Overview of incumbent's presence and foreign supply side substitution to promote retail market integration, December 2012

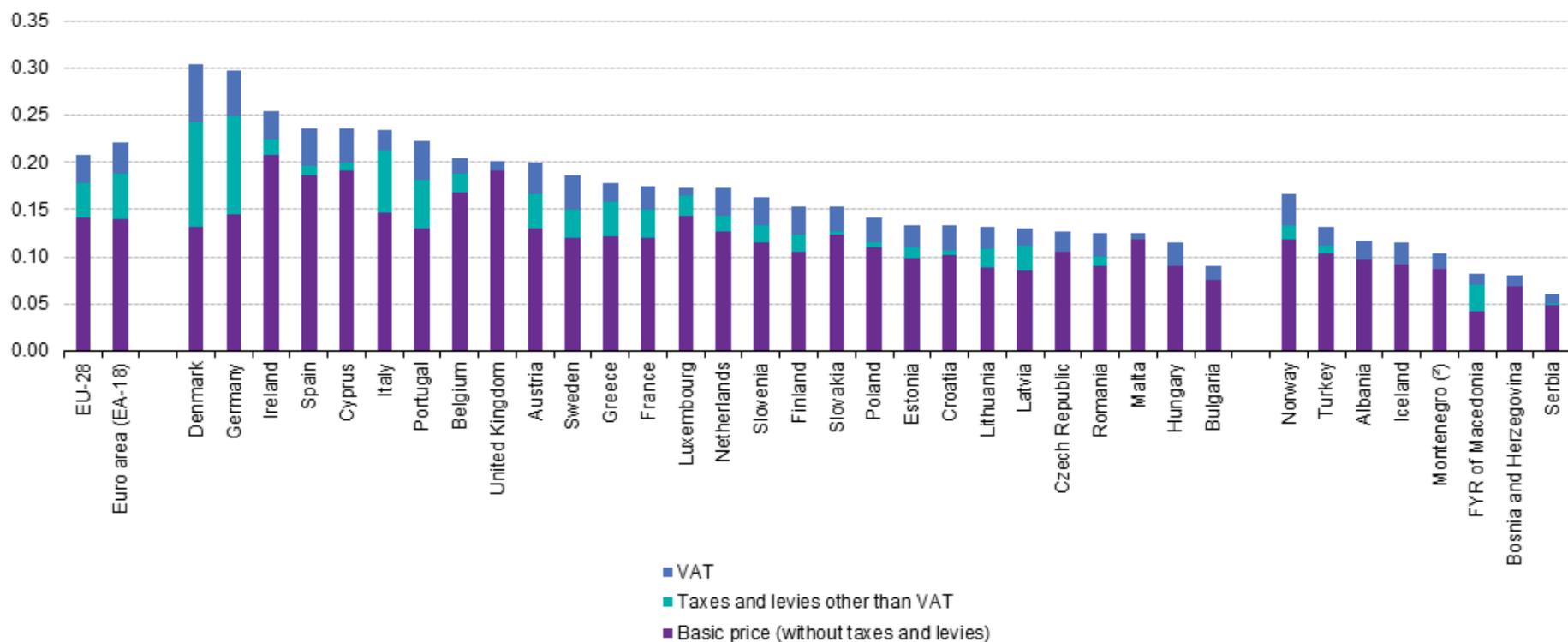
Presence of foreign players (capital city)	Estimated incumbent market share in the household market – December 2012 (capitals)		
	More than 90%	Between 50% and 90%	Less than 50%
More than 50%	Bulgaria (1/1); Hungary (1/2); Romania (1/1)		
Between 20% and 50%		The Czech Republic (5/24); Spain (4/16); The Netherlands (6/18); Portugal (2/4); Belgium (2/6)	Great Britain (4/14)
Between 0% and 20%	Northern Ireland (1/4); The Slovak Republic (6/16)	Germany (1/14); Finland (2/37); Ireland (1/4); Italy (2/7)	Sweden (4/41)
0%	Cyprus (0/1); Malta (0/1); Greece (0/1); Lithuania (0/1); Luxembourg (0/6); Latvia (0/1); Estonia (0/1); Poland (2/7); France (1/9)	Austria (0/18); Denmark (0/19); Slovenia (0/8)	Norway (0/11)

Source: ACER/CEER 2013.

# Prices

- Gap between household (EU-28 average of €140/MWh) and industry (€90/MWh) – different levels of taxation and RES surcharges.
- Since 2008 the wholesale prices have been falling by 1/3, retail prices have increased by 4%/y.
  - Due to the persistence of regulated prices and market concentration, the higher level of levies, taxes and network cost and low responsiveness of consumers to switch suppliers to better offer.

# Prices for household consumers, second half 2014 (eur/kWh)

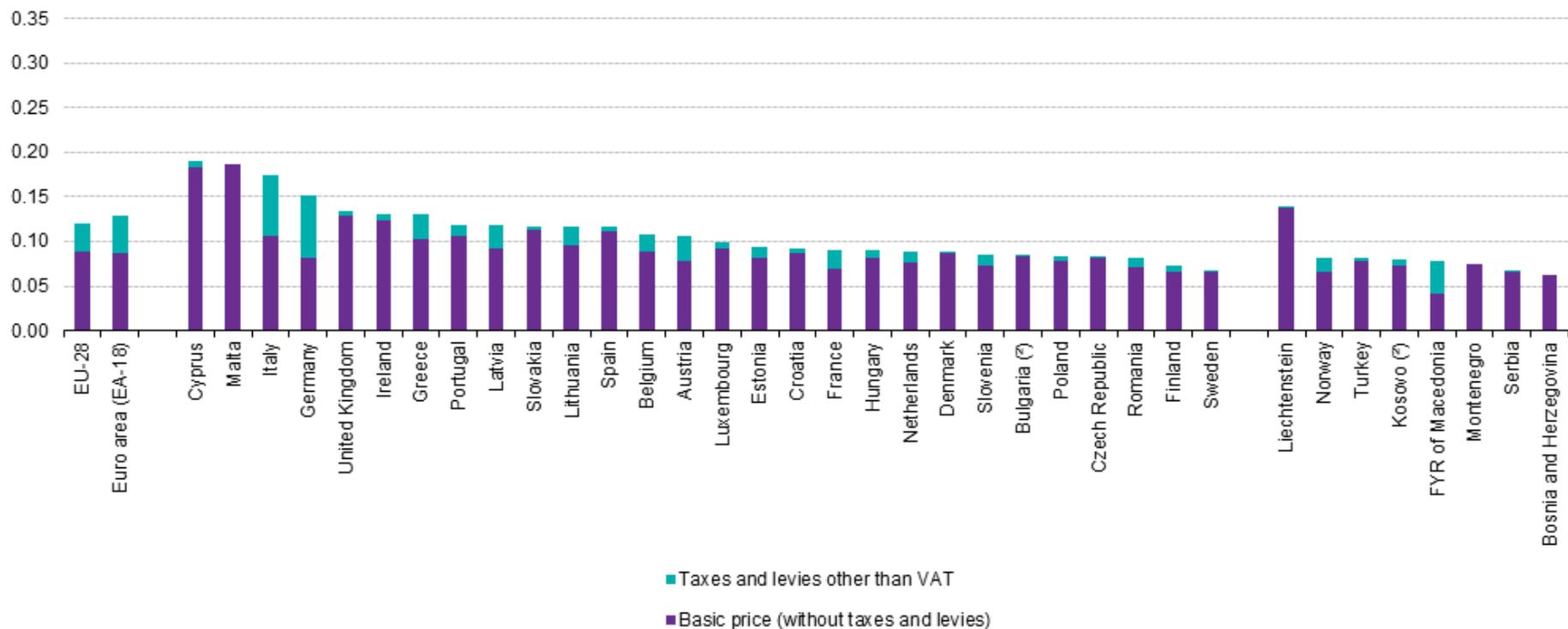


(\*) Annual consumption: 2 500 kWh < consumption < 5 000 kWh.

(?) Taxes and levies other than VAT are slightly negative and therefore the overall price is marginally lower than that shown by the bar.

Source: Eurostat (online data code: nrg\_pc\_204)

# Prices for industrial consumers, second half 2014 (eur/kWh)



(\*) Annual consumption: 500 MWh < consumption < 2 000 MWh. Excluding VAT.

(\*) Provisional.

Source: Eurostat (online data code: nrg\_pc\_205)

# Impact of IEM on security of supply

= power system's capability to meet changes in requirements through investment, operational and end-use responses.

- EU market integration and electricity trade increases interdependency among jurisdiction. But lack of integrated policies regarding a fuel mix.
  - + diversification (more flexibility, lower the risk of shortages).
  - -/+ exposure to market, price and generation development in neighbouring countries.
- EU legislation, network codes (network security and reliability code, code for operational procedures in an emergency...).
- Cooperation of TSOs (Ten year network development plan, regional investment plans...).

# Sources

- IEA (2014): Energy Policies of IEA Countries – The European Union.