ACER
Agency for the Cooperation of Energy Regulators

The 4th Annual Market Monitoring Report

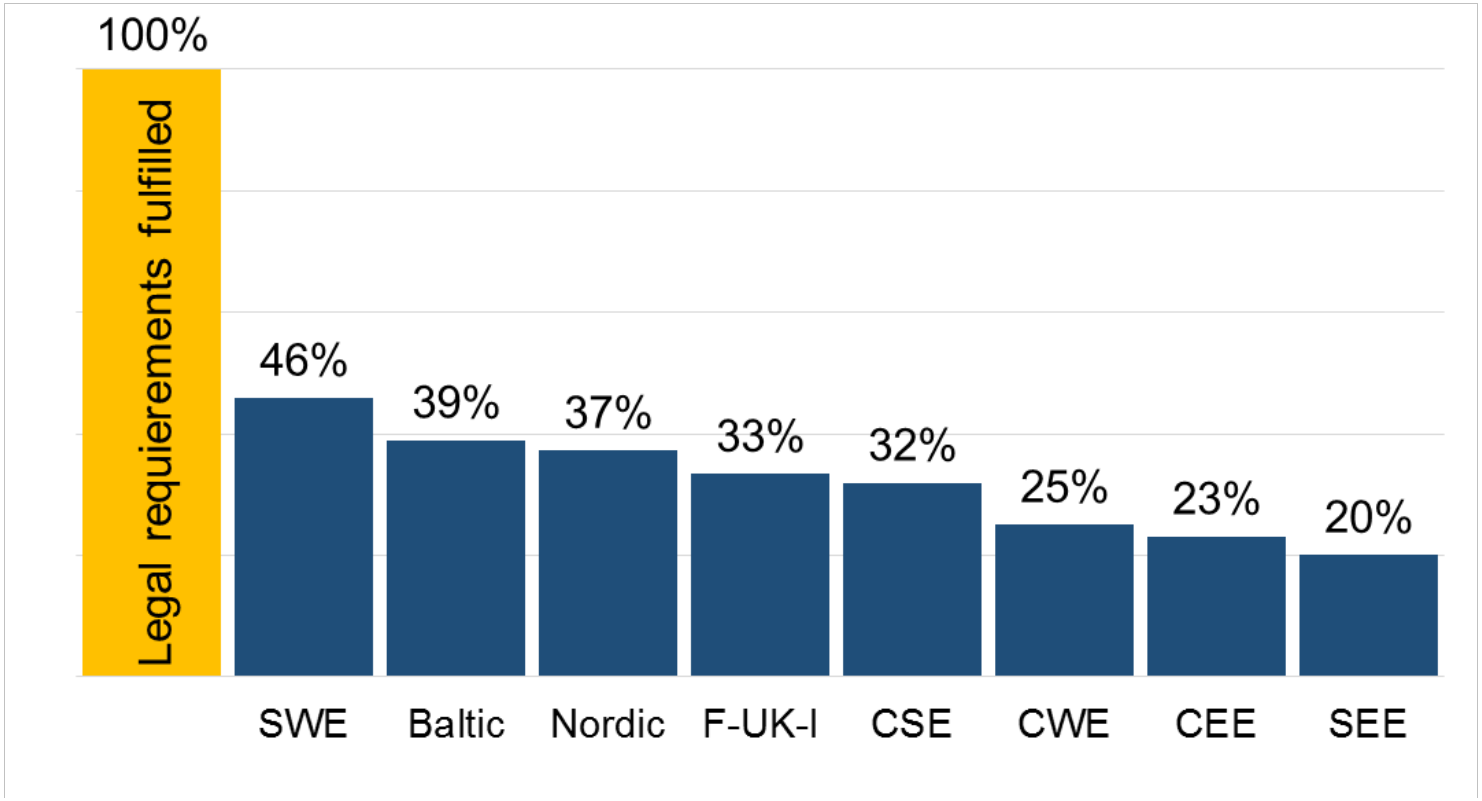
Increasing cross border tradable capacities

Christophe Gence-Creux
Head of the Electricity Department

Electricity Market Stakeholders Committee
Brussels, 3 February 2016

Cross-zonal capacity calculation methods could be significantly improved both in terms of coordination and efficiency

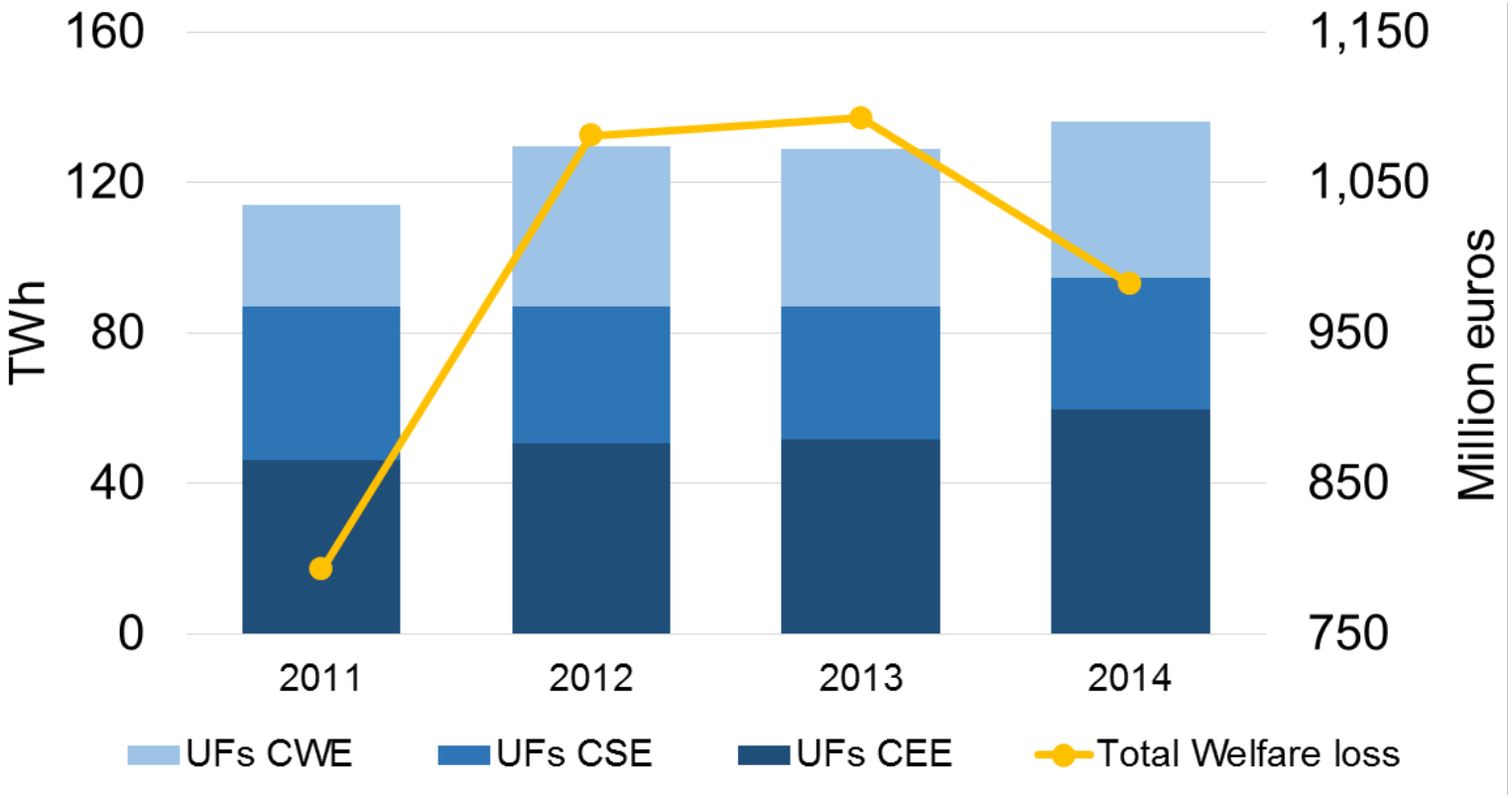
Regional performance based on fulfilment of capacity calculations requirements – 2014 (% - scoring)



Source: Data provided by NRAs through the ERI (2015), EMOS, ENTSO-E (2015) and ACER calculations. Note: Evaluation is based on frequency, coordination and hourly resolution of the applied capacity calculation methodology.

The level of Unscheduled Flows (UF) continues to increase in the CEE region

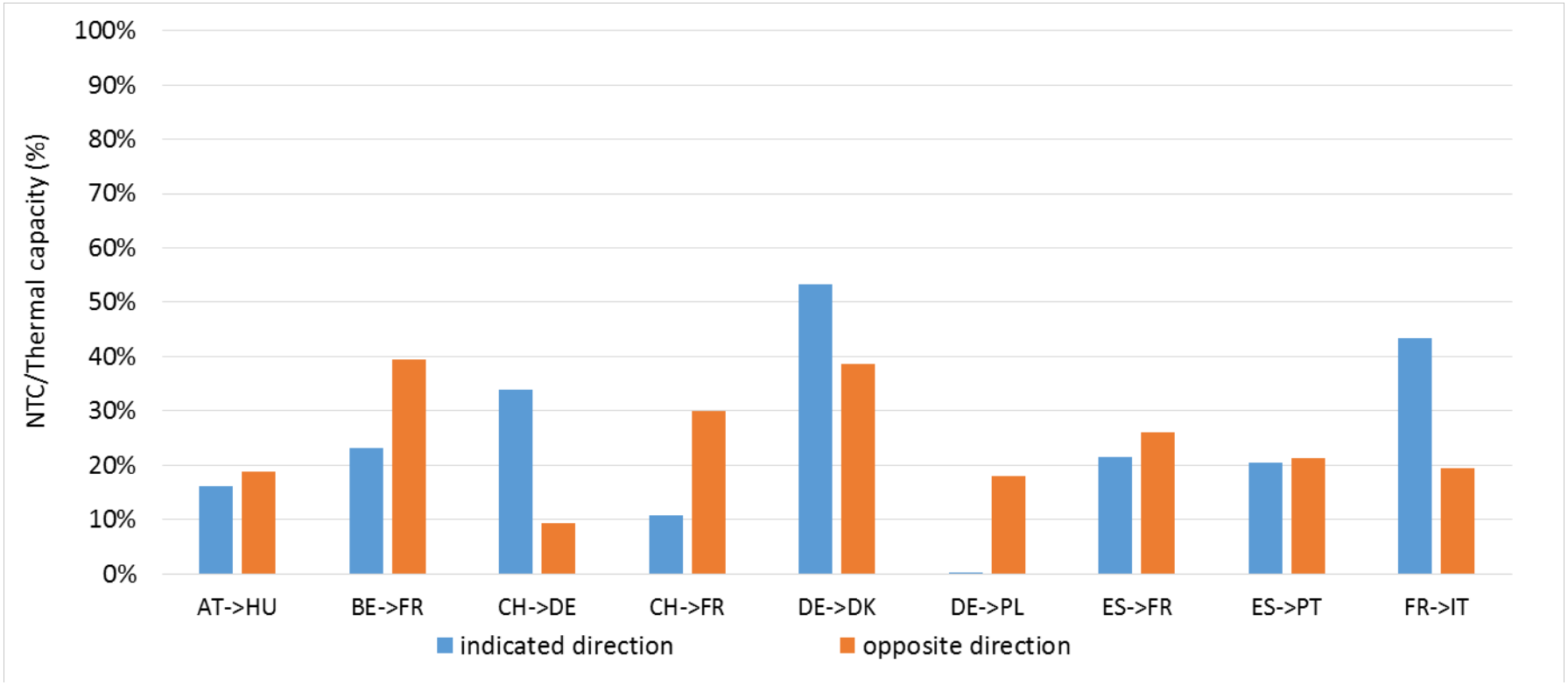
Level of unscheduled flows and total social welfare loss in the CWE, CSE and CEE between 2011 and 2014



Source: Vulcanus, EMOS, ENTSO-E (2015), and ACER calculations. Note: Unscheduled flows include loop flows and unscheduled allocated flows.

Electricity exchanges inside zones and those originating from cross-zonal exchanges should compete for the capacity of the network elements on equal terms

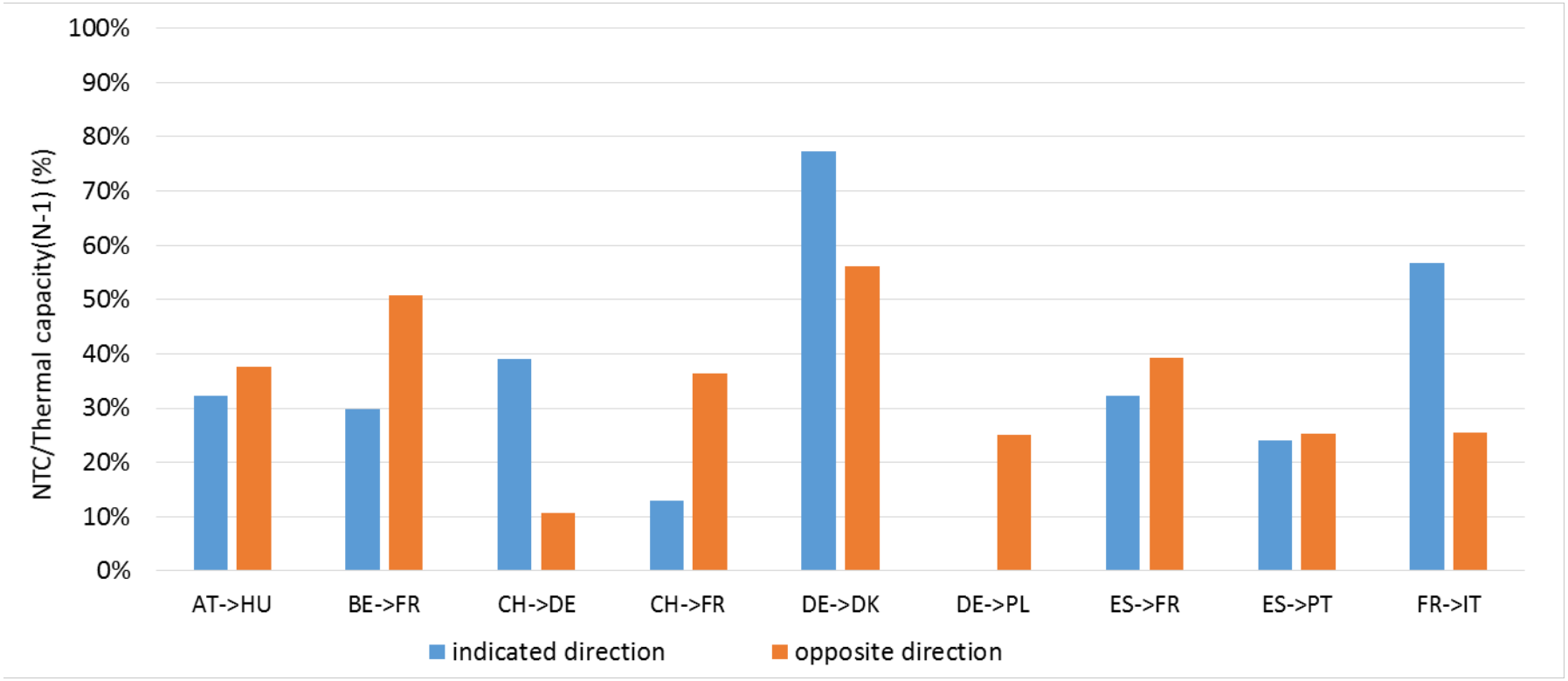
Ratio between the hourly averaged available net transport capacities (NTC) and aggregated thermal capacity of interconnectors – 2014 (%)



Source: Data provided by NRAs through the ERI (2015), EMOS, ENTSO-E (2015) and ACER calculations.

Electricity exchanges inside zones and those originating from cross-zonal exchanges should compete for the capacity of the network elements on equal terms

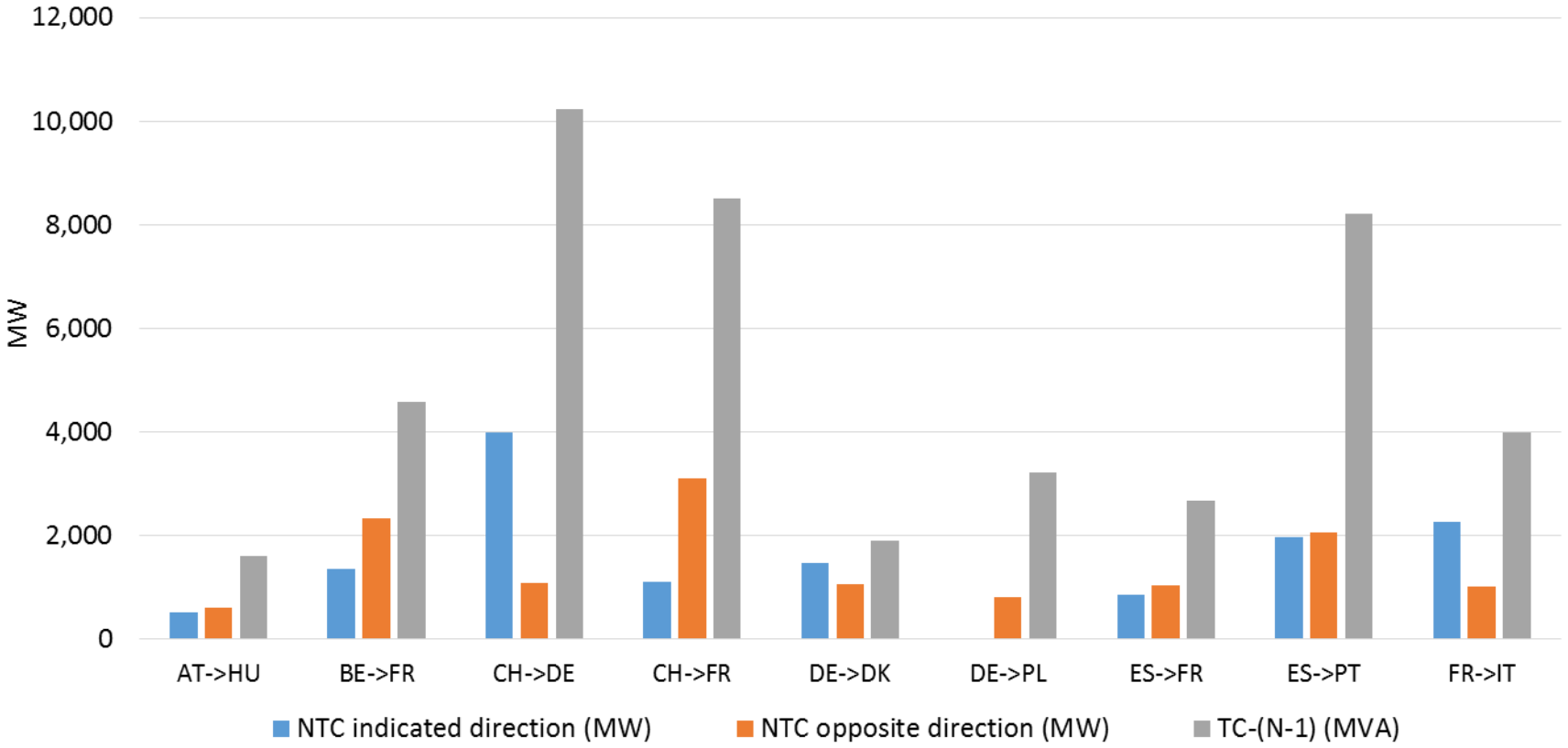
Ratio between the hourly averaged available net transport capacities (NTC) and aggregated thermal capacity of interconnectors after (N-1) criterion is included – 2014 (%)



Source: Data provided by NRAs through the ERI (2015), EMOS, ENTSO-E (2015) and ACER calculations.

Electricity exchanges inside zones and those originating from cross-zonal exchanges should compete for the capacity of the network elements on equal terms

Thermal capacity of interconnectors including (N-1) criterion compared to the hourly averaged net transport capacities (NTC) – 2014 (MW)



Source: Data provided by NRAs through the ERI (2015), EMOS, ENTSO-E and ACER calculations.

Electricity exchanges inside zones and those originating from cross-zonal exchanges should compete for the capacity of the network elements on equal terms

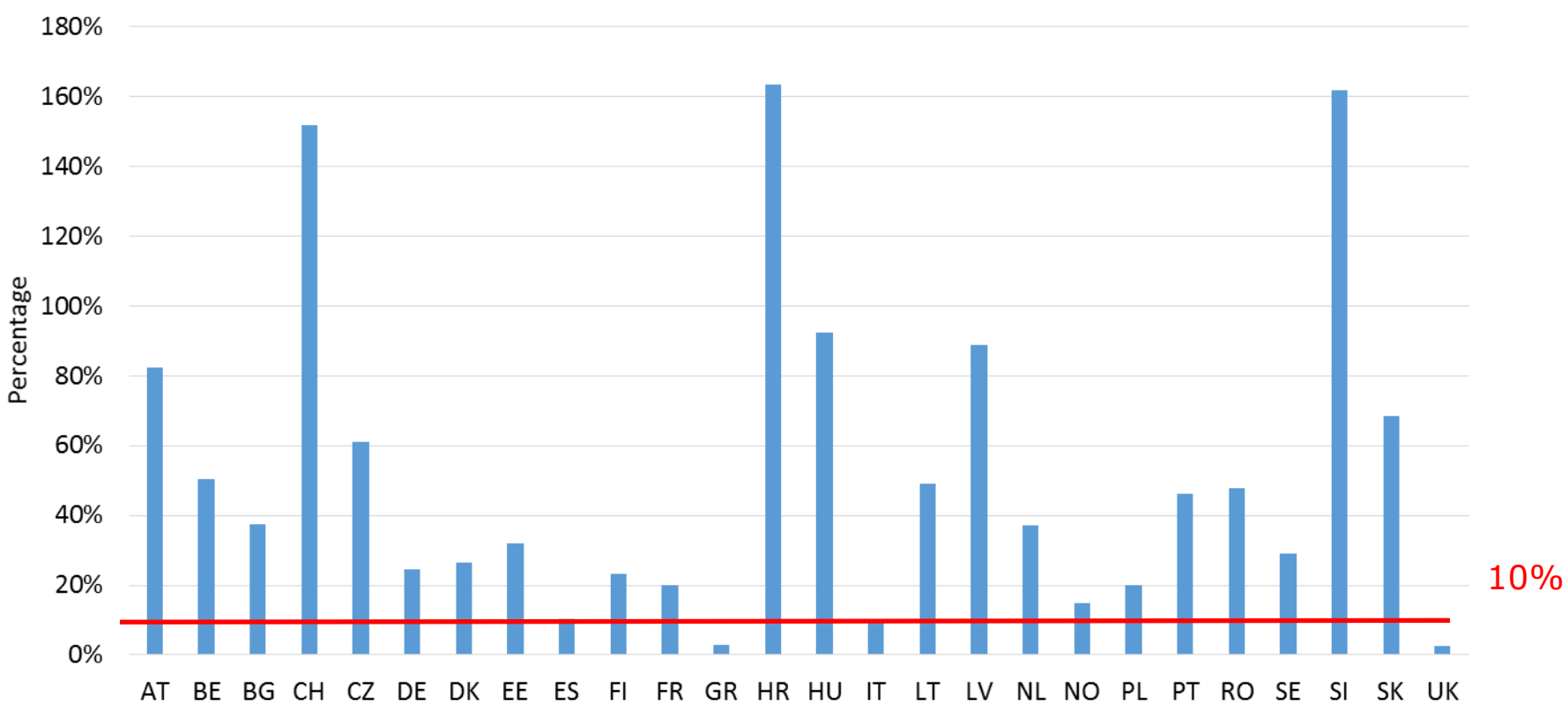
Accounting for (N-1) criterion on DE–FR border - 2014 (MW)

Circuit ID	Connection between:						Voltage of the circuit		Conventional transmission capacity of the connection (thermal)	
(Frontier point.line.circuit)	From substation			To substation			Forecast	Present	Forecast	Option one: Present with limits
Nr.	Country	Name	Operator	Country	Name	Operator	kV	kV	MVA	MVA limits
71.1.1	FR	Vigy	RTE	DE	Ensdorf	Amprion		380		1790
71.1.2	FR	Vigy	RTE	DE	Ensdorf	Amprion		380		1790
71.2.1	FR	St-Avold	RTE	DE	Ensdorf	Amprion		220		261
72.1.1	FR	Vogelgrün	RTE	DE	Eichstetten	TransnetBW		220	380	338
72.1.2	FR	Muhlbach	RTE	DE	Eichstetten	TransnetBW		380		1600
83.1.1	FR	Sierentz	RTE	DE	Asphard	Swissgrid/EnBW		380		1168

Sum of tie-lines	MAX tie-line	TC-(N-1)
6,947	1,970	4,977

Source: Data provided by NRAs through the ERI (2015), EMOS, ENTSO-E and ACER calculations.

Net Generation Capacity (NGC) per country compared to aggregated Thermal capacity of interconnectors including (N-1) criterion per country – 2014 (%)



Source: Data provided by NRAs through the ERI (2015), EMOS, ENTSO-E and ACER calculations.

Conclusions

More capacity could be made commercially available by

- Performing more coordinated capacity calculation in all timeframes
- Implementing flow-based capacity calculation methods where appropriate
- Ensuring a more equal treatment of internal and cross-zonal exchanges through:
  - a comprehensive review of bidding zones
  - Improvements of the capacity calculation methods.

COMMENTS WELCOME!

Thank you for your attention

- Retail electricity and gas markets

www.acer.europa.eu

Annex 1: Calculculation of CBC 'lost' across EU borders - 2014

Country borders	TC per border as per ERI 2014 data (MVA)	MAX interconnector per border as per YS&AR 2013 (MVA)	TC with (N-1) criterion included (MVA)	2014 NTC in indicated direction (MW)	2014 NTC in opposite direction (MW)	TC-(N-1) minus NTC in indicated direction (MW)	TC-(N-1) minus NTC in opposite direction (MW)	Only positive values (MW)	Only positive values (MW)
AT->CH	4,446	1,330	3,116	612	1,193	2,504	1,923	2,504	1,923
AT->CZ	3,634	1,559	2,075	619	586	1,455	1,488	1,455	1,488
AT->HU	3,199	1,603	1,596	514	599	1,081	996	1,081	996
AT->IT	452	257	195	217	96	-22	98		98
AT->SI	2,837	450	2,387	684	946	1,702	1,440	1,702	1,440
BE->FR	5,876	1,303	4,573	1,361	2,321	3,212	2,251	3,212	2,251
BE->NL	6,325	1,476	4,849	1,336	1,240	3,513	3,609	3,513	3,609
BG->GR	1,225	700	525	423	316	102	209	102	209
CH->DE	11,809	1,580	10,229	4,000	1,094	6,229	9,134	6,229	9,134
CH->FR	10,358	1,843	8,515	1,108	3,093	7,407	5,421	7,407	5,421
CH->IT	8,635	1,665	6,970	2,549	1,717	4,421	5,253	4,421	5,253
CZ->DE	6,653	1,663	4,990	2,722	1,321	2,268	3,669	2,268	3,669
CZ->PL	3,571	1,088	2,483	598	639	1,885	1,844	1,885	1,844
CZ->SK	4,486	1,442	3,044	1,672	1,187	1,372	1,857	1,372	1,857
DE->DK	2,766	862	1,904	1,473	1,069	431	835	431	835
DE->FR	6,204	1,790	4,414	2,472	1,798	1,941	2,615	1,941	2,615
DE->NL	8,734	1,790	6,944	2,231	2,257	4,712	4,686	4,712	4,686
DE->PL	4,525	1,302	3,223	3	809	3,220	2,414	3,220	2,414
DE->SE	690	690	0	448	385	-448	-385		
ES->FR	4,013	1,348	2,665	861	1,045	1,803	1,620	1,803	1,620
ES->PT	9,676	1,469	8,207	1,980	2,069	6,226	6,138	6,226	6,138
FI->EE	1,000	650	350	795	838	-445	-488		
FI->SE	4,475	800	3,675	2,238	2,579	1,437	1,096	1,437	1,096
FR->IT	5,236	1,244	3,992	2,267	1,021	1,724	2,971	1,724	2,971
UK->FR	2,000	1,000	1,000	1,829	1,829	-829	-829		
UK->NL	1,000	500	500	852	853	-352	-353		
HR->SI	4,104	1,164	2,940	1,447	1,380	1,493	1,560	1,493	1,560
HU->HR	5,131	1,330	3,801	1,000	1,200	2,801	2,601	2,801	2,601
HU->RO	2,451	1,300	1,151	352	349	799	802	799	802
HU->SK	2,771	1,606	1,165	761	1,096	404	69	404	69
IT->GR	500	500	0	224	224	-224	-224		
IT->SI	2,120	1,860	260	649	488	-389	-228		
LT->LV	2,843	832	2,011	485	921	1,525	1,089	1,525	1,089
LV->EE	1,014	467	547	809	781	-262	-235		
NL->NO	730	730	0	678	664	-678	-664		
NO->DK	1,266	350	916	807	853	109	63	109	63
NO->SE	5,950	2,000	3,950	2,974	3,149	976	801	976	801
PL->SE	660	660	0	110	373	-110	-373		
PL->SK	2,078	831	1,247	491	452	756	795	756	795
RO->BG	5,236	1,107	4,129	93	118	4,035	4,011	4,035	4,011
SE->DK	2,765	830	1,935	1,733	1,911	202	24	202	24

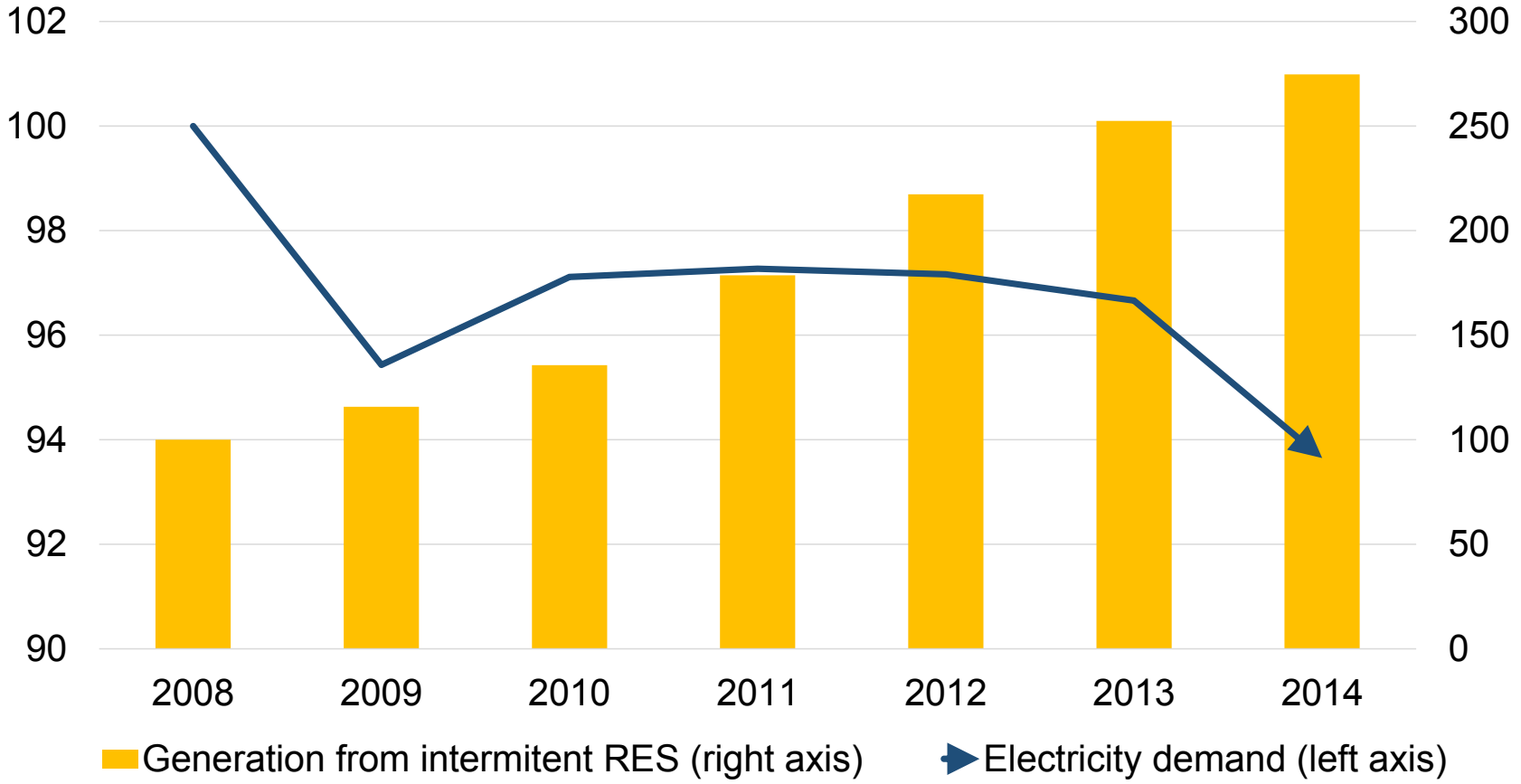
After accounting for (N-1) criterion the remaining physical capacity is compared to NTC values. 'Lost' capacity is then calculated only when the difference is positive and is summed for all borders in both directions.

'Lost' CBC in Europe 2014 145 GW

Source: Data provided by NRAs through the ERI (2015), EMOS, ENTSO-E and ACER calculations.

In 2014 electricity demand decreased (-6% since 2008) while RES generation continued to increase (almost tripled since 2008)

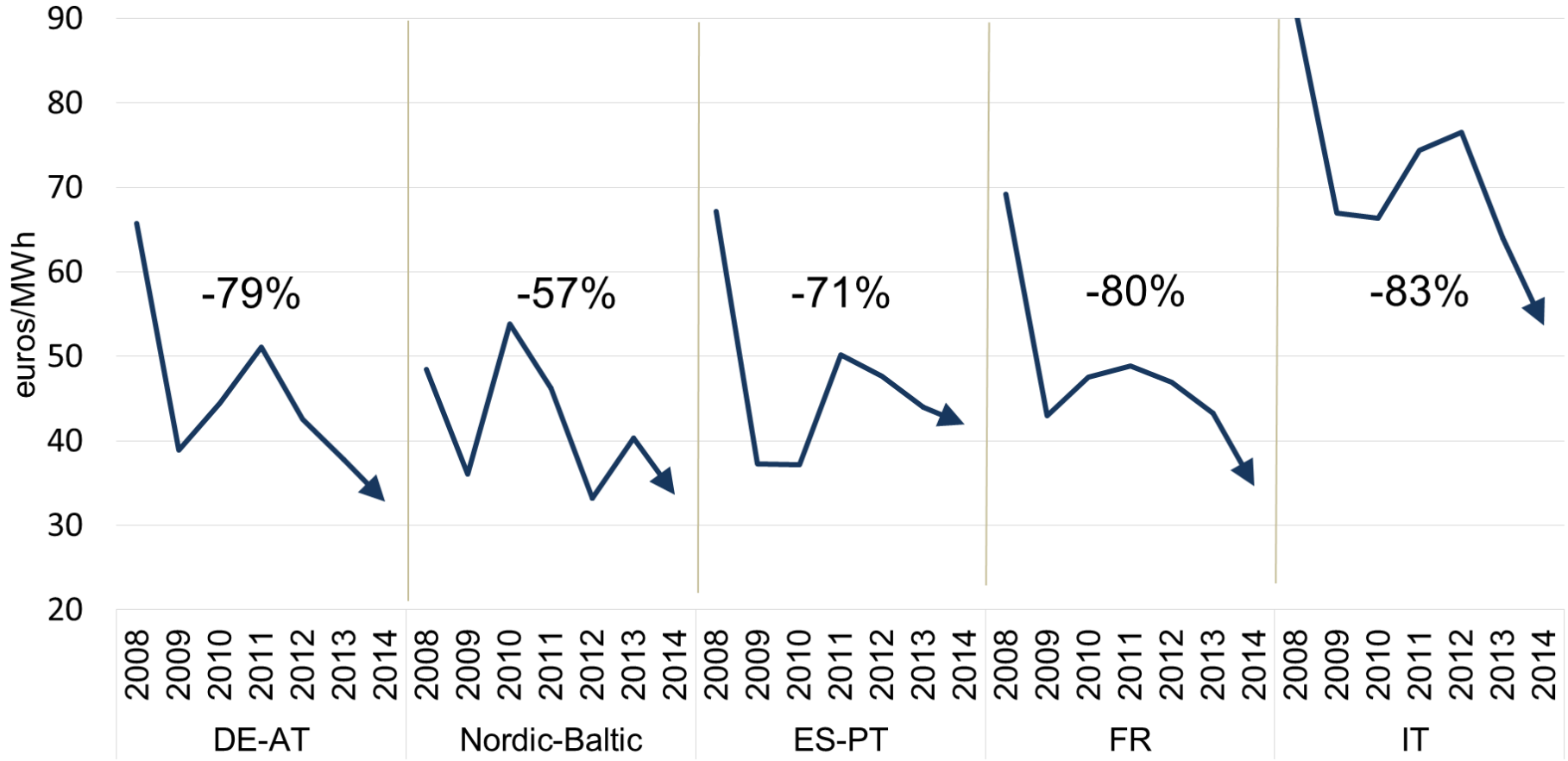
Evolution of electricity demand and generation from RES in Europe - for both demand and RES generation – 2008 = 100



Source: ENTSO-E and Eurostat (2015). Note: RES stands for renewable energy sources.

…in combination with generation overcapacity and 'cheap coal', drove wholesale prices further down in 2014 (minus 50-80% since 2008)

Evolution of day-ahead prices in Europe – 2008-2014



Source: EMOS (2015).

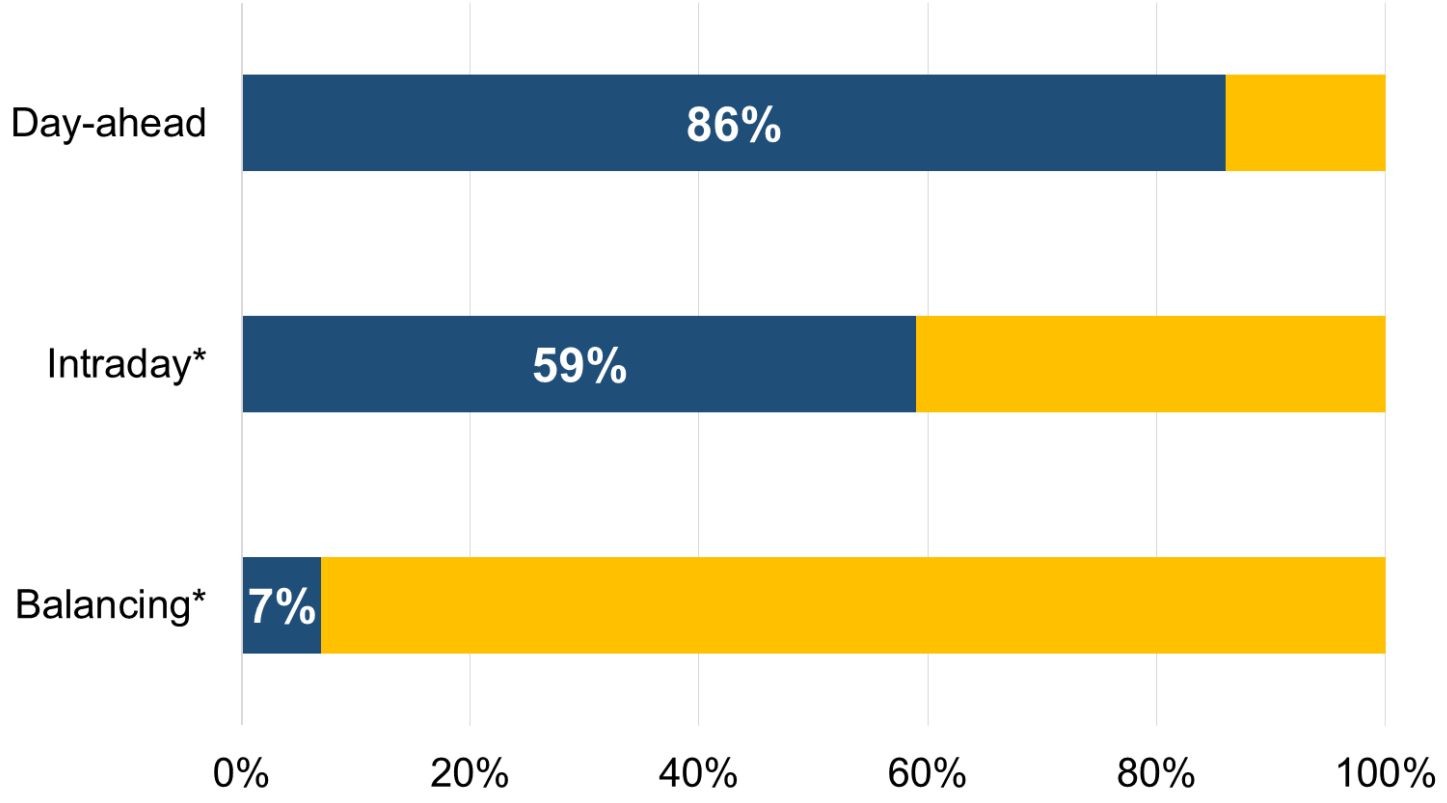
Recommendations – use of the network

More capacity could be made commercially available by

- Performing more coordinated capacity calculation in all timeframes
- Implementing flow-based capacity calculation methods where appropriate
- Ensuring a more equal treatment of internal and cross-zonal exchanges through:
  - a comprehensive review of bidding zones
  - improve capacity calculation methods.

The use of cross-zonal capacity in the day-ahead timeframe is close to optimal, but in the intraday and balancing market timeframe it can be significantly improved

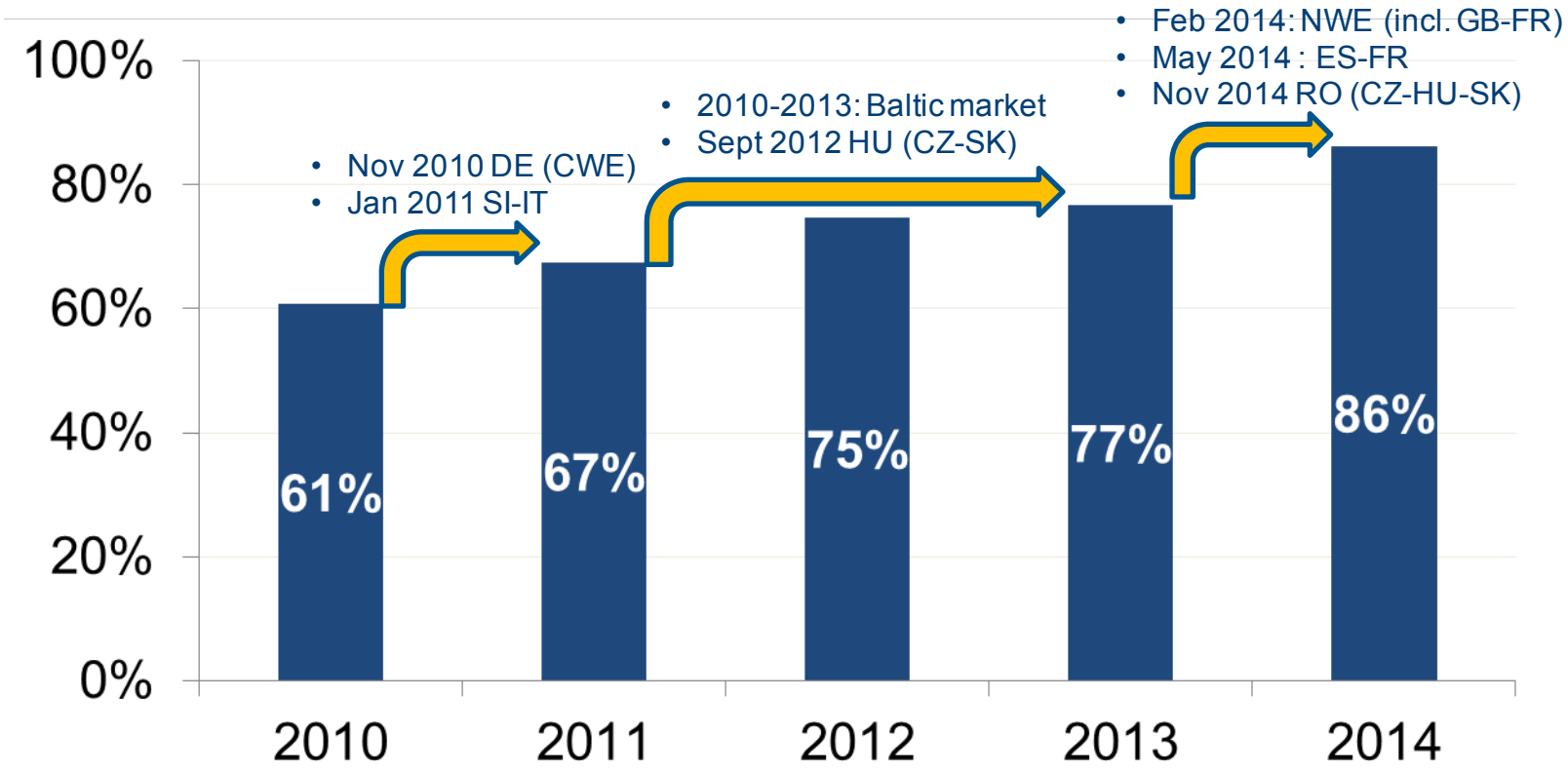
Level of efficiency (% use of commercial capacity available in the 'economic' direction) in the use of interconnectors in Europe – 2014



*Source: ENTSO-E, NRAs, EMOS and Vulcanus (2015). Note: *Intraday and Balancing values are based on a selection of EU borders.*

Day-ahead market coupling has enabled a more efficient use of available cross-zonal capacity and helps price formation of hedging products

Percentage of available capacity (NTC) used in the 'right direction' on all EU electricity borders – 2010-2014 (%)



Source: EMOS and Vulcanus (2015).

Intraday liquidity is low though the highest levels are observed in markets with the highest RES penetration

Intermittent generation and intraday liquidity in a selection of Member States – 2014 (%)

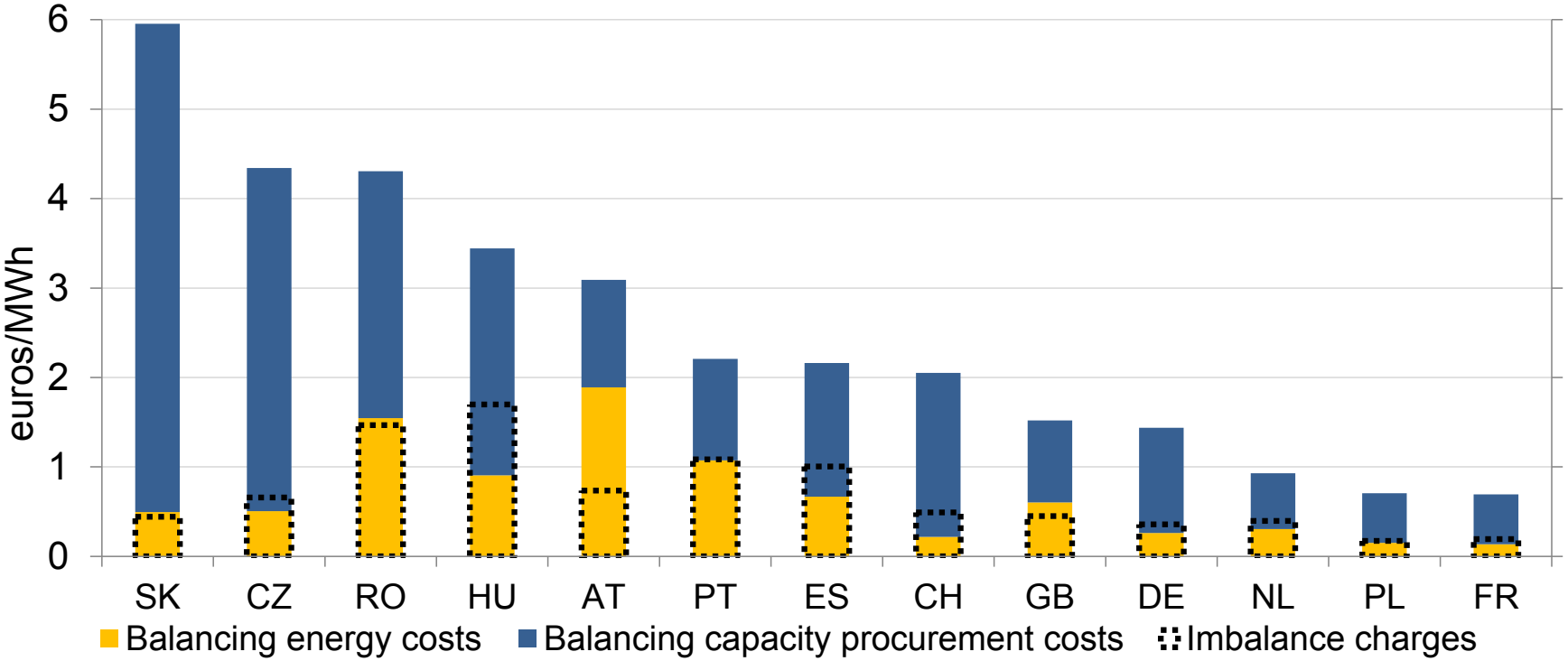
Market	Intermittent generation (% installed capacity)	Ratio ID volumes/demand
Spain	22%	12.1%
Italy	18%	7.4%
Portugal	21%	7.6%
Germany	28%	4.6%
Great Britain	12%	4.4%
Slovenia	7%	1.0%
Belgium	19%	1.0%
Sweden	11%	1.0%
Lithuania	8%	1.0%
France	10%	0.7%
Czech Republic	10%	0.7%
Netherlands	10%	0.2%
Poland	9%	0.1%

Liquid ID markets facilitate RES integration in EU electricity markets.

Source: ENTSO-E, NRAs and Power exchanges (2015).

The costs of balancing services are becoming a relevant part of the energy bill. Cross-zonal exchanges of balancing services can reduce costs...

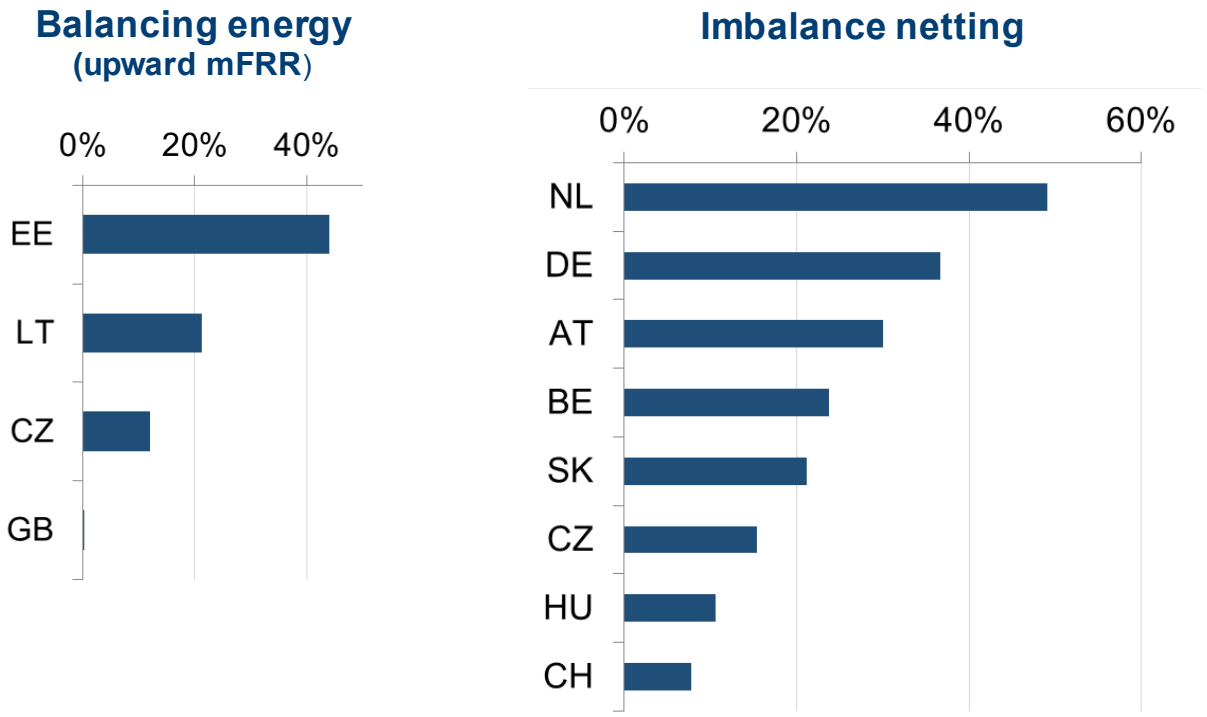
Overall costs of balancing (capacity and energy) and imbalance charges over national electricity demand in a selection of European markets – 2014 (euros/MWh)



Source: NRAs (2015).

… though exchanges of balancing services in the EU is limited. The main exception is imbalance netting which is successfully applied across more than one third of EU borders

Cross-border exchange of balancing services: balancing services activated abroad as a percentage of national needs



The potential benefits from imbalance netting and a further exchange of balancing energy are estimated to be higher than 1 billion euros/year for the whole EU.

Source: NRA (2015). Note: mFRR stands for manually activated Frequency Restoration Reserves.

Uncoordinated development of capacity mechanisms (CM)

State of play – September 2015

Strategic reserves for DK2 region from 2016-2018 (and potentially also from 2019-2020)

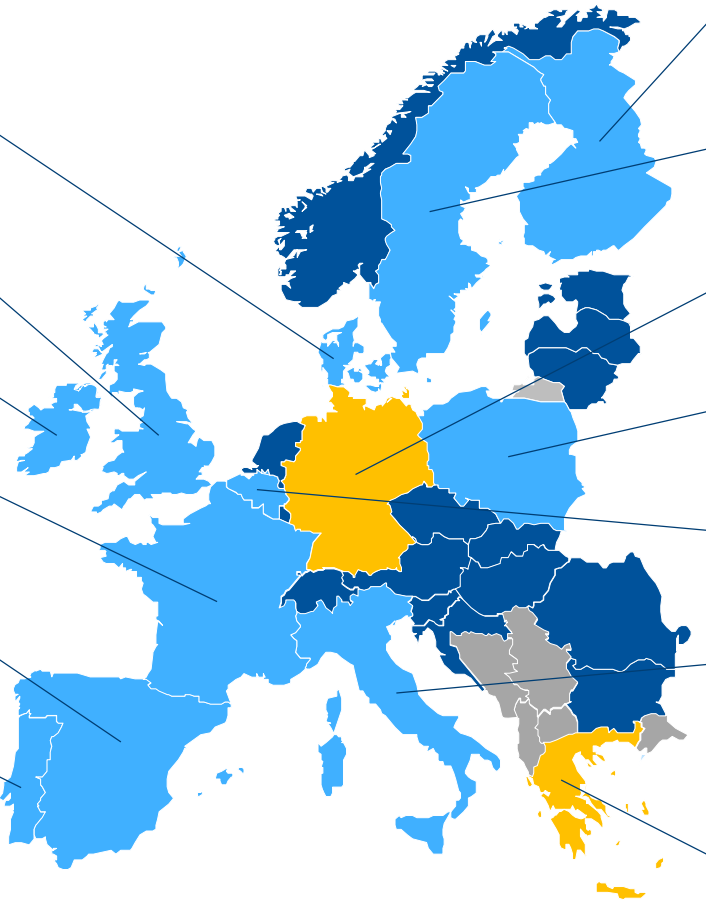
Capacity auction (since 2014 - first delivery in 2018/19)

Capacity payments (since 2007) Considering reliability options

Capacity requirements (certification started 1 April 2015)

Capacity payments (since 2008) – Tendering for capacity considered but no plans

Capacity payments (Since 2010 partially suspended between May 2011 and December 2014)



Strategic reserves (since 2007)

Strategic reserves (since 2004) - gradual phase-out 2020 and considering a permanent market-based system after 2020

Debate ongoing

Strategic reserve (from 2016 on, for 2 to 3 more years) - Capacity market under discussion

Strategic reserves (since 1 November 2014)

Reliability options (first auction end 2016, first delivery of contracted capacity is expected in 2021)

New Capacity Mechanism under assessment by DG COMP (Capacity payments from 2006 to 2014)

No CM (energy only market)
CM proposed/under consideration
CM operational

Source: NRAs (2015).

Recommendations

- **Use of the day-ahead cross-border capacities can be further improved by**
  - Implementing market coupling on the remaining borders (12 out of 40 borders)

- **Intraday liquidity can be further improved by**
  - Moving gate-closure-time closer to real time
  - Applying balancing responsibility to renewable resources
  - Aligning intraday and balancing market time units
  - Ensuring TSOs perform intraday capacity recalculation
  - Ensuring imbalance charges fully reflect the costs of balancing

- **Efficiency in the provision of balancing services can be further improved by**
  - Ensuring that imbalancing charges reflect the value of flexibility
  - Implement the balancing network code

- **When considering or implementing capacity mechanisms**
  - Remove the remaining barriers in “energy only markets”
  - Coordinate national SoS approaches including a pan-European wide coordinated adequacy assessment
  - When implementing capacity mechanisms, do not distort the IEM