

The Future of European Energy



2012 Future Energy Scenarios
London, 27 September 2012
Daniel Dobbeni

entsoe 
Reliable Sustainable Connected

Outline

- **ENTSO-E: role, membership, structure, ...**
- **What will it look like in 10 years?**
- **Priorities ...**
- **Costs impact**

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ENTSO-E role

41 TSO members from 34 countries

Major responsibilities

- Network codes
- 10 year network plans
- Adequacy Forecasts
- Tools and processes for market integration
- R&D Plan

**Through its members deliver
infrastructure and market tools**

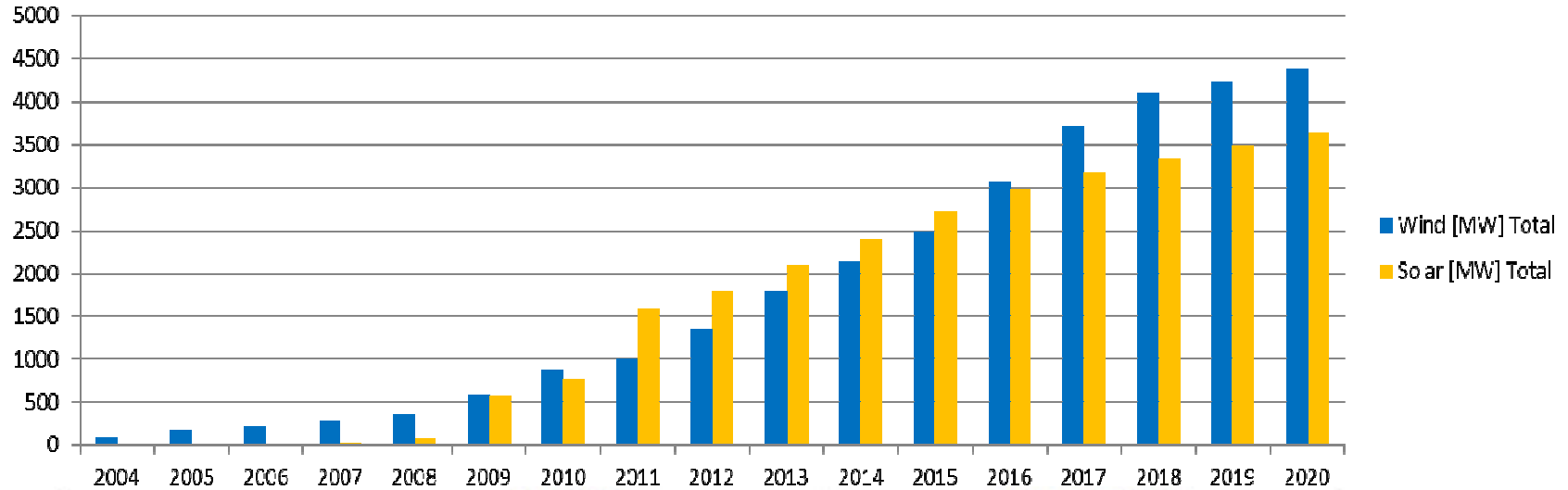


Outline

- ENTSO-E: role, membership, structure, ...
- **What will it look like in 10 years?**
 - **Hardware**
- Priorities ...
- Costs impact

1. RES : the game changer

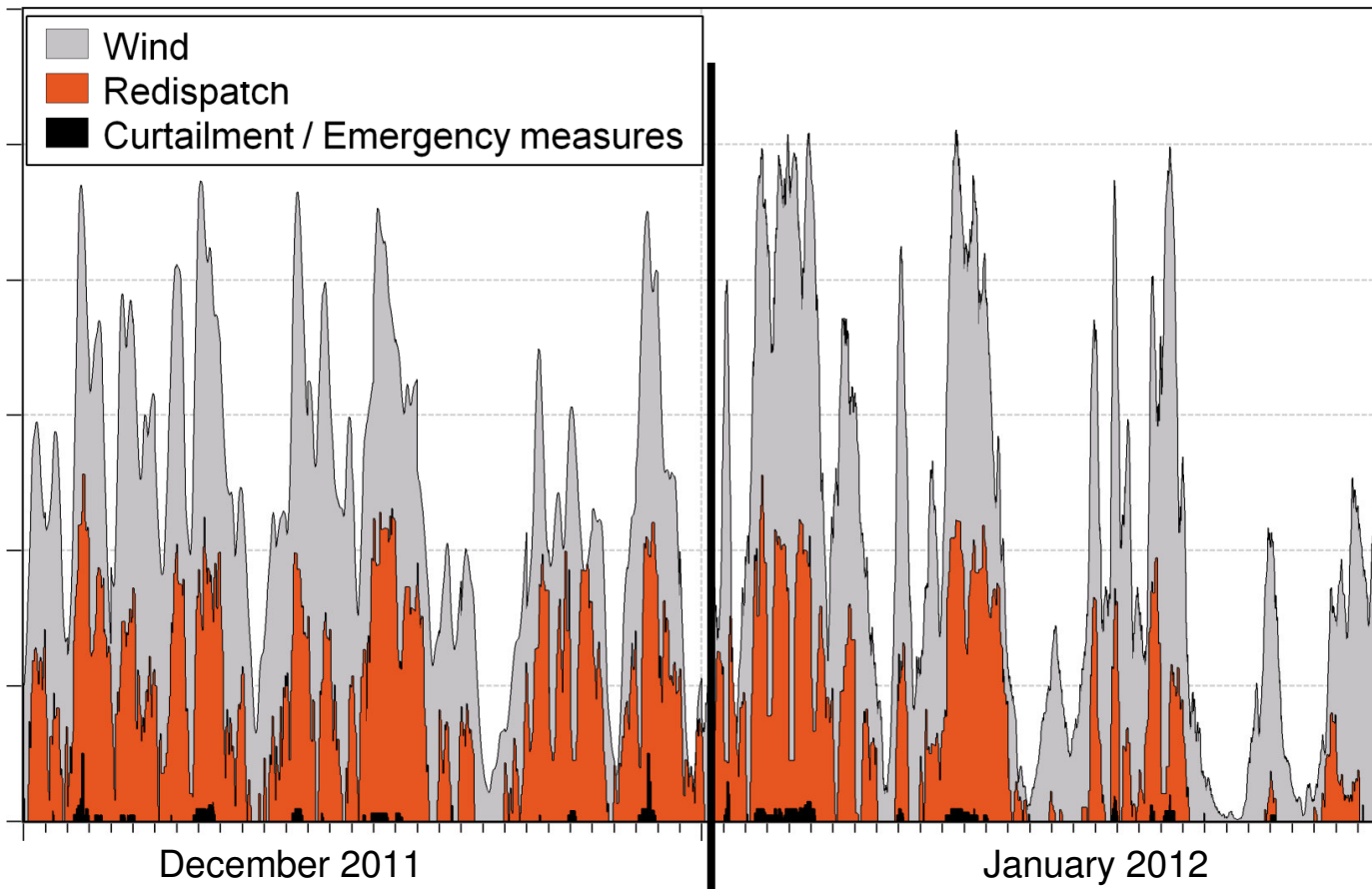
Installed capacity wind and PV Belgium [MW]



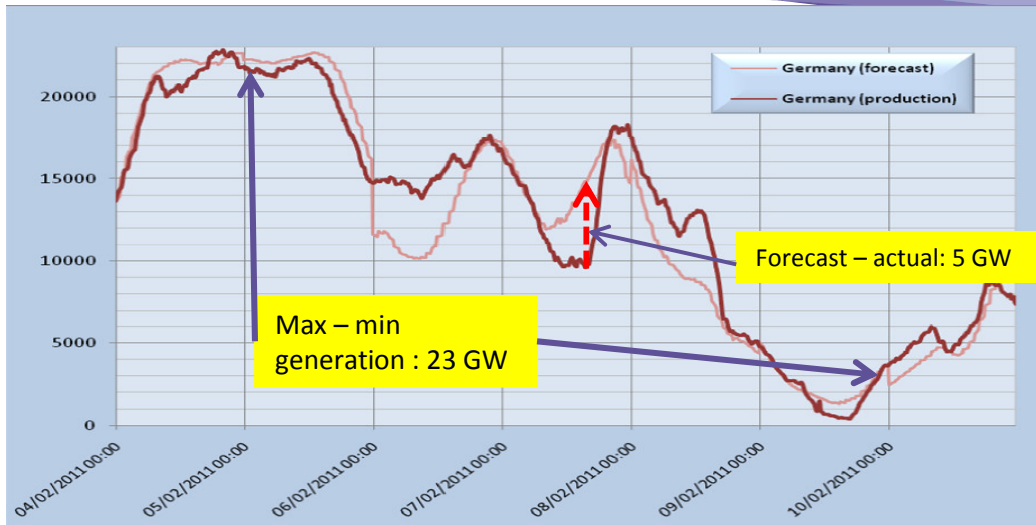
External study	2009 SAR					2020 ENT SO-E				
	BE	DE	FR	NL	UK	BE	DE	FR	NL	UK
Load	13.9	73	92.4	17.5	58.5	(15.9)	(75.1)	(76.4)	(17.9)	(57.4)
Nuclear Power	5.9	20.3	63.3	0.5	10.8	4.1	18.8	66.8	0.5	11.2
CCGT	6.8	17.5	8.3	19.0	27.1	10.3	18.0	7.1	21.8	32.3
RES	1.8	36.7	5.6	3.0	1.4	8.1	107.0	33.4	12.6	27.0
Wind Onshore	0.5	24.9	4.4	2.2	1.4	2.3	36.0	19.0	6.0	9.0
Wind Offshore						2.0	10.0	6.0	5.2	16.4
Other (solar+other)	1.3	11.8	1.2	0.8	0.0	3.8	61.0	8.4	1.4	1.7
Net Gen. Capacity	17.6	134.2	119.2	26.6	73.8	24.1	196.8	147.1	44.1	92.2

X 4

.. RES = transmission capacity or ...



.. RES = flexibility or ...



For Germany alone...

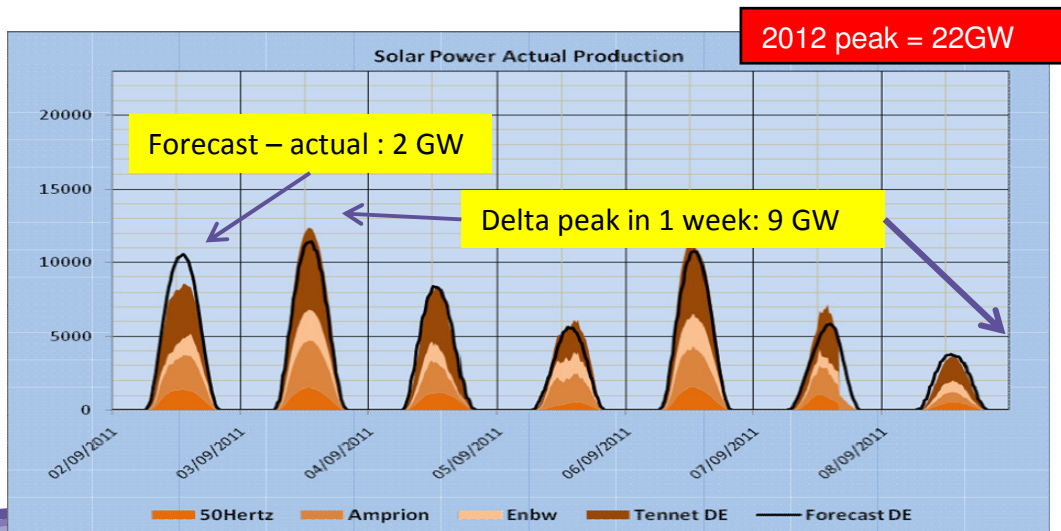
around 50% generation = Wind + PV

Flexible CCGT = 2000-3000 h/yr

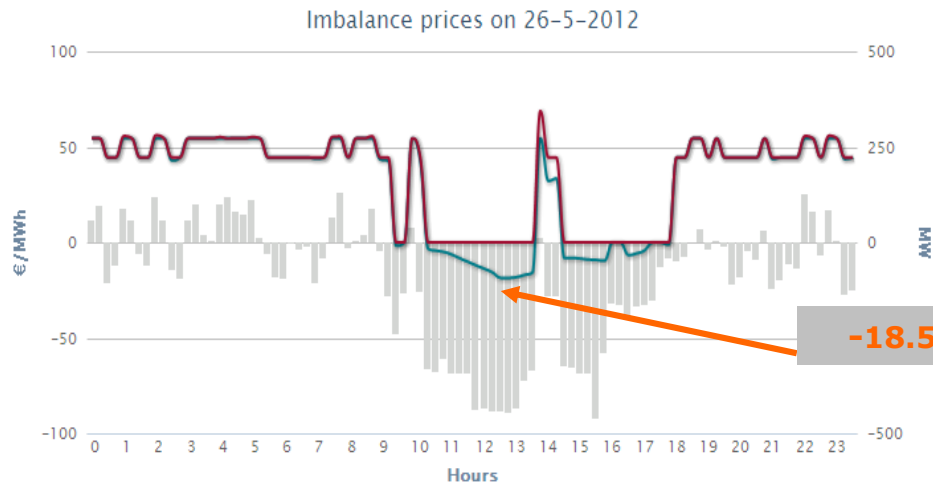
Reserves R1-R2-R3
due to forecast error = ~ 5 GW

Assuming 400 MW CCGT units with
fast ramping of ~150 MW

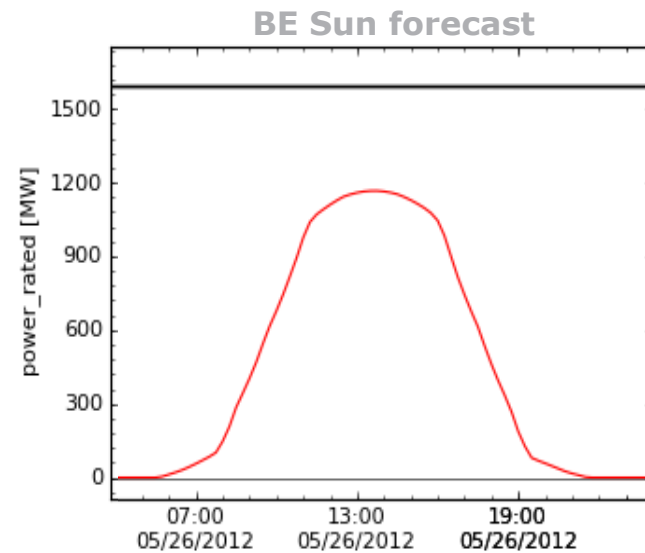
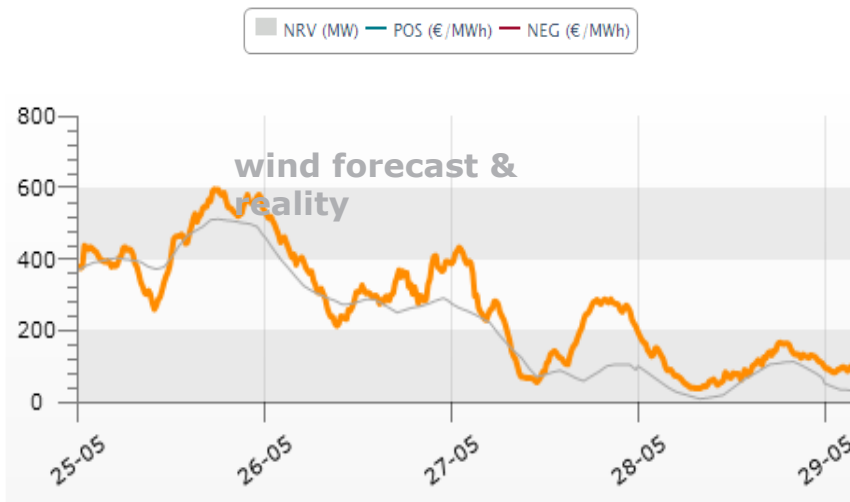
approx. 33 CCGT units



.. RES = highly liquid intraday market or ...

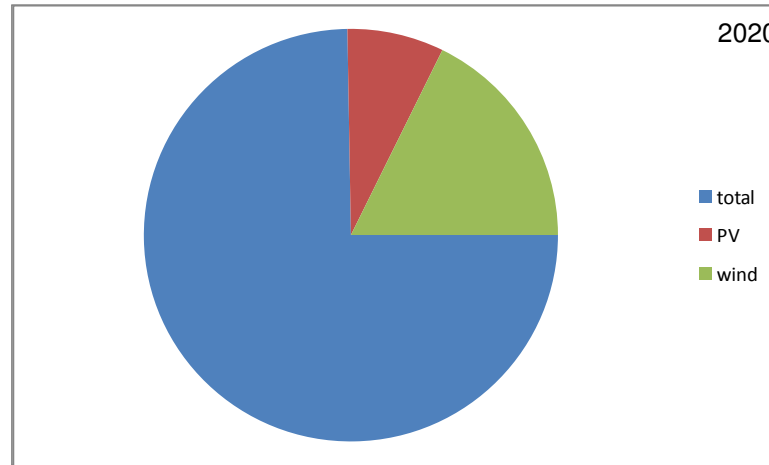


Negative prices !

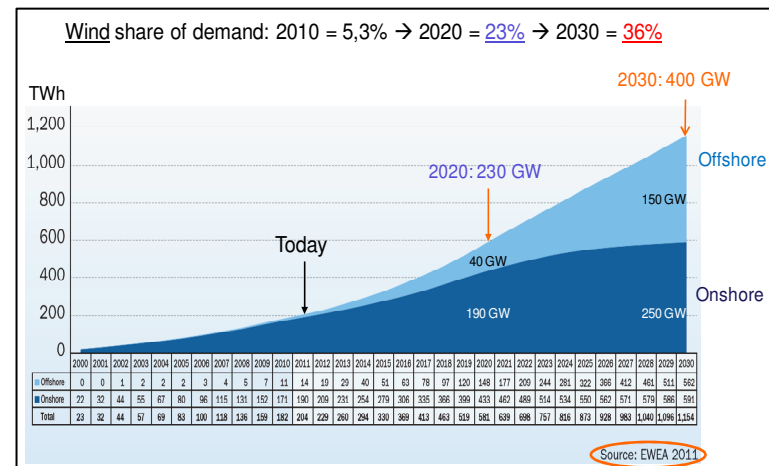


2. A Grid for all kind of Power flows

Huge flows all over Europe



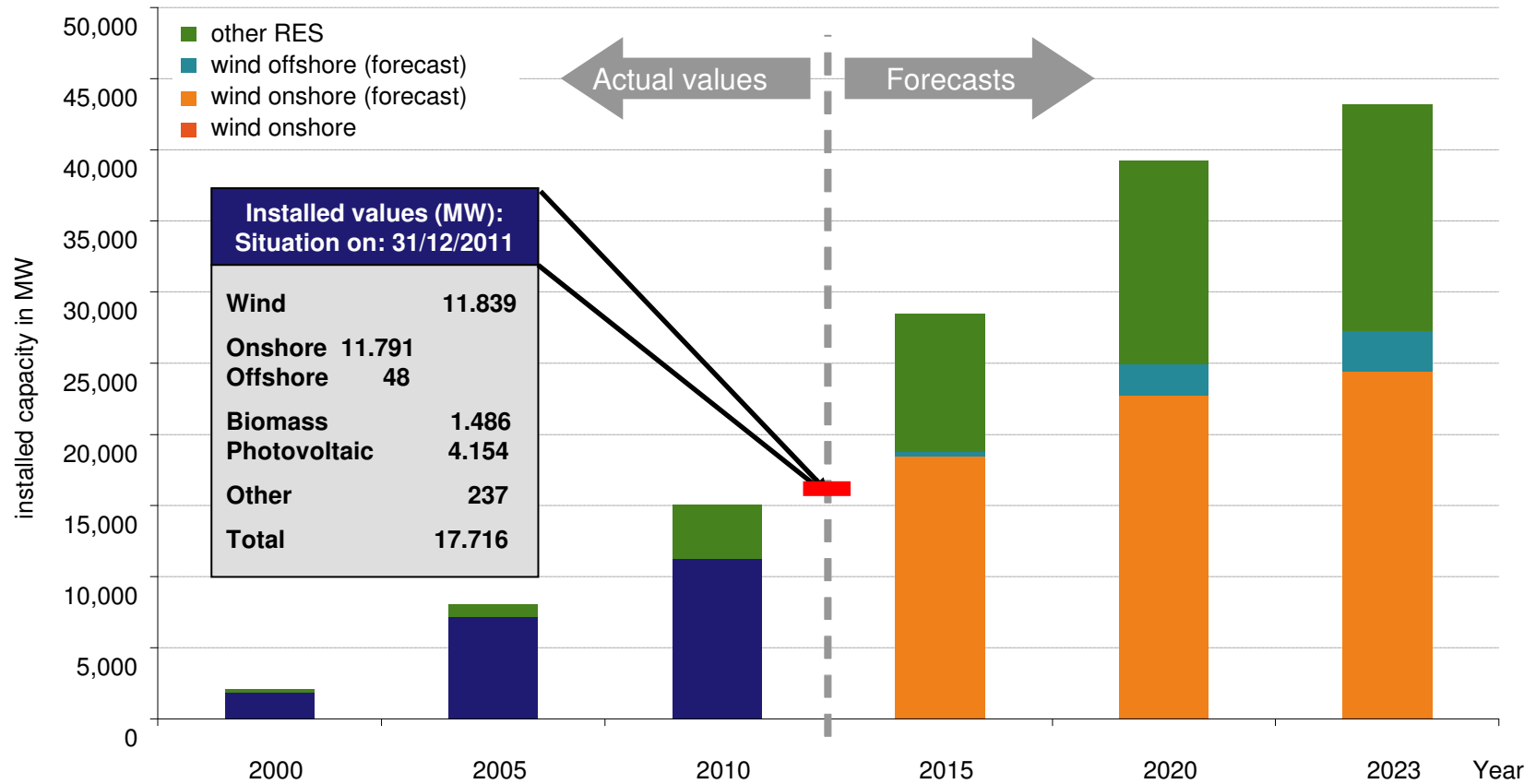
Thousands of small units



.. while more RES is coming on line fast



Example from one German area



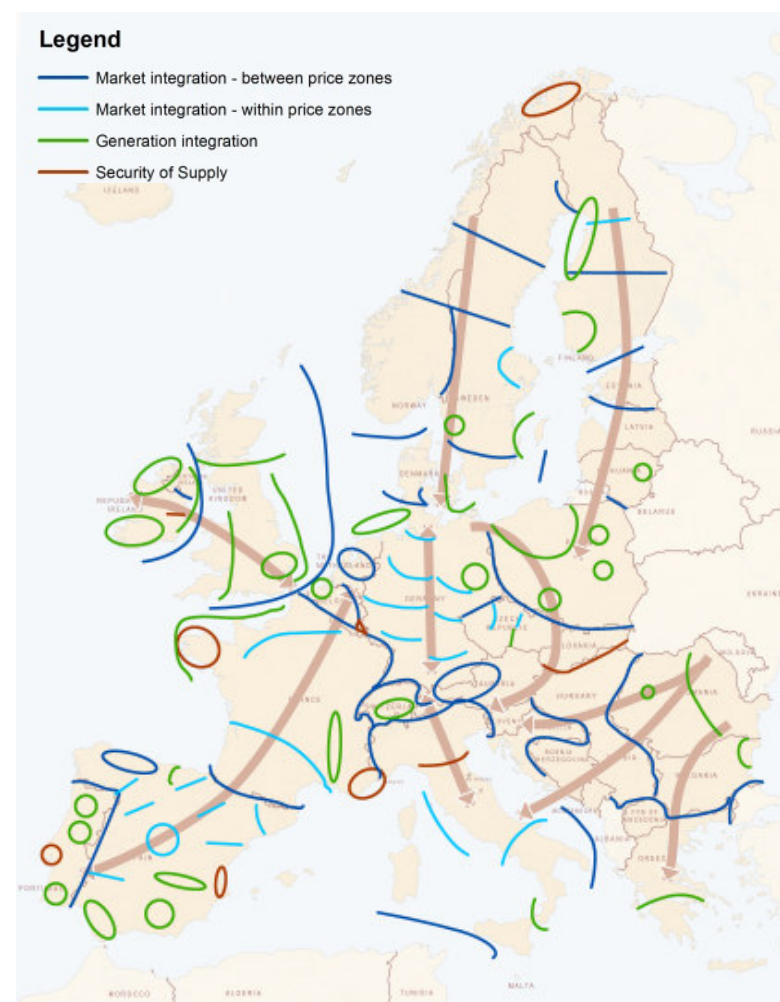
Data from 2000 to 2010 (actual): www.eeg-kwk.net of 13/12/2011

Data from 2015 to 2023 (forecast): EEG forecast 50Hertz Transmission, Situation in 2011

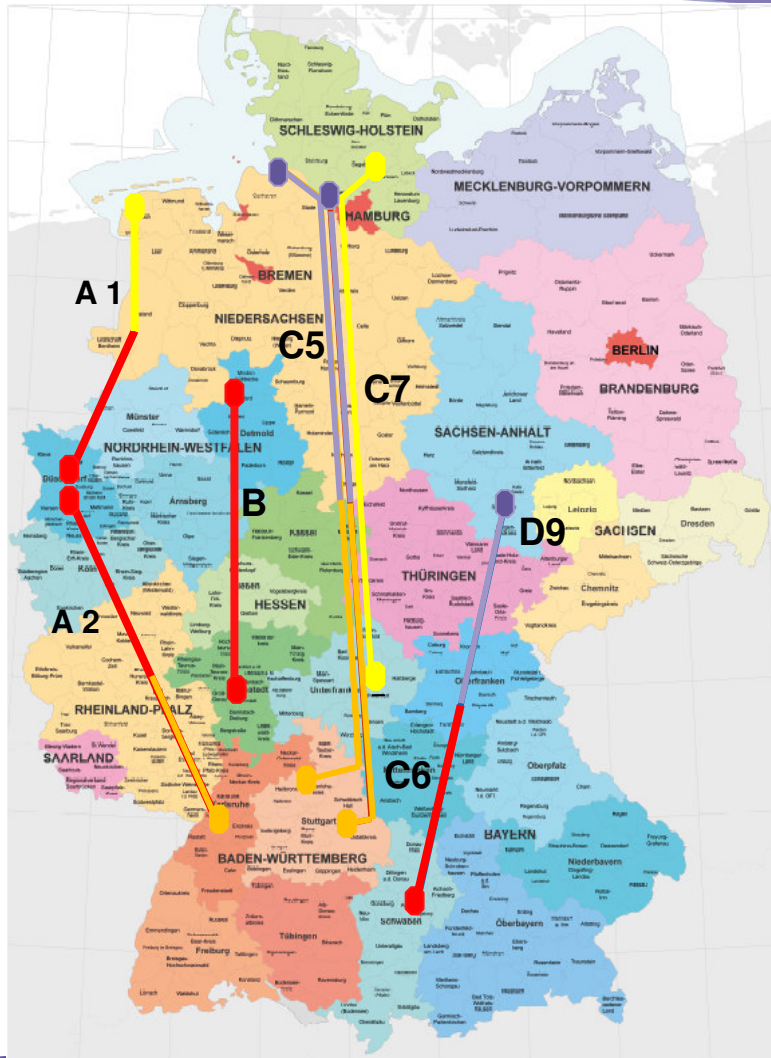
.. Implying more grid capacity ... with HVDC corridors

~€104 bn investments, to be compared with
≈ 2% of the bulk power prices and
less than 1% increase of end-users' E-bills

+1.3% per year grid length to match
a major shift in generation mix and
+3% p.a. of generation capacity growth

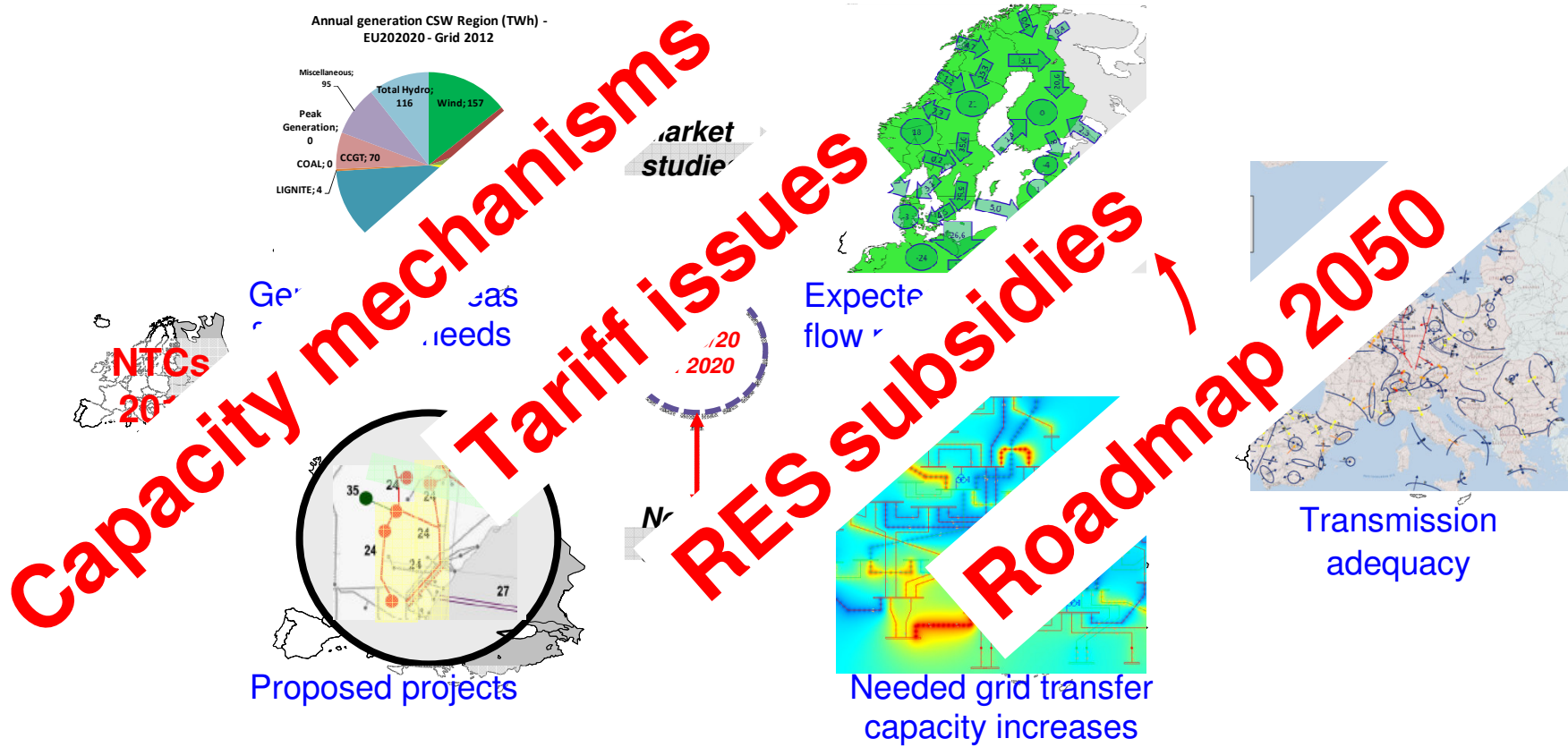


.. implying more grid capacity ... with HVDC corridors



... another game changer ...

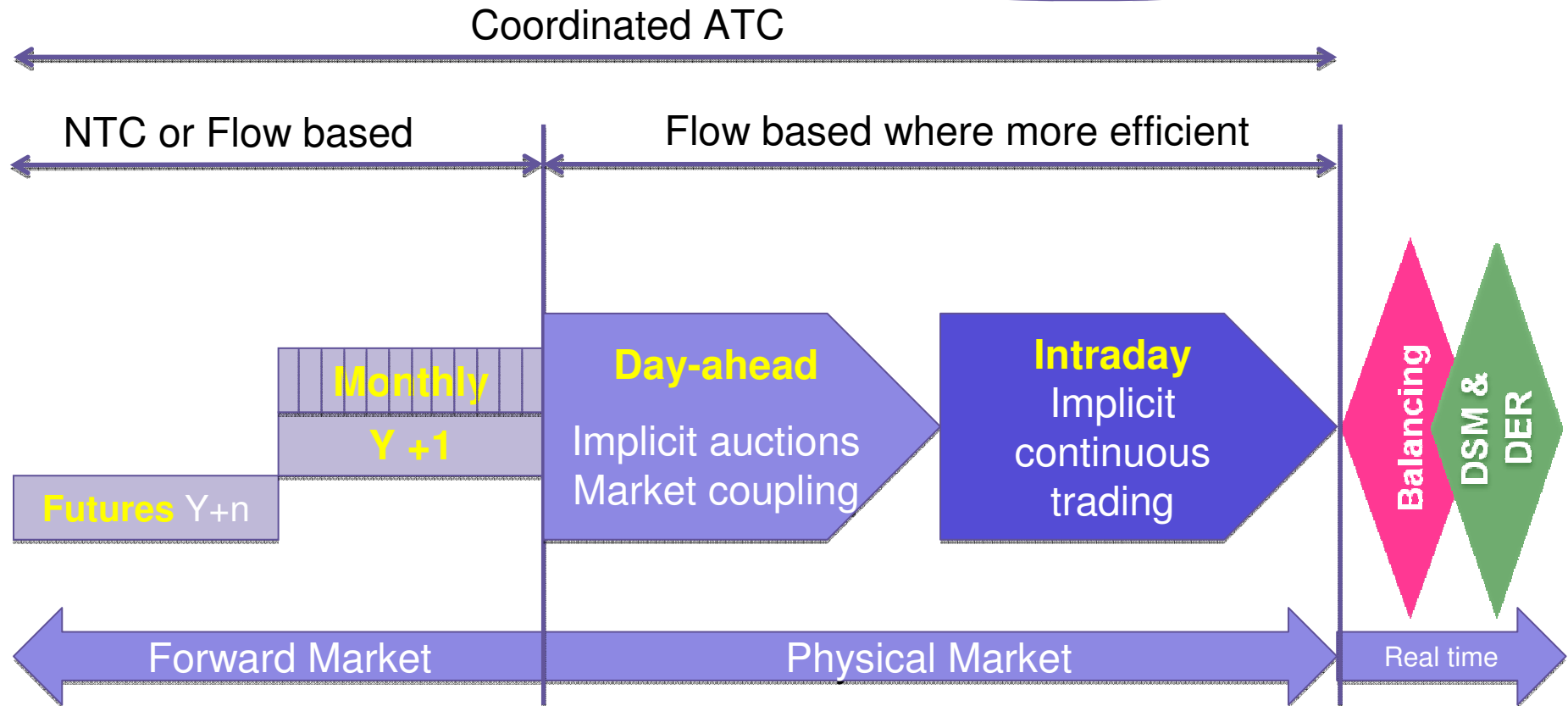
.. but tomorrow's grid = a moving target ... 2014 ... 2016 ...



Outline

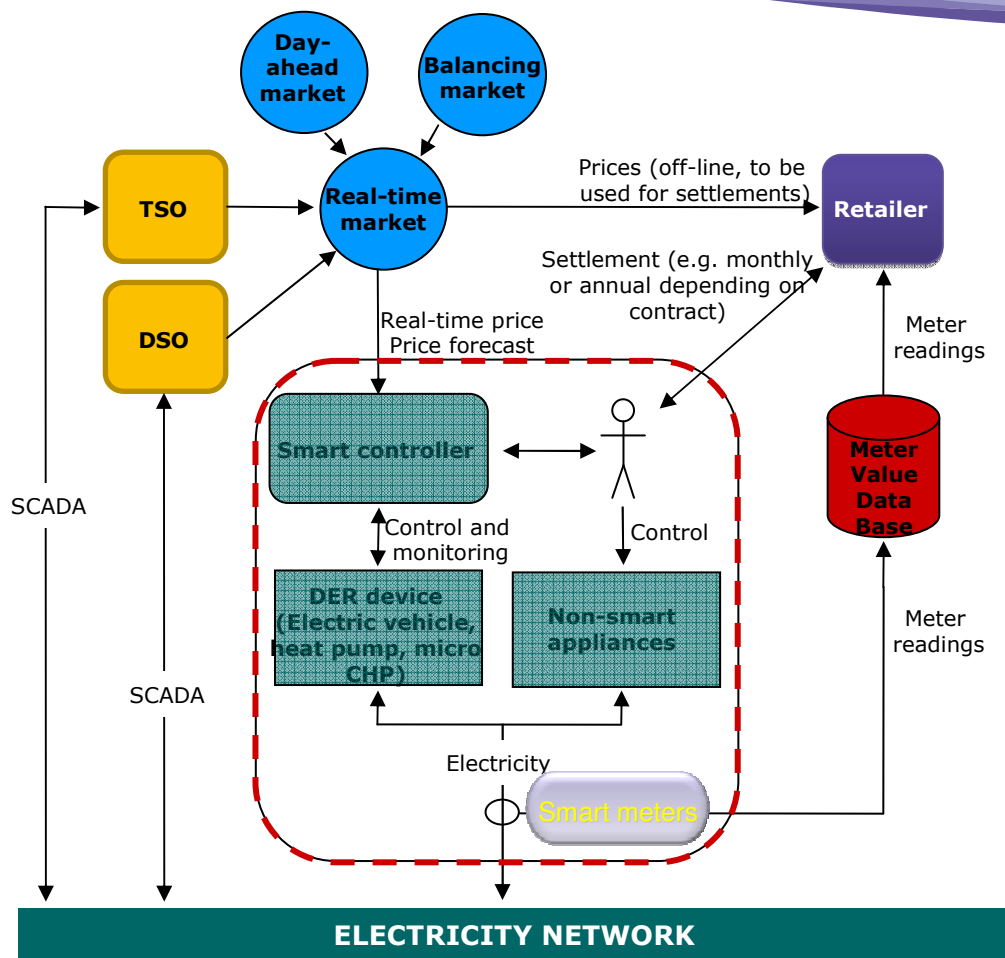
- ENTSO-E: role, membership, structure, ...
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 - **Software**
- Priorities ...
- Costs impact

a Common Market Model in .. 2014 !



But ... for the software to work ... a well functioning hardware is a prerequisite !

.. DSM & DER : are only smart meters needed to make it happen?



New market architecture:

- Installation of automatic end-user “smart controllers” in Distributed Energy Resources
- Smart Meters to manage “real-time” price signals
- Modern communication /information infrastructure to transmit price signal to market participants/ operational units

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A stable and attractive regulation looking forward !

Conclusions of the European Council 4 February 2011

“It is important to **streamline and improve authorisation procedures**, while respecting national competences and procedures, for the building of new infrastructure;”

“The bulk of the **important financing costs for infrastructure investments** will have to be delivered by the market, with **costs recovered through tariffs**. It is vital to promote a regulatory framework attractive to investment”.

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... Impact on TSO costs compared to RES support ?

“The extension of renewables into the system will entail significant costs above lower-cost alternatives for many years.

*IHS CERA finds that subsidy costs - supporting the legacy investments made before renewables costs reach cost-competitive levels - could **peak in 2020–30 at around €45–€60 billion per year.***

Subsidy supports are not expected to fall below today’s levels before 2035 at the earliest and could continue at high levels through to 2050. (...)

Although these costs are necessarily uncertain, it is clear that costs will be significant and likely in this range.”

“Sound Energy Policy for Europe”, IHS-CERA, July 2011

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