

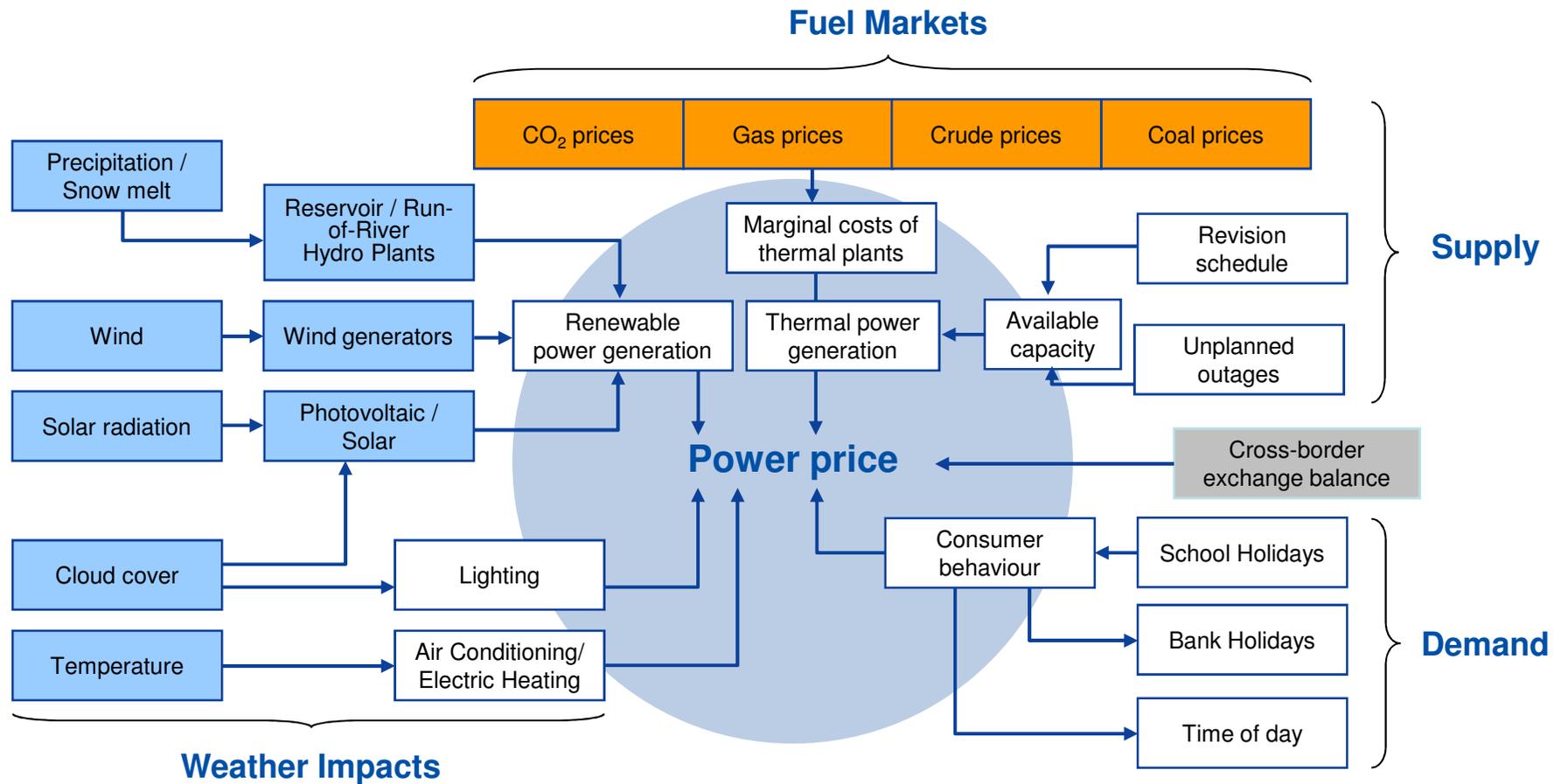
Challenges of Power Price Forecasting

9th Energy & Finance Conference, Essen

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Thomas Pieper, RWE Supply & Trading

Major fundamental factors influencing power prices on the wholesale market



These principles remain intact but interdependencies are becoming more complex and global ...

Challenges of Power Market Analysis

1. Analysis must go global !!!

Interdependencies with macroeconomics and global energy markets increasingly influence our local power and gas markets

2. Understand the neighbouring markets !!!

Crossborder effects become stronger among the European power markets.

3. Meteorology is essential !!!

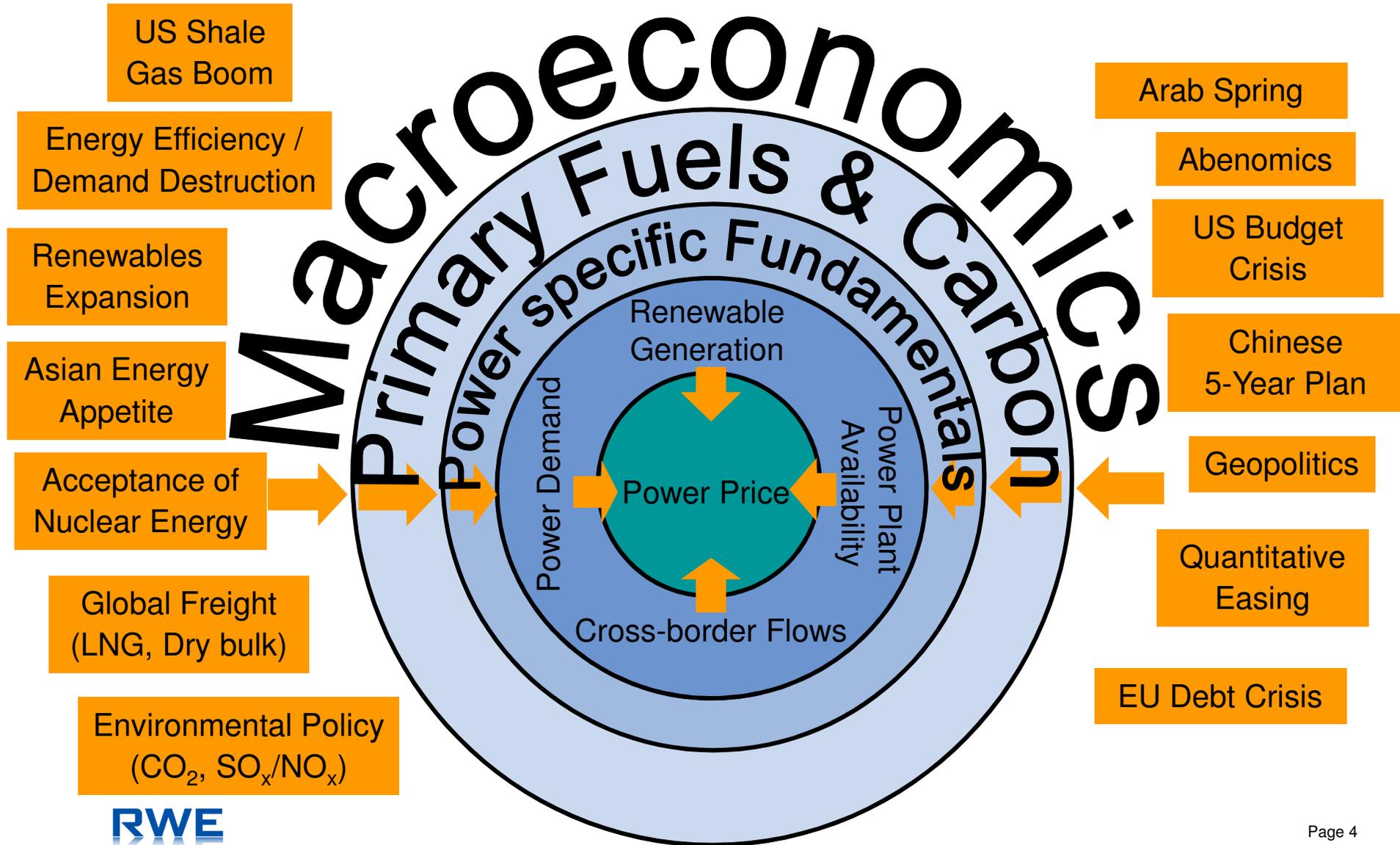
Weather impact is increasing.

4. Data mining remains key !!!

Data transparency is lagging behind.

1. Increasing Global Interdependencies

Global macro and global primary fuel developments increasingly influence our regional fuel and power markets



2.

Increasing Cross Border Dependency Germany is exporting weather and availability effects abroad and vice versa.

Export effects

- German PV and wind sensitivity (but renewables shut-in effect due to limited crossborder capacities)
- German nuclear availability (esp. nuke moratorium in March 11)

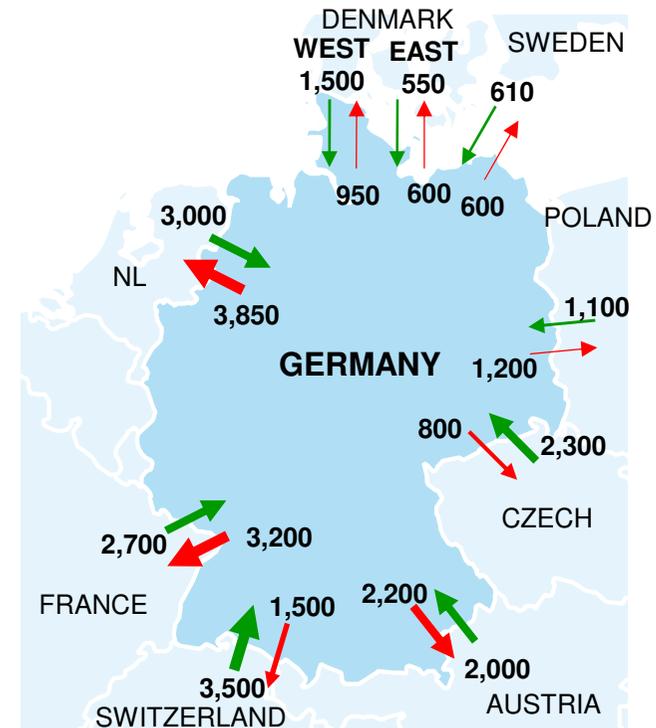
Import effects

- French temperature sensitivity
- French nuclear availability
- Nordic, Alpine and Balkan hydro sensitivity
- Dutch gas sensitivity (and further links to UK and Nordic via BritNed and NorNed cable)
- Increasing swing character of Polish and Czech border as well as Hungarian and Slovenian border via Austria (Hungarian and Czech nuke availability, hydro in Balkans)

Market Coupling will accelerate crossborder effects further

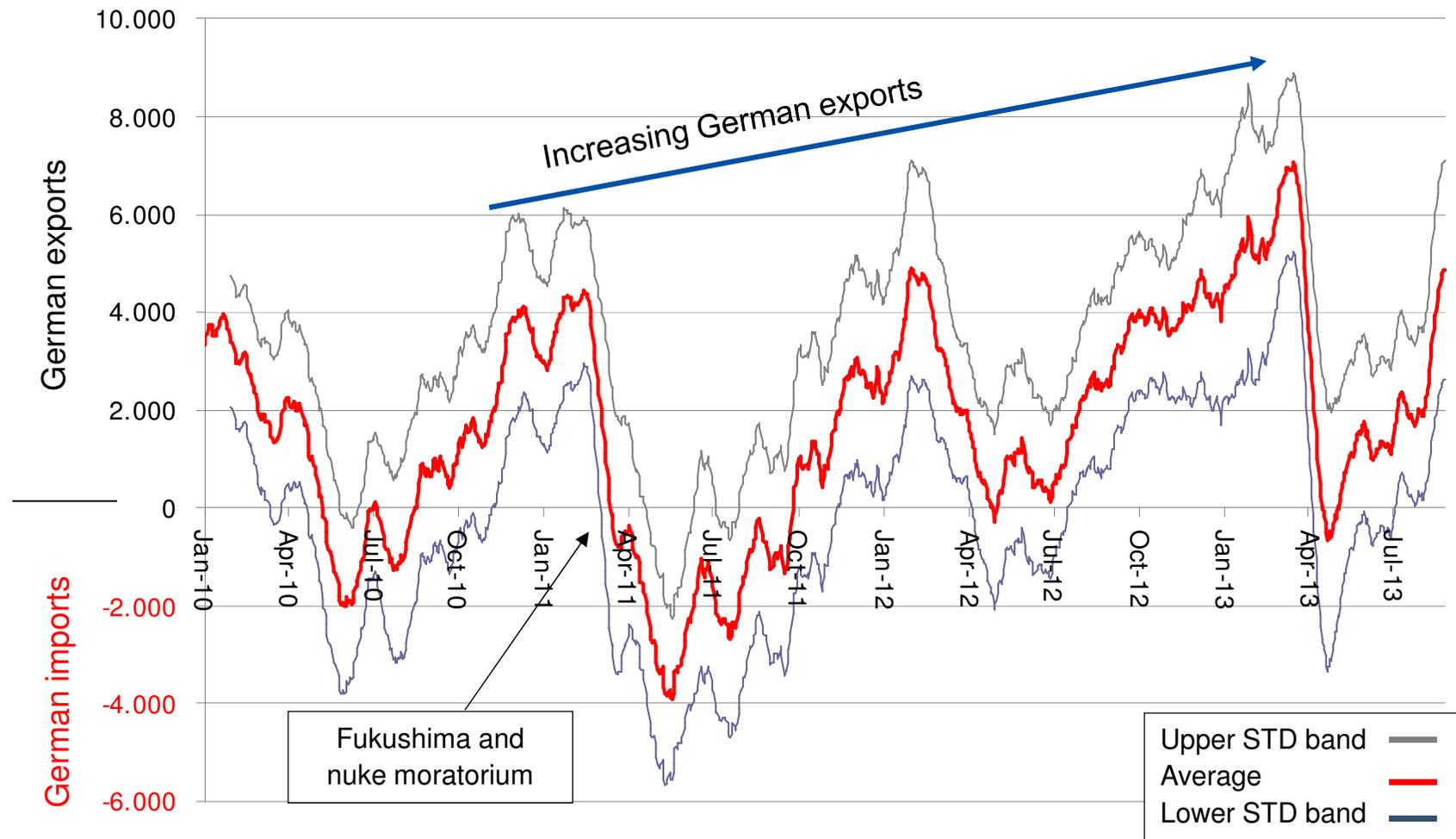
Net transfer capacity in MW

(Winter 2010/11)



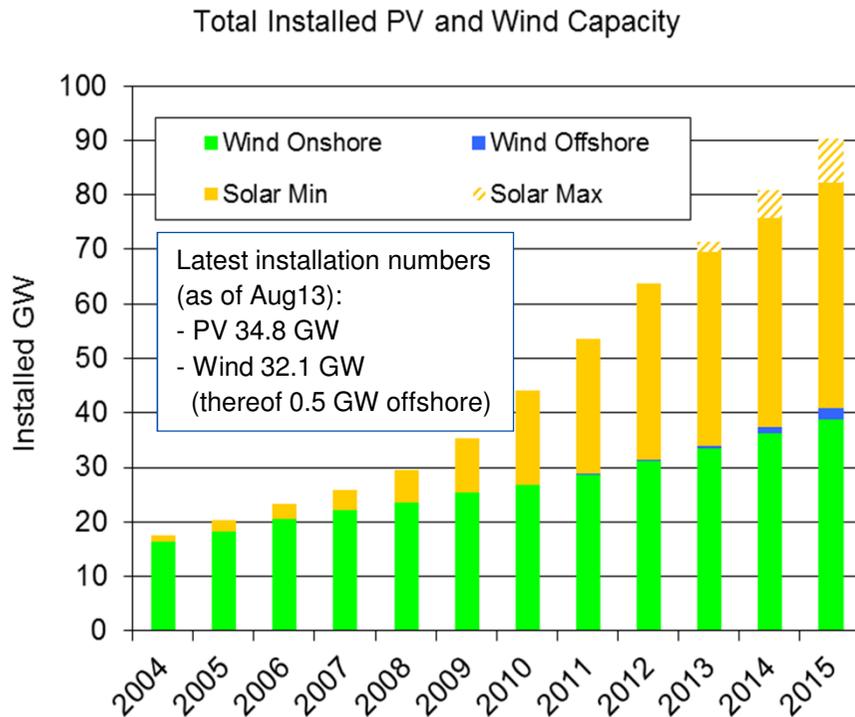
2. Development of German Crossborder Exchange Balance*: Increasing Exports with higher Volatility

30 day Moving Average Mean and Enveloping Standard Deviation (in MW)

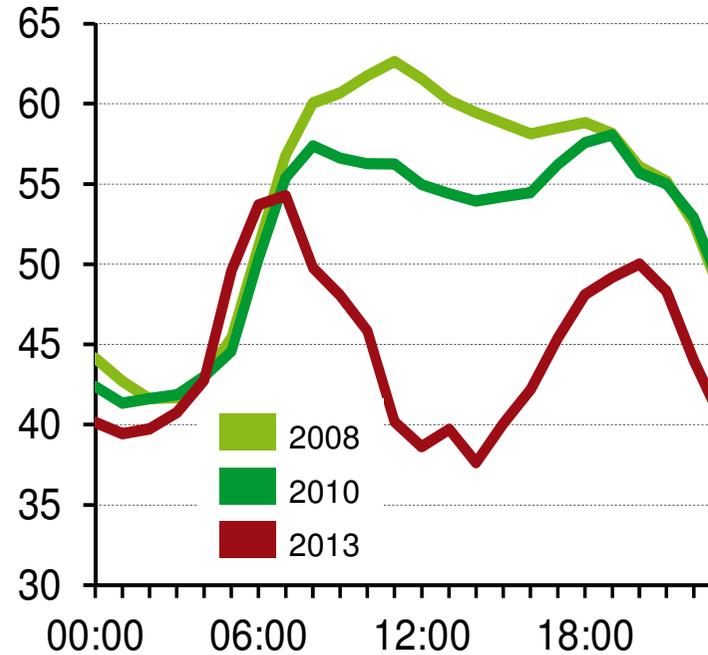


3.

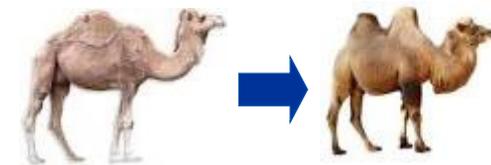
German renewable capacities continue to grow impacting residual demand and spot price.



Residual demand* for conventional electricity production
A Summer weekday in Germany, in GW



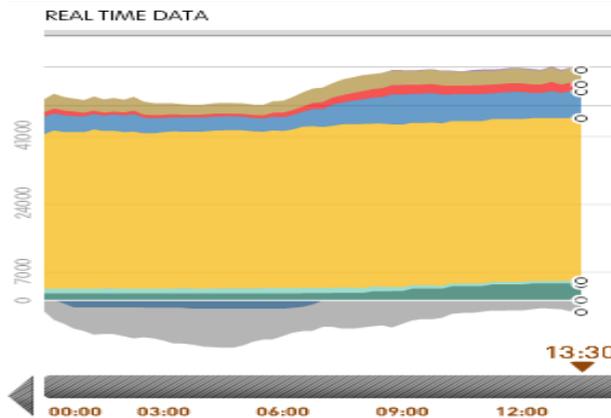
- German PV and wind installations account for 46% of installed capacity and 23% of generated power.
- Expected reform of the renewables law under the new German government causes major uncertainties regarding renewables capacity growth
- PV generation is driving down residual demand and spot price in sunshine hours: from “dromedary” to “camel” shape



4. Multiple disclosure requirements from various sources exist and are often discussed but not yet uniformly set

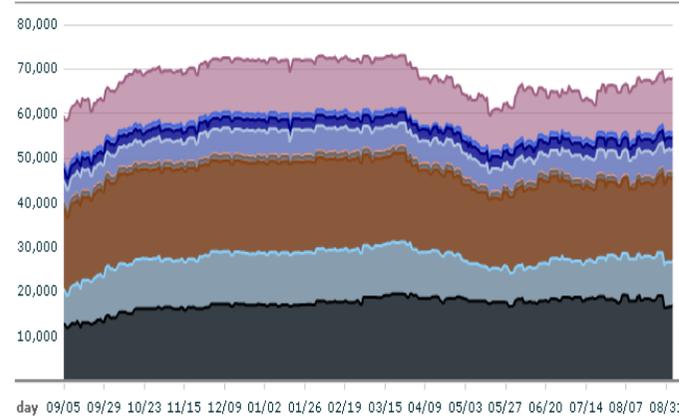
Legal Framework	Mainly EU Congestion Guideline, REMIT, “Markttransparenzstellengesetz” (Germany), EU Regulation 714/2009 and EU Directive 2003/6/EC
Legal Overlap	Overlapping in disclosure requirements for ex ante and post market data as part of the financial markets regulation and fraud control (e.g. EMIR, MIFID)
Associations & Authorities	ACER, ERGEG, Entso-E, EFET, Eurelectric, BNetzA, BKartA
Market	Power producers, TSOs and transparency platforms: e.g. RWE, Eon, EnBW, GdF Suez, RTE, Elia, EEX, Nordpool, EMFIP

RTE real-time electricity generation



1) Voluntary Commitment

EEX available generation capacity¹⁾



4.

”Quality before Quantity“

How to improve publication requirements of power plant data?

Current Status: Data Quality and IT Issues

- Data inconsistencies (definitions, granularity)
- Differing time horizons and completeness of published revision plans
- Missing of relevant plants or specific outage data
- Availability forecasts are too optimistic compared D-30 vs. D-1
- Non-timely publication of revision extensions and unplanned outages
- Handling data errors (double entries) and corrections
- Handling newbuild or mothballed capacities (test operations, etc.)
- Problems on tracking data updates and changes



Establish European-wide standards for power plant data

- A uniform transparency platform with consistent publications
- Publication of realistic capacity availabilities
- Identical data granularity and publishing frequency
- Ad-hoc announcements of unplanned power plant outages
- Publication of realistic and complete revision plans
- Solid and reliable data structure
- More focus regarding data corrections
- Clear labelling and consistent rules when correcting data
- Possibility of tracking events (outages, revisions, etc.)

