



Traders Dashboard

Breeze CEO, Jonas Corné
WindSim User Meeting 2015



Agenda

- Breeze mission and what it means to our customers
- Nordic Power Market
- Data Input for Traders Dashboard
- Traders Dashboard
- Trend towards spot market



Breeze Mission

Make renewable energy cheaper for the consumer
and more profitable for the owner



To our customers that means Breeze software needs to help them

Convert more wind
into energy

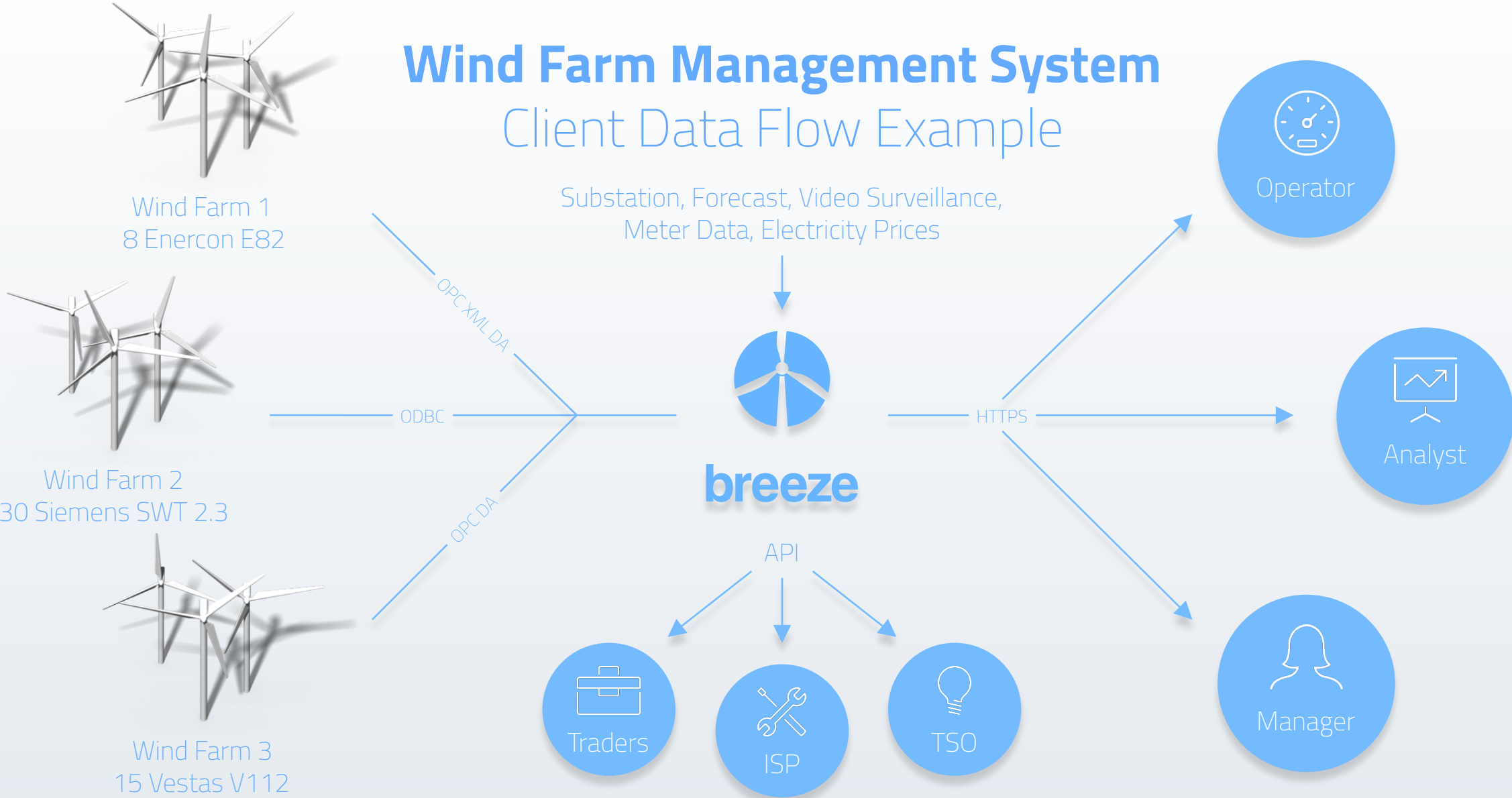
Identify underperformance
Maintenance scheduling
OEM availability negotiations
etc

Get paid more per
MWh

Today's Focus

Wind Farm Management System

Client Data Flow Example



Nordic Power Market

ELSPOT

Regulating
Price

ELBAS

Nordic Power Market : Day Ahead ELSPOT

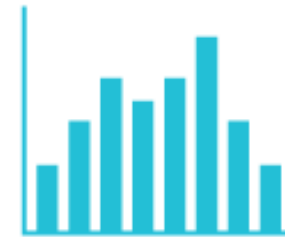
08:00-12:00

Buyers and sellers enter their bids and offers into the trading system



12:00-13:00

Based on orders and transmission capacity, prices for the North-Western European region are calculated simultaneously using the common European algorithm. Prices are calculated for each hour of the day



07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00



Until 10:00

Power transmission capacities are given by the system operators to each bidding area in the market



Until 12:00

Buyers plan how much power they will need and sellers, how much they can provide.

12:00



Auction closes

12:42



The prices are announced to the market

13:00-15:00

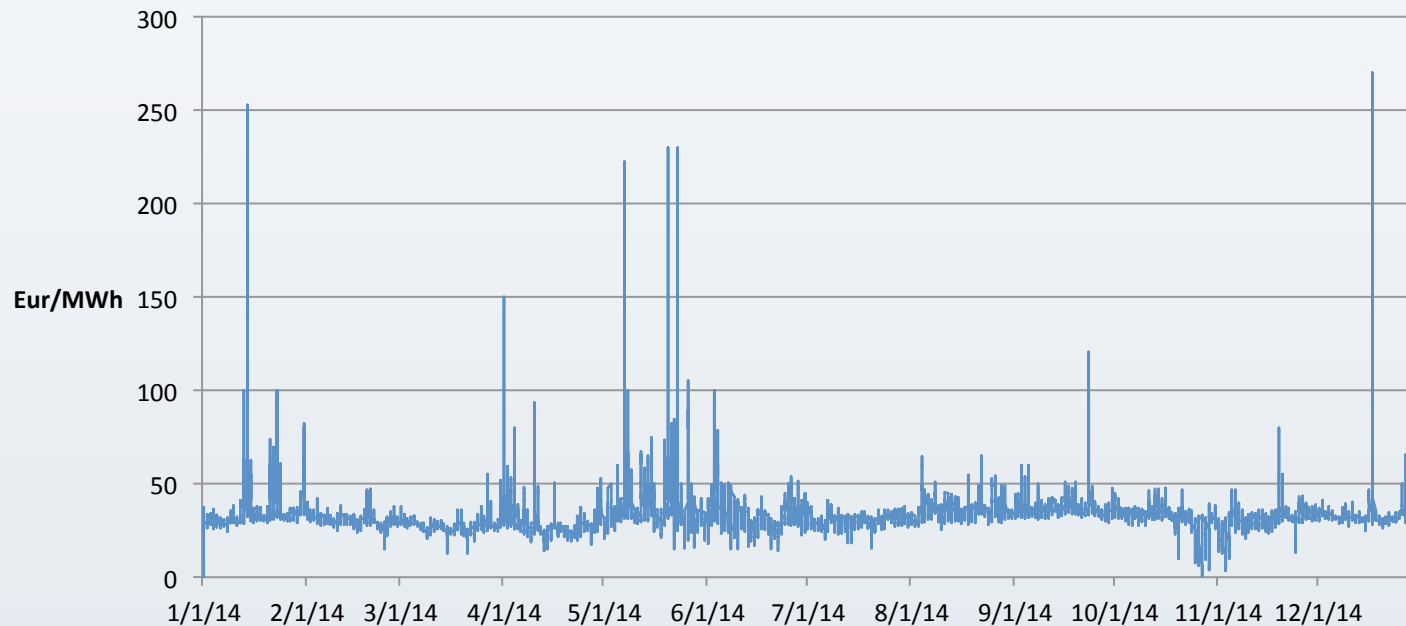


Trades are invoiced between buyers and sellers

Sometimes Forecasts are not Correct

→ Enter Regulatory Market

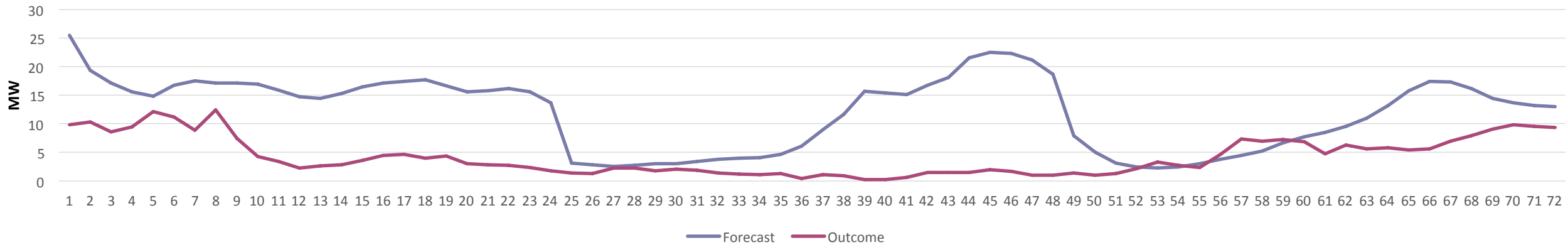
Regulating prices in EUR/MWh SE1 2014



Drivers of regulatory price changes

- Hydrology – reservoir levels and inflow
- Temperature
- Wind
- Nuclear availability
- CO2 allowance and fuel price
- Congestion

Forecast vs Outcome 27-29/12-2014

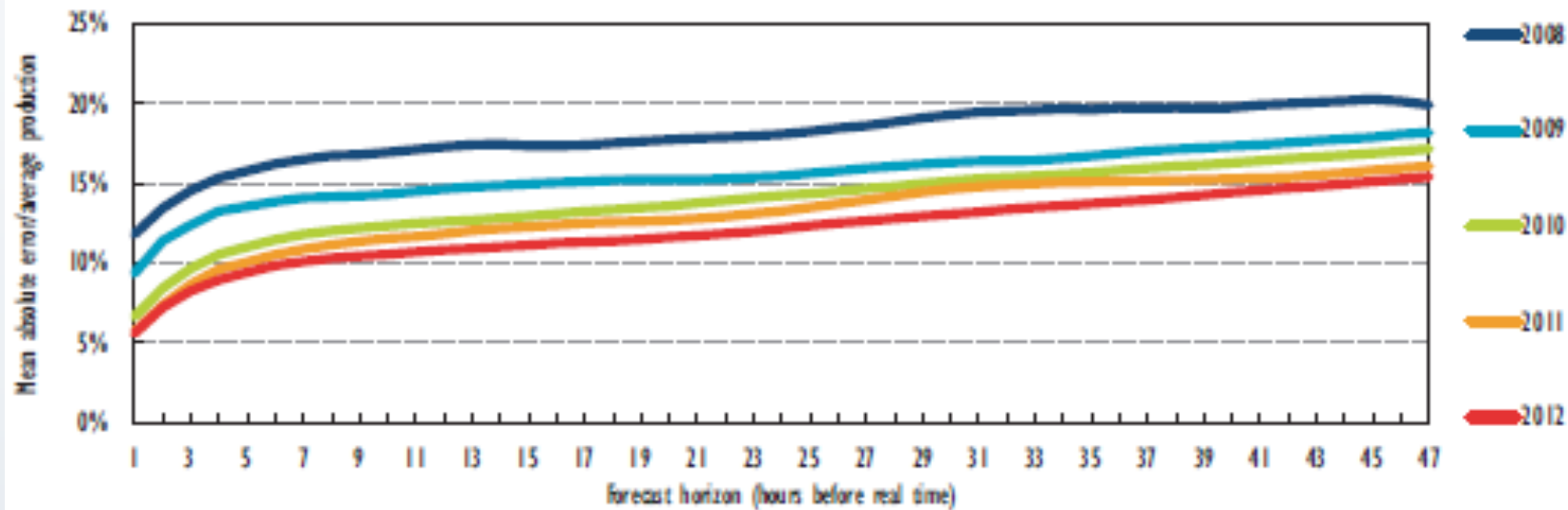


ELSPOT price vs Regulating Price



Forecast quality has been improving 5-7% every other year (data from 2008-2012)

Figure 2.9 • Improvement in wind power forecasts in Spain, 2008-12



Source: based on data from Red Eléctrica de España.

Key point • Wind power forecasts have improved over recent years. Forecasts looking ahead only a few hours are more accurate than day-ahead forecasts.



Active traders can make more money by being proactive on intraday market

→ Enter ELBAS

- Risk reduction and increased profit
- Around the clock trading until one hour before delivery

Profit

=

Tradable Volume

x

(ELBAS Price – Regulatory Price)

Data Input to Traders Dashboard

Data	Source	Update frequency
Real-time power	Wind Farms	Real-time
Production forecast next 36 hours	Forecast provider	Hourly
Day-ahead : Hourly spot market Power price	Nordpool	Daily
Regulatory price	Nordpool	Hourly (2h delay)
Intraday : ELBAS price	Nordpool	Hourly



Traders Dashboard

Conceptual Design

Future Trading Opportunities

Action	Time	Time Left	Subm. Forecast	Upd. Forecast	Diff.	Elbas Price	Elbas Value	Certainty	
BUY	June 17 23:00	2 hours	41 MWh	34 MWh	-7 MWh	6.74 €/MWh	674 €	High	COMMIT
SOLD	June 18 02:00	5 hours	32 MWh	37 MWh	+5 MWh	4.81 €/MWh	481 €	High	UNDO
SELL	June 18 05:00	8 hours	42 MWh	45 MWh	+3 MWh	6.16 €/MWh	616 €	Medium	COMMIT
SELL	June 18 06:00	9 hours	22 MWh	30 MWh	+8 MWh	8.11 €/MWh	811 €	Low	COMMIT
BUY	June 18 08:00	11 hours	64 MWh	62 MWh	-2 MWh	2.10 €/MWh	210 €	Low	COMMIT

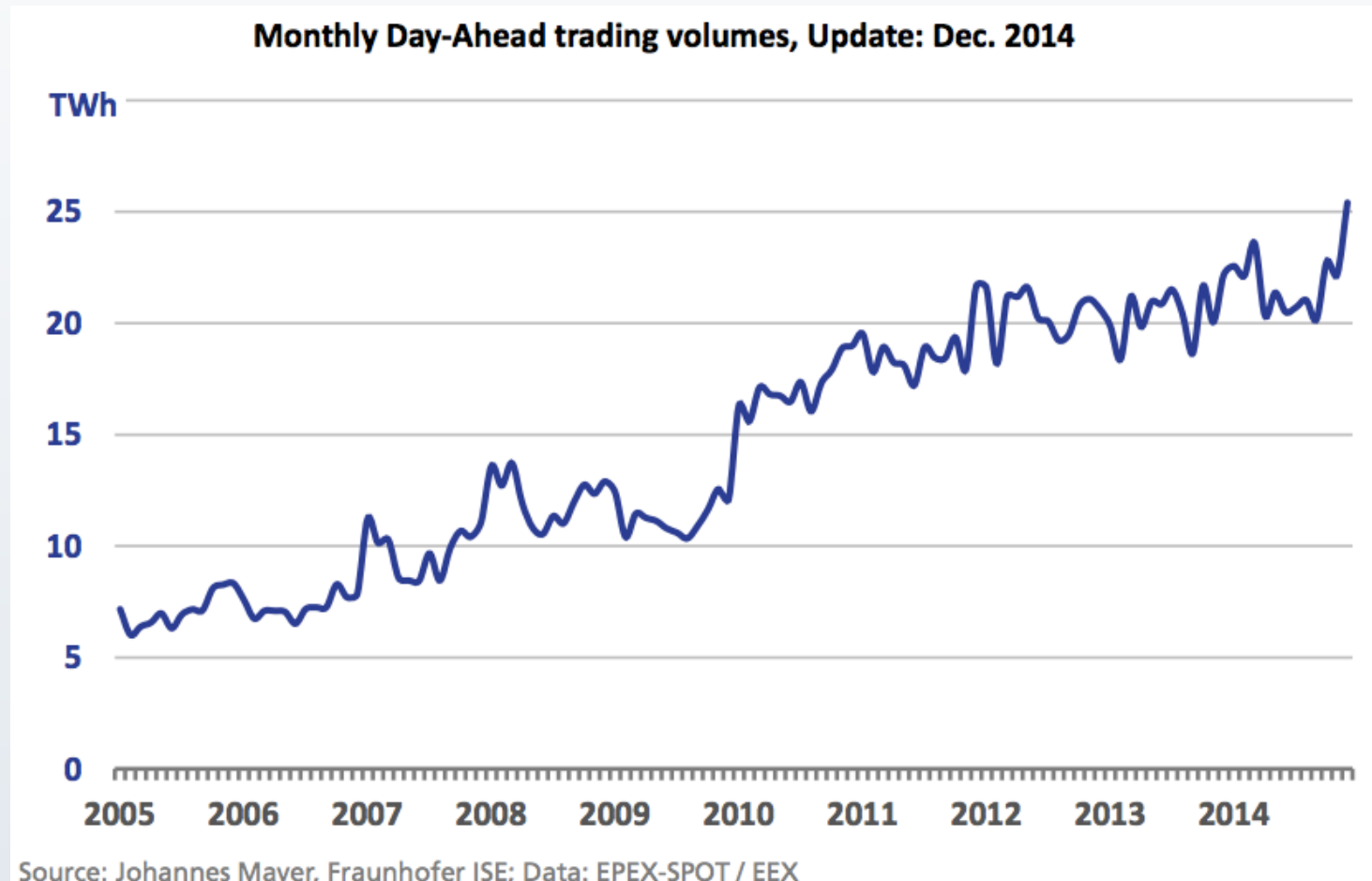
Last Day's Elbas Trading Opportunities vs. Regulating Price, €/MWh



Last Day's Trading Opportunities

Action	Time	Time Ago	Elspot Forecast	Prod. Outcome	Diff.	Elbas Price	Regul. Price	Price Diff.	Elbas Value	Regul. Value	Value Diff.	
SOLD	June 17 16:00	6 hours	32 MWh	34 MWh	+2 MWh	€7.0/MWh	€6.50/MWh	+€0.50	€700	€650	+€50	UNDO
BUY	June 17 15:00	7 hours	32 MWh	36 MWh	-4 MWh	€5.75/MWh	€5.50/MWh	+€0.25	€575	€550	+€25	COMMIT
BOUGHT	June 17 12:00	10 hours	45 MWh	42 MWh	-3 MWh	€7.12/MWh	€7.92/MWh	-€0.80	€712	€792	-€80	UNDO
BOUGHT	June 17 10:00	12 hours	22 MWh	21 MWh	-1 MWh	€1.25/MWh	€1.45/MWh	-€0.20	€125	€145	-€20	UNDO

More intermittent energy supply drives trades on spot markets



Further Reading

- <http://www.nordicenergyregulators.org/wp-content/uploads/2014/06/Nordic-Market-Report-2014.pdf>



breeze

www.breezesystem.com