

Trayport Euro Commodities Report

Trayport Analysis Team
May 2018

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Editorial summary

Volumes up across the board MoM, mixed performance YTD. TTF remains strong, exchange executions break 40% market share in Coal.

May 2018 saw 8.408 million monthly contracts traded, up 22% MoM following a low April. All groups rose vs April, with UK Power the highest, recording a 31% MoM increase. Euro Gas, UK Gas and Euro Power also saw noticeable increases at 26%, 25% and 23% respectively. YTD we have seen 38.605 million monthly contracts traded, up 9% vs YTD 2017. This was driven by Euro Gas up 21% YTD and Emissions up 53%, Euro Power was even YTD, whilst UK Power, UK Gas and Coal all recorded declines.

Euro Gas saw its strong year continue, up 21%, recording its third highest month (since Jan-11). TTF recorded its second highest month ever with 2,376 TWh, 114 TWh behind the record set in March 2018. Exchange execution drove the TTF volumes taking 3% market share from both broker bilateral (-2%) and broker cleared (-1%). YTD TTF's volume stands at 170% of NBP volume, up from 118% this time last year. MoM growth was seen in five of the seven commodities, as ZEE and France Hubs saw the only declines, down 20% and 6% respectively. PSV saw a 44% MoM increase, recording the third highest volume since Jan-11 at 95 TWh. Front Month NBP and TTF prices continued to rise MoM, up 8% and 10% respectively. With inventories dropping to a five year low following the bitterly cold winter, what can we expect of prices through the rest of the year?

All commodities in the Euro Power grouping saw both MoM and YoY increases. The smaller commodities are all showing growth however Nordic Power and German Power's slow start to the year means that YTD Euro Power is even vs. YTD 2017. Standouts were Italian Power, Belgian Power and Spanish Power, up 61%, 47% and 41% MoM respectively. Much of this MoM growth was driven by broker bilateral, with seven of the nine Power commodities showing increases (German Power and Nordic Power both saw gains in broker cleared). UK Power recorded MoM growth driven by broker bilateral's 5% gain in market share, however total volume remains down 10% YTD.

Coal saw MoM increases in all three commodities with exchange executions being the main beneficiary, gaining 7% market share and breaking through 40% market share barrier (42% exchange executed /58% broker cleared). Will exchange executions become the majority market share holder in 2018? ICE showed gains in cleared market share, up 4% to 80% vs CME. Front month prices of API2 rose 12% MoM to \$95 per tonne.

Emissions continued to grow, up 1% MoM, with broker bilateral taking a sizeable hit in market share, down 15% to 2%, primarily at the benefit of broker cleared.

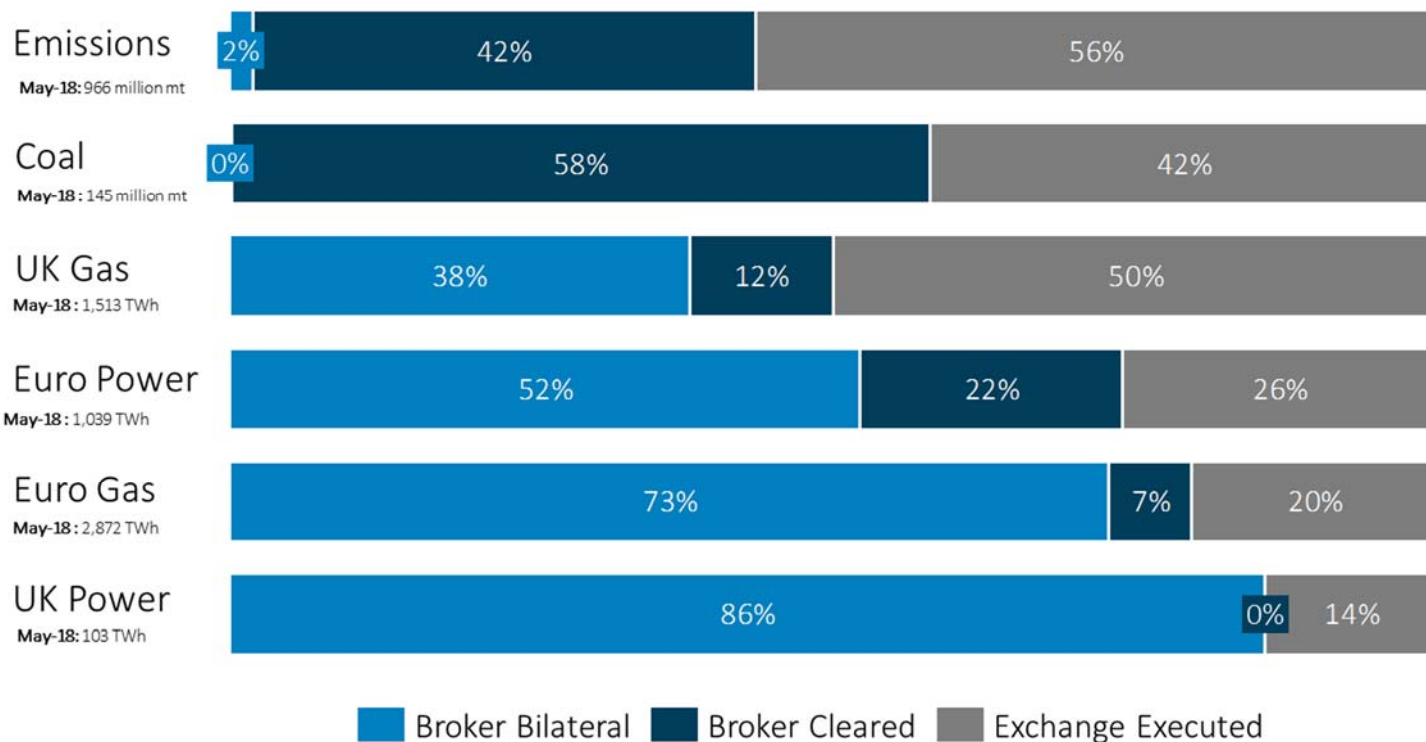
| | Growth | | Current Month Market Share | | | Exchange volume | | |
|------------------|--------|--------|----------------------------|----------------|-------------------|-----------------|------------|--------|
| | Growth | Metric | Broker Bilateral | Broker Cleared | Exchange Executed | Auction | Continuous | Total |
| Gas | | | TWh | | | | | |
| NBP | 25% | MoM | 38% | 13% | 50% | - | 753.35 | 753.35 |
| TTF | 27% | MoM | 70% | 9% | 22% | - | 524.69 | 524.69 |
| NCG | 32% | MoM | 88% | 0% | 12% | - | 17.95 | 17.95 |
| Gaspool | 22% | MoM | 87% | 1% | 12% | - | 11.62 | 11.62 |
| France Hubs | -6% | MoM | 63% | 0% | 36% | - | 14.35 | 14.35 |
| Austria VTP | 60% | MoM | 83% | 0% | 17% | - | 11.08 | 11.08 |
| PSV | 44% | MoM | 97% | 1% | 2% | - | 2.23 | 2.23 |
| ZEE | -20% | MoM | 99% | 0% | 1% | - | 0.52 | 0.52 |
| Power | | | TWh | | | | | |
| UK Power | 31% | MoM | 86% | 0% | 14% | 13.19 | 1.64 | 14.82 |
| German Power | 20% | MoM | 67% | 14% | 19% | 20.06 | 99.80 | 119.87 |
| French Power | 11% | MoM | 60% | 12% | 28% | 11.34 | 10.33 | 21.67 |
| Nordic Power | 28% | MoM | 0% | 44% | 56% | - | 73.28 | 73.28 |
| Italian Power | 61% | MoM | 20% | 62% | 18% | - | 13.15 | 13.15 |
| Spanish Power | 40% | MoM | 25% | 68% | 7% | - | 1.20 | 1.20 |
| CEE Power | 23% | MoM | 46% | 13% | 42% | - | 25.08 | 25.08 |
| Dutch Power | 17% | MoM | 57% | 9% | 35% | 3.95 | 9.36 | 13.30 |
| Belgian Power | 47% | MoM | 62% | 3% | 35% | 2.17 | 2.07 | 4.24 |
| Coal | | | MMT | | | | | |
| API2 | 15% | MoM | 0% | 51% | 49% | - | 56.27 | 56.27 |
| API 4 | 22% | MoM | 0% | 81% | 19% | - | 1.79 | 1.79 |
| gC NEWC | 15% | MoM | 2% | 85% | 14% | - | 2.85 | 2.85 |
| Emissions | | | MMT | | | | | |
| EUA | 1% | MoM | 2% | 41% | 56% | 68.43 | 476.74 | 545.17 |
| CER | -99% | MoM | 0% | 0% | 100% | - | 0.00 | 0.48 |

European Energy Markets Composition: Broker Bilateral, Broker Cleared and Exchange Execution

Information as at: 31 May 2018

Estimates based on Trayport analysis and market research

May 2018



Note: Data sources on page 11.

Table 1: Key Term Definitions

| Term | Definition | Calculation |
|--------------------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Broker Bilateral | Total volume executed at a broker and settled bilaterally, without the involvement of a clearinghouse | LEBA published total volume minus LEBA published cleared volume |
| Broker Cleared | Total volume executed at a broker or off-exchange and given up for clearing to a clearinghouse | Aggregated clearinghouse reported broker cleared volume |
| Exchange Execution | Total volume executed directly on exchange and cleared with the relevant clearinghouse | Aggregated exchange reported executed volume |
| Cleared Market | Total volume cleared at a clearinghouse | Broker cleared plus exchange execution |
| Total Execution | Total executed volume, at a broker or an exchange | Broker bilateral plus broker cleared plus exchange executed |

European Energy Markets Composition: YTD Trends

Information as at: 31 May 2018

Estimates based on Trayport analysis and market research

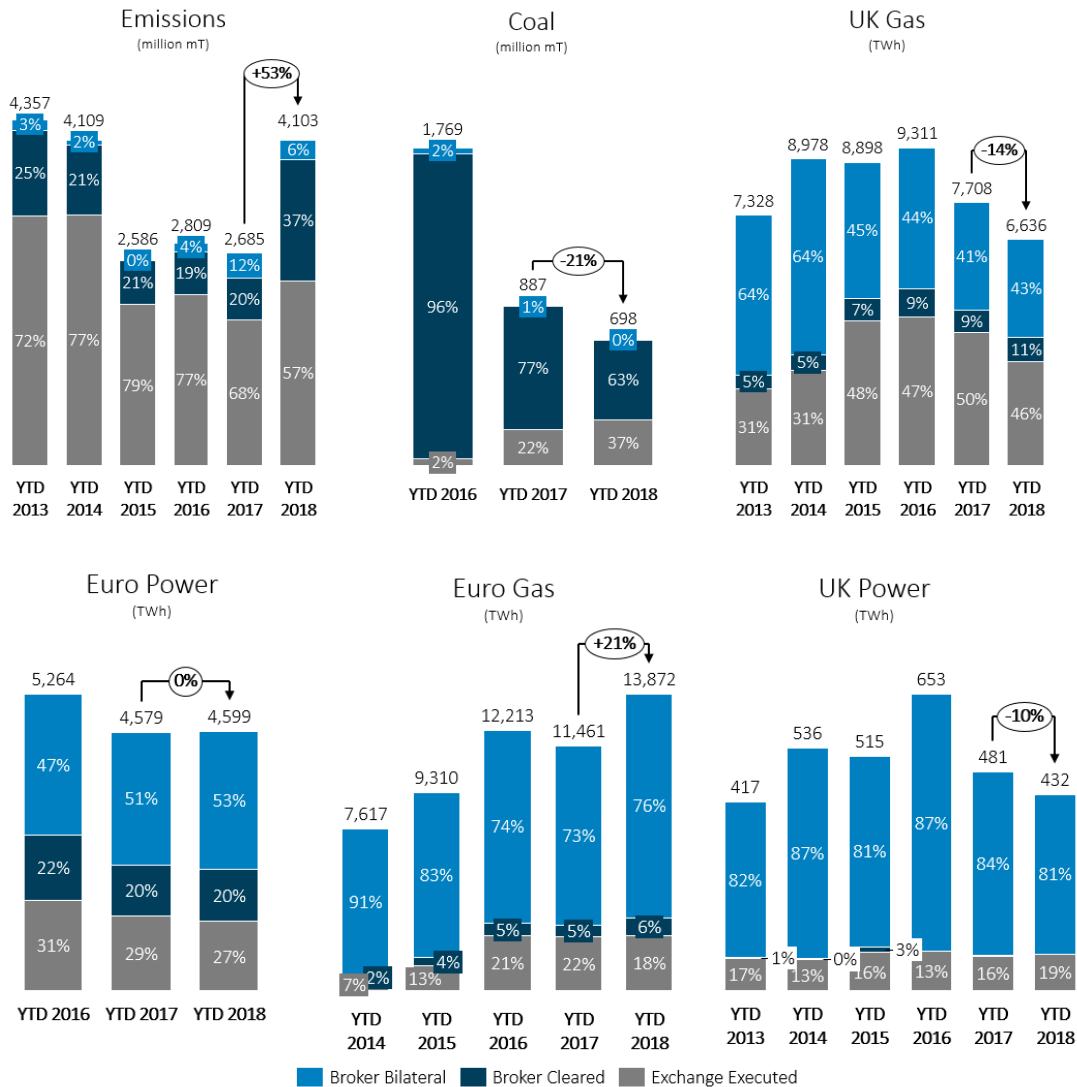


Table 2: Volume Traded Change

| Commodity Class | MoM | YoY | YTD | Term | Definition |
|-----------------|-----|------|------|------|----------------------------------------------------------------------------------------------|
| Emissions | 1% | 77% | 53% | | |
| Coal | 16% | -30% | -21% | MoM | Current month volume versus previous month volume (e.g. October 2012 vs. September 2012) |
| UK Gas | 25% | 0% | -14% | | |
| Euro Power | 23% | 13% | 0% | YoY | Current month volume versus same month last year volume |
| Euro Gas | 26% | 39% | 21% | | |
| UK Power | 31% | 26% | -10% | YTD | Total volume YTD 2014 versus total volume YTD 2013 (e.g., Jan – Oct 2014 vs. Jan – Oct 2013) |

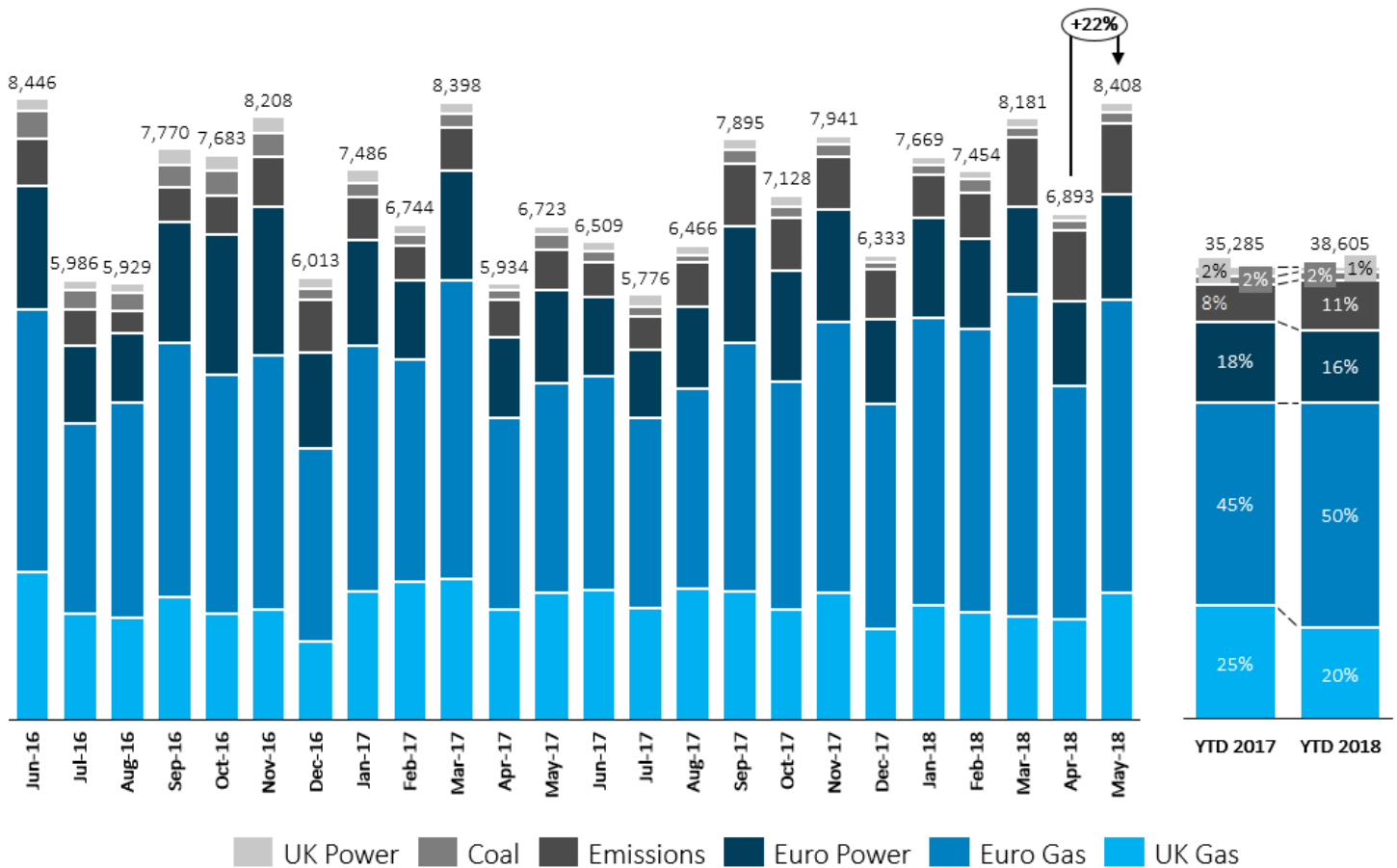
Note: Data sources on page 11.

European Energy Markets Composition: Total Euro Commodity Market Volumes

Information as at: 31 May 2018

Estimates based on Trayport analysis and market research

(Monthly Contract Equivalents* 000's)



Note: Data sources on page 11.

*Monthly Contract Equivalents calculated as total volume divided by a standard monthly contract lot size (30 day month):

| Commodity Class | Volume Unit | Standard Monthly Contract Lot Size | Monthly Contract Equivalent Calculation |
|-----------------|---------------|------------------------------------|-------------------------------------------------------|
| Emissions | Metric tonnes | 1,000 tonnes | Total volume in metric tonnes divided by 1,000 tonnes |
| Coal | Metric tonnes | 1,000 tonnes | Total volume in metric tonnes divided by 1,000 tonnes |
| UK Gas | Therms / MWh | 30,000 therms / 879 MWh | Total volume in MWh divided by 879 MWh |
| Euro Power | MWh | 720 MWh | Total volume in MWh divided by 720 MWh |
| UK Power | MWh | 720 MWh | Total volume in MWh divided by 720 MWh |
| Euro Gas | MWh | 720 MWh | Total volume in MWh divided by 720 MWh |

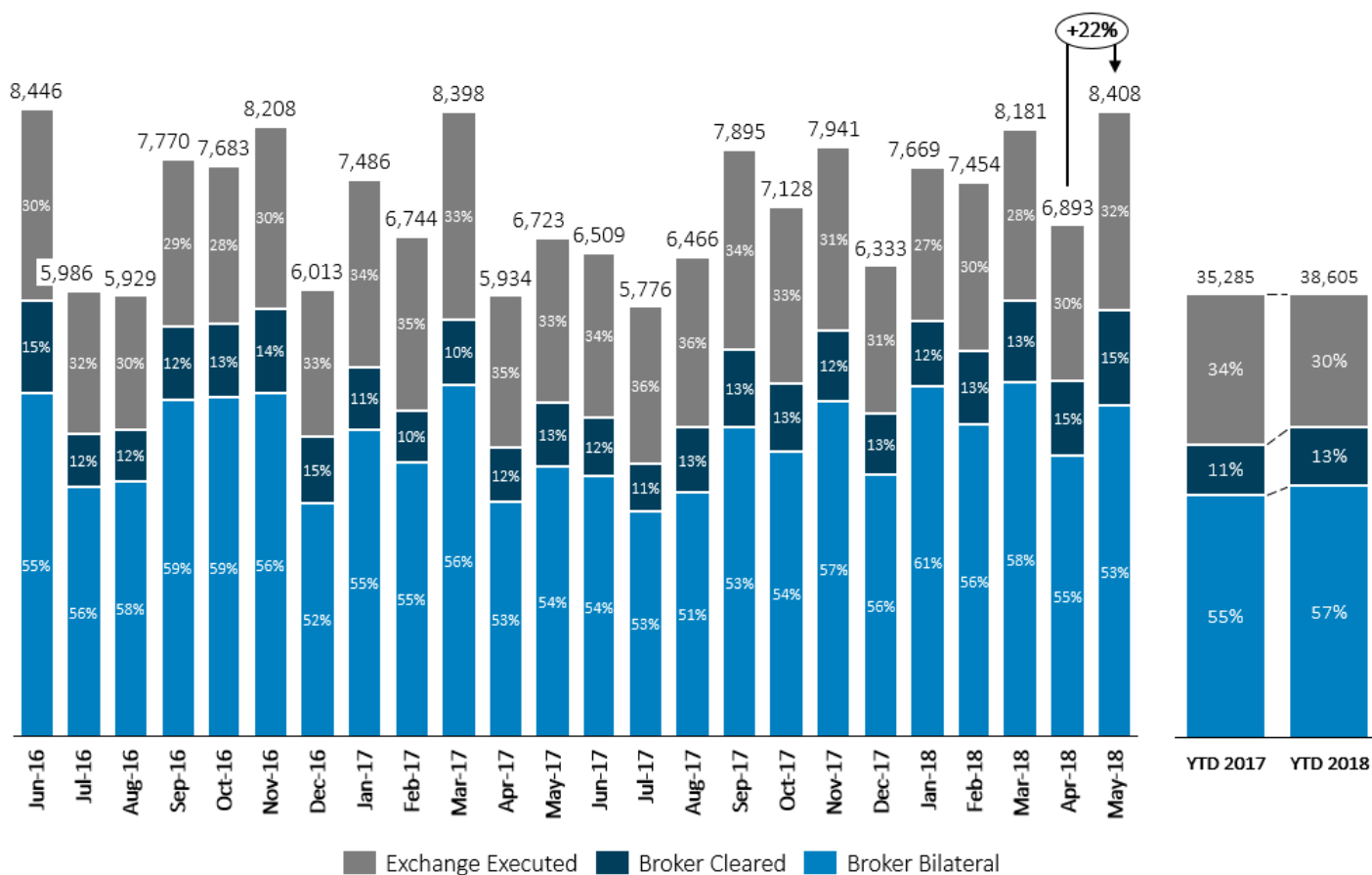
Monthly Contract Equivalents allow us to compare trading volumes across commodity classes that are traded in different volume units.

European Energy Markets Composition: Total Euro Commodity Market Volumes

Information as at: 31 May 2018

Estimates based on Trayport analysis and market research

(Monthly Contract Equivalents* 000's)



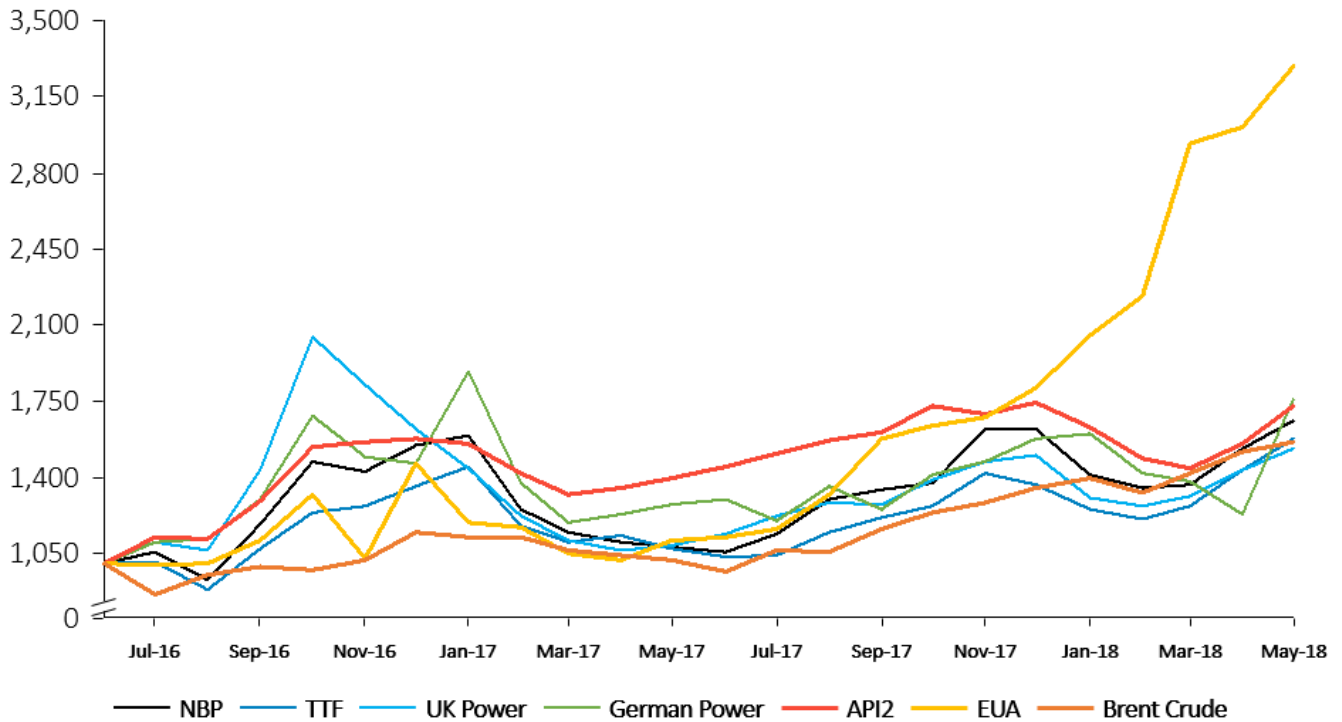
Note: Data sources on page 11.

*Monthly Contract Equivalents calculated as total volume divided by a standard monthly contract lot size (30 day month):

European Energy Markets Composition: Rebased Price Trends over Time

Information as at: 31 May 2018

Estimates based on Trayport analysis and market research



All prices are Front Month, except EUAs, which are Front Vintage.
Prices rebased 24 Months previous

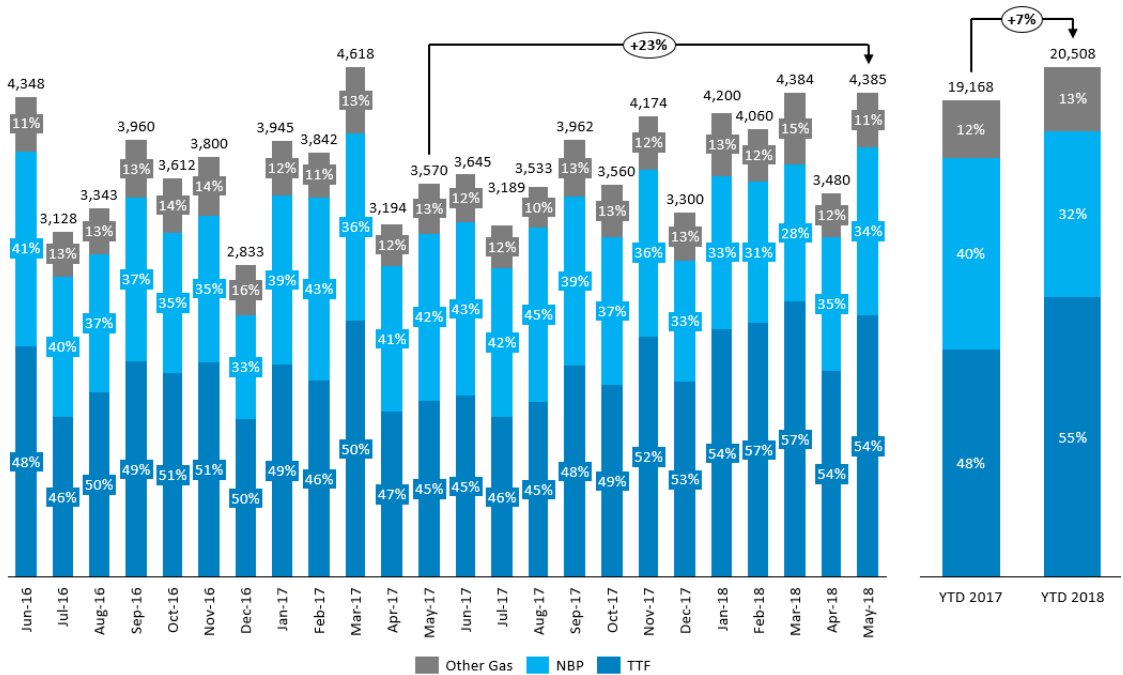
Note: Data sources on page 11.

Gas Hub Evolution

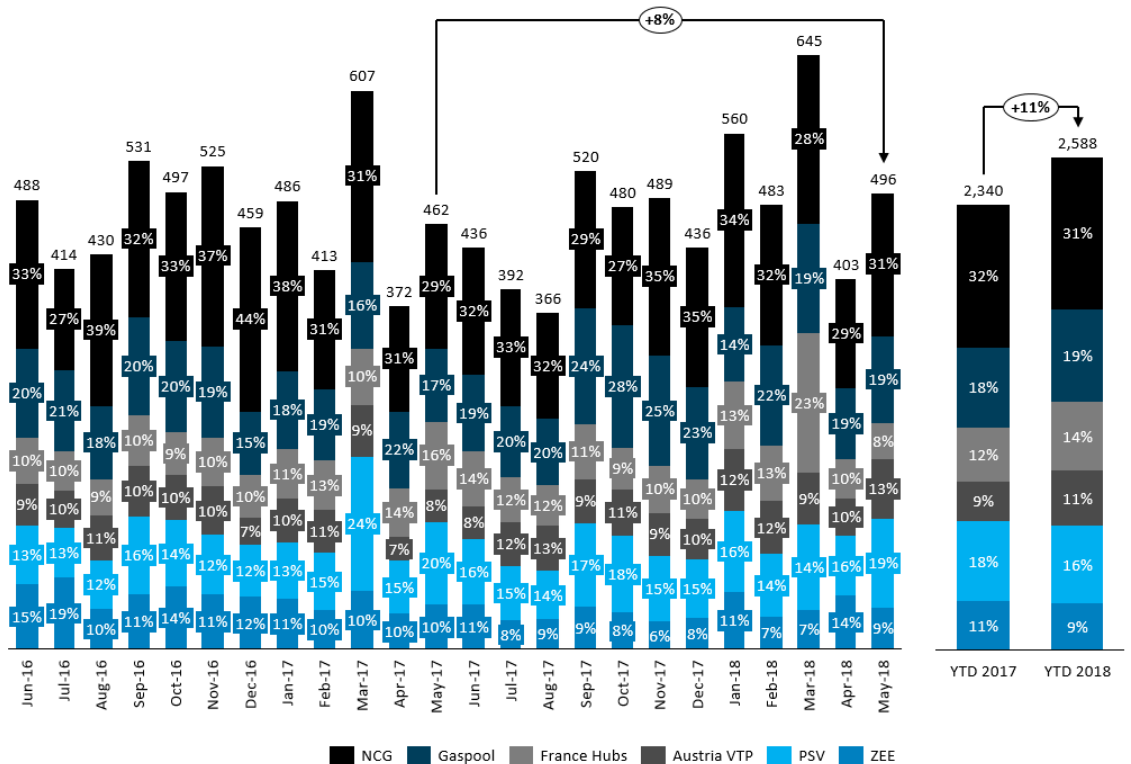
Information as at: 31 May 2018

Estimates based on Trayport analysis and market research

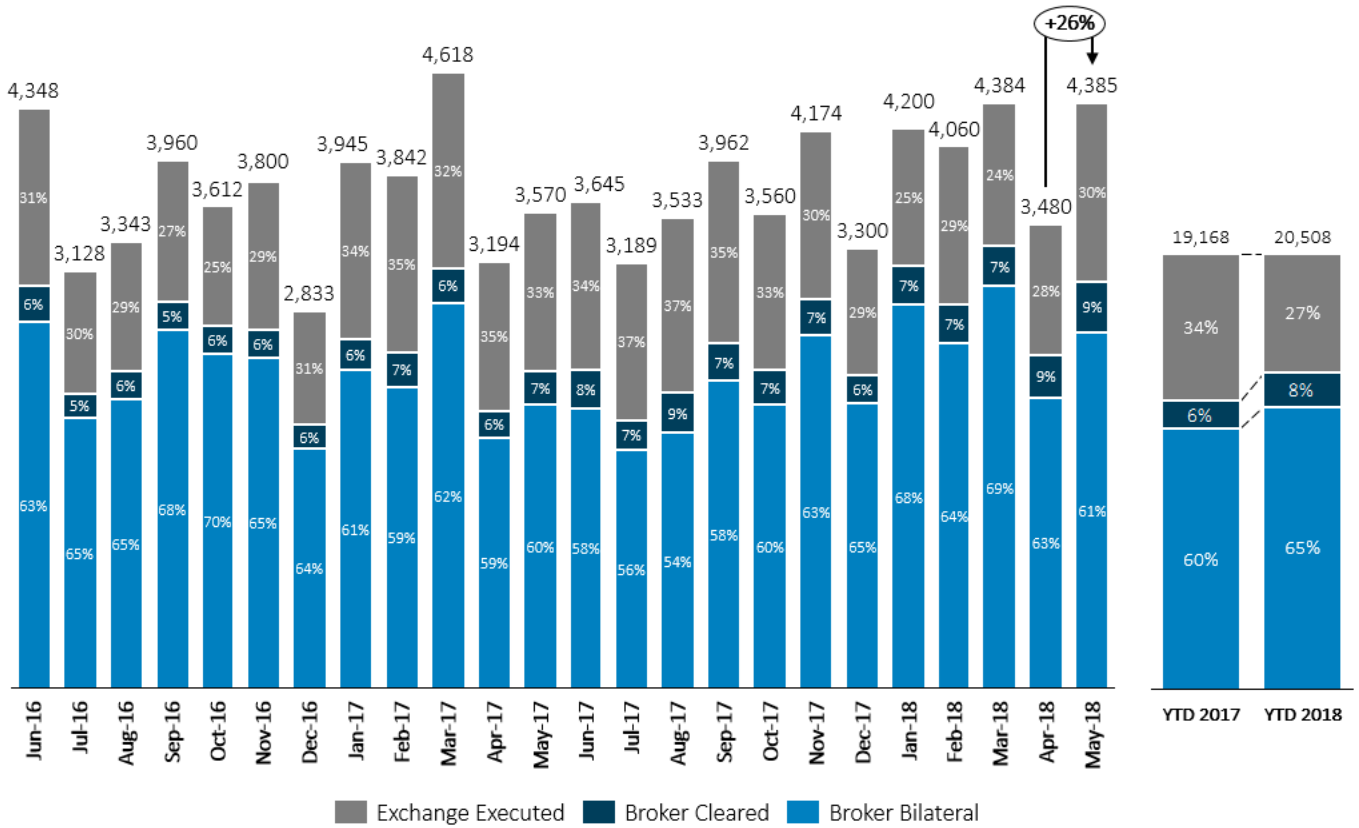
NBP, TTF & Other Gas Chart



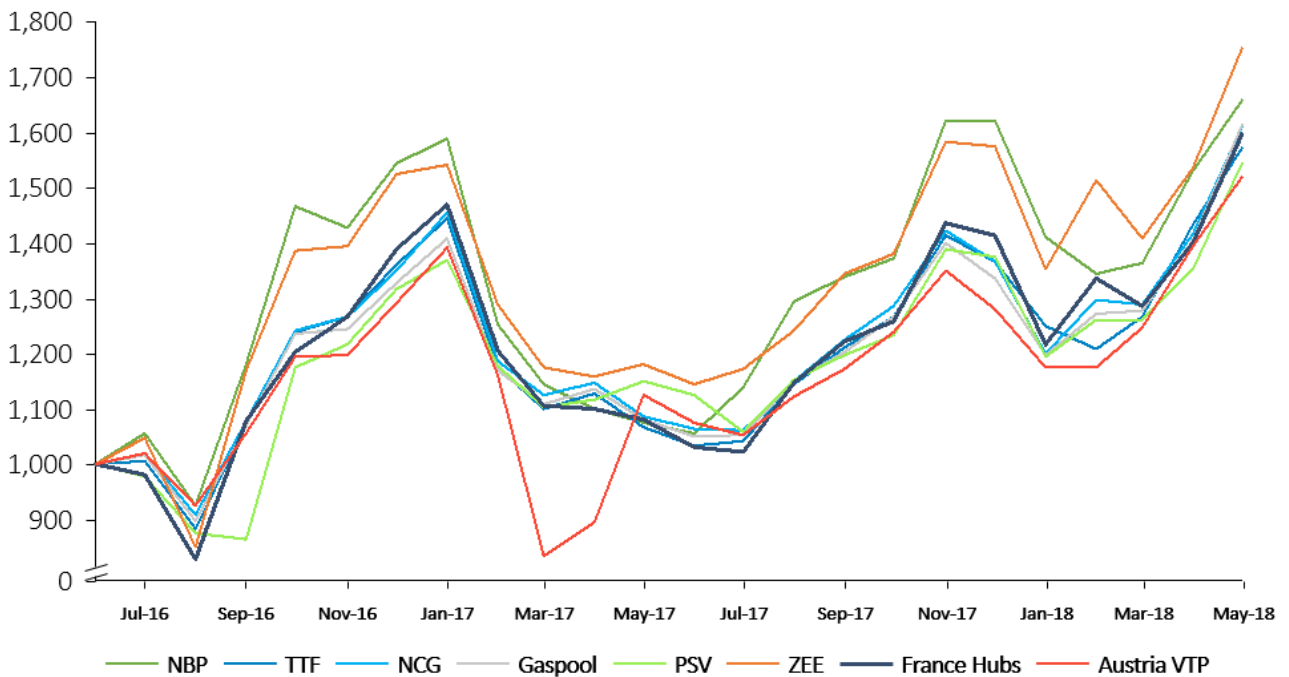
Other Gas Chart



Broker Bilateral / Broker Cleared / Exchange Executed chart



Price Indexation Chart

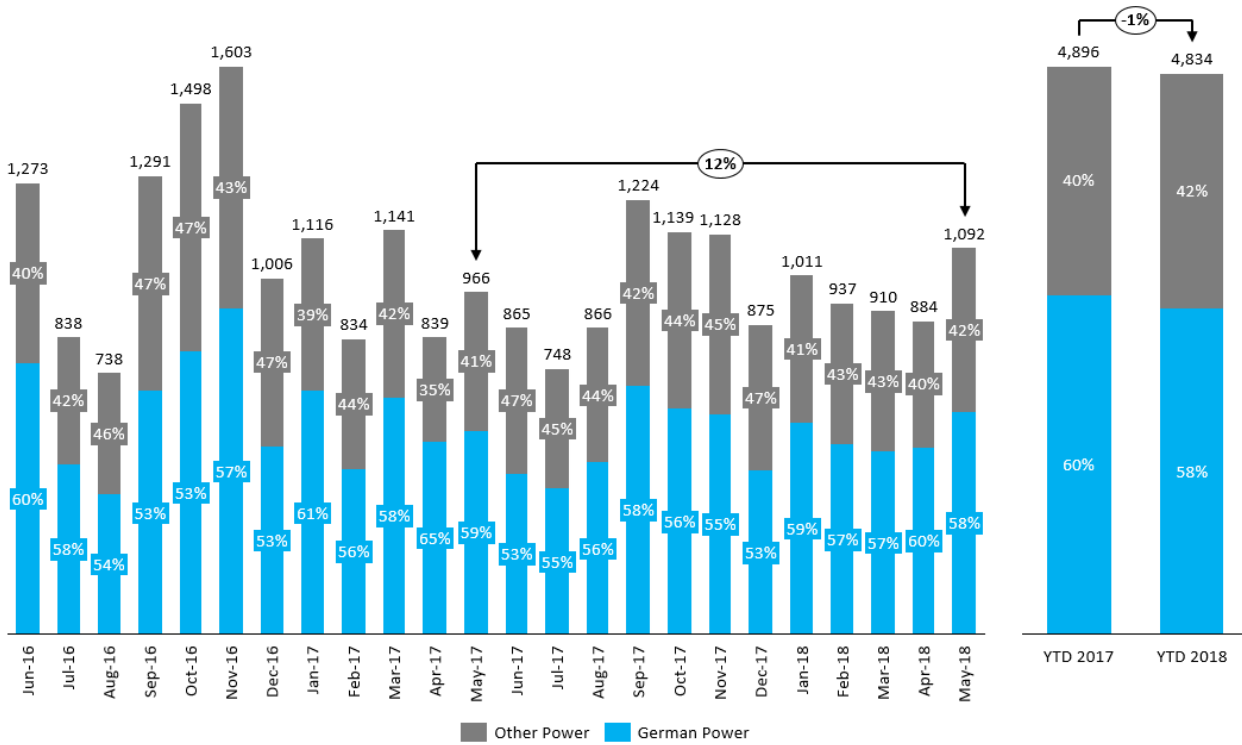


Power Market Evolution

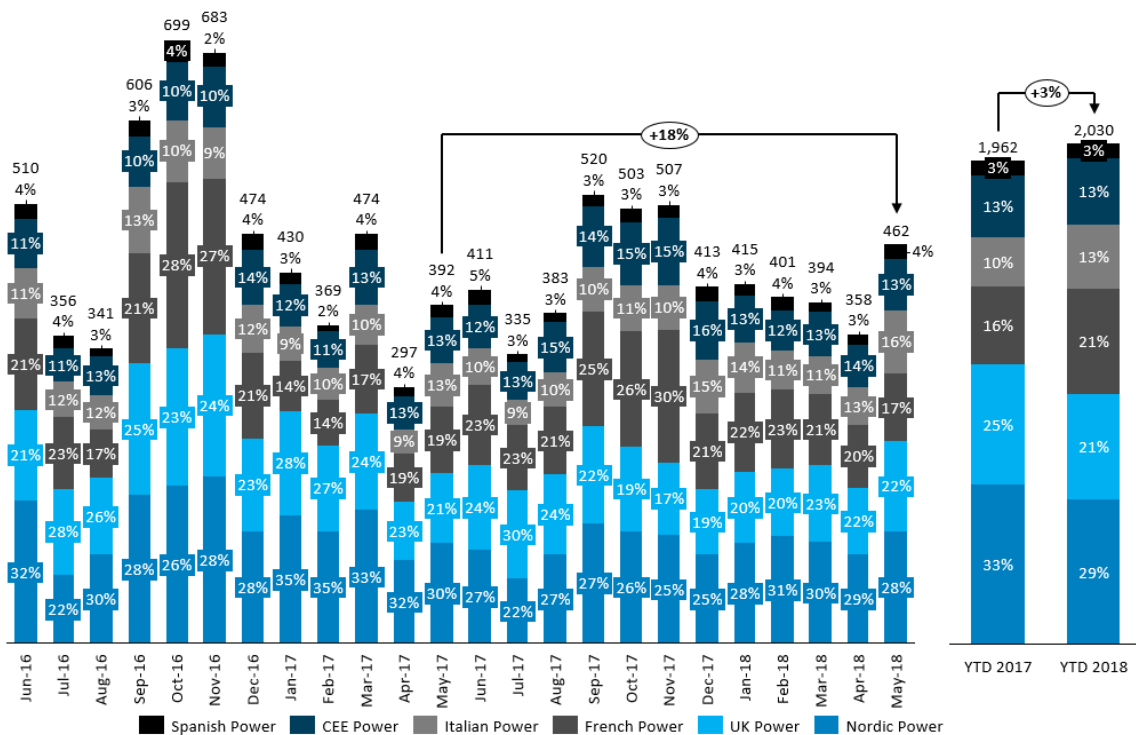
Information as at: 31 May 2018

Estimates based on Trayport analysis and market research

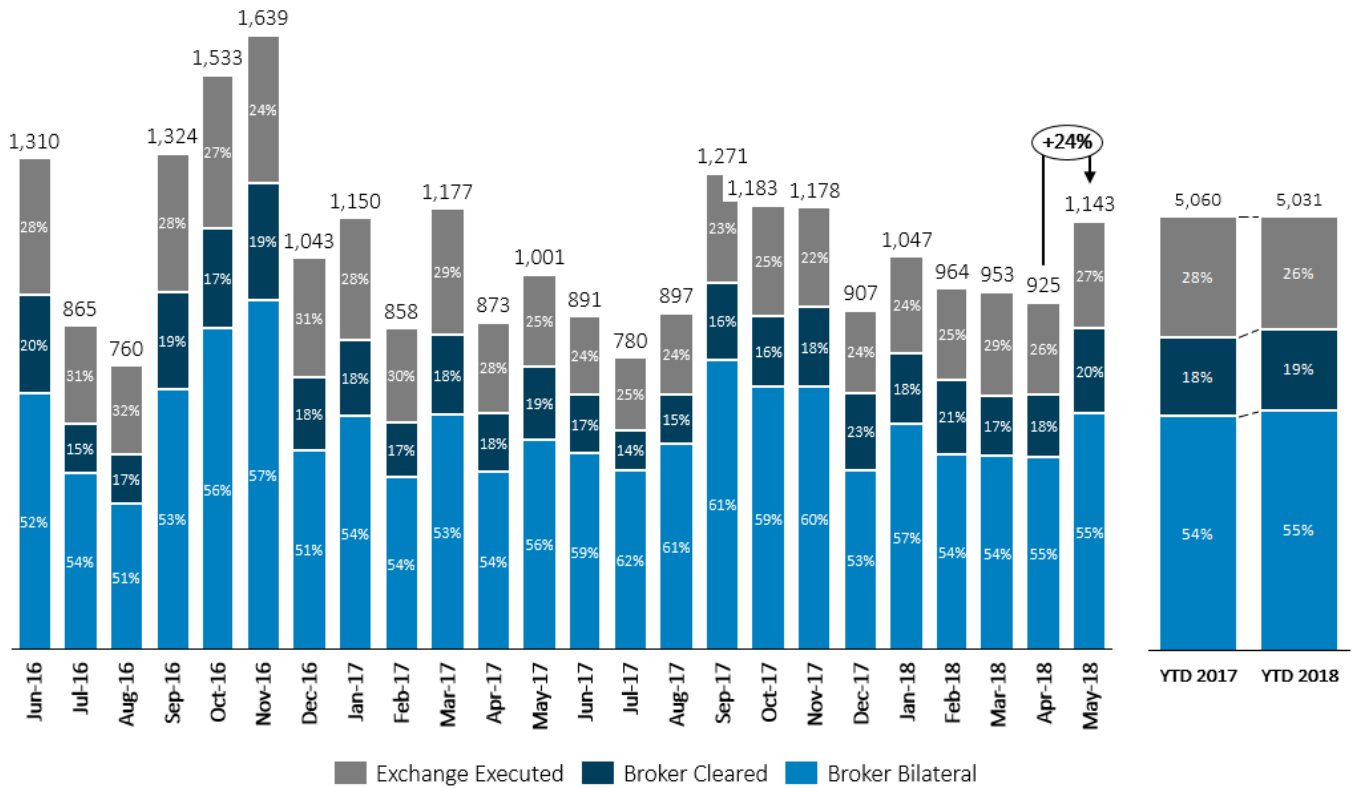
German Power & Other Power Chart



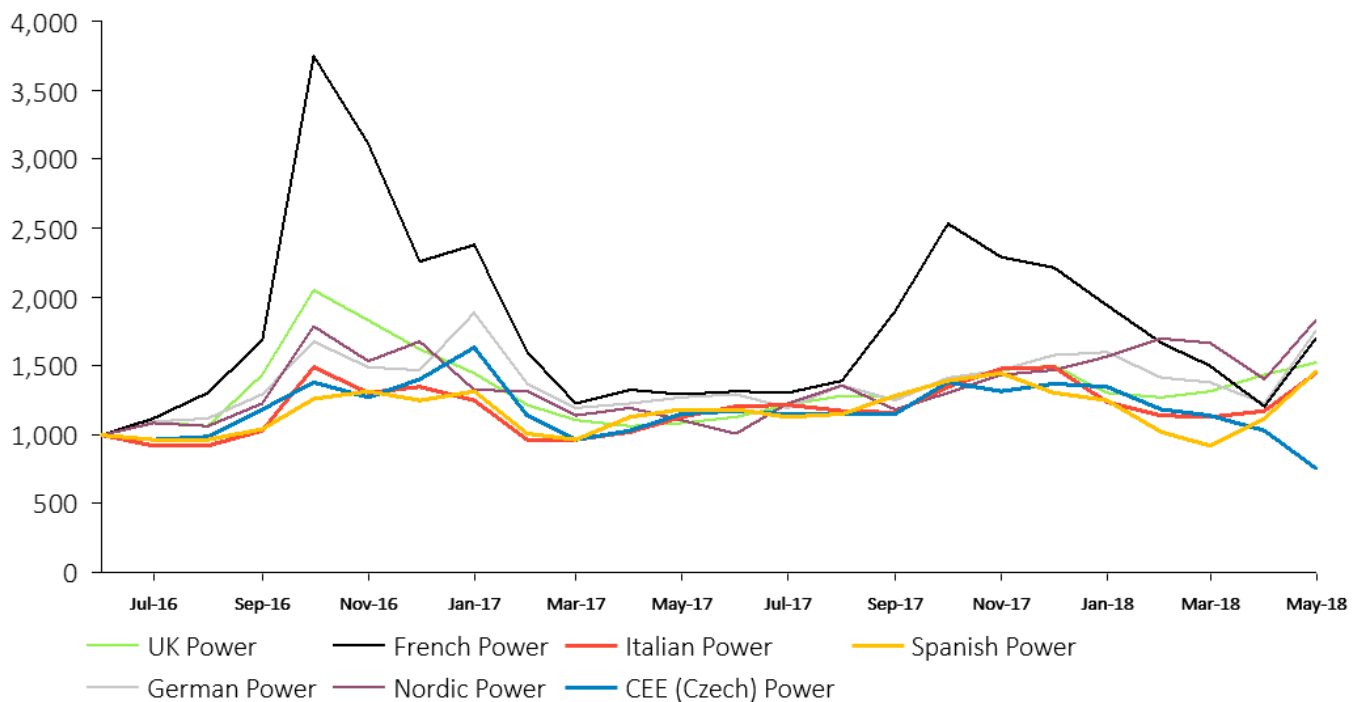
Other Power Chart



Broker Bilateral / Broker Cleared / Exchange Executed chart



Price Indexation Chart



Data Sources

OTC brokers data

LEBA www.leba.org.uk

Exchange data

APX-ENDEX Data source Jan 2011 – Oct 2013, TTF futures data only; source no longer available

Borsa Italiana S.p.A. <http://www.borsaitaliana.it/>

CME <http://www.cmegroup.com>

EEX <http://www.eex.com/>

ICE www.theice.com

NASDAQ OMX www.nasdaqomxcommodities.com

BMEClearing <http://www.meff.es>

OMIP <http://www.omip.pt>

CEGH <http://www.cegh.at>

Nord Pool Spot <http://www.nordpoolspot.com>

PolPx Terms of use of PolPX data are available on <http://www.tge.pl>

GME <http://www.mercatoelettrico.org>

Bluenext Data source Jan 2011 – Nov 2012; source no longer available

Clearing house data

LCH www.lchclearnet.com