

WHOLESALE MARKETS OBSERVATORY

3rd quarter of 2018

Wholesale electricity and natural gas markets

INTRODUCTION

The wholesale markets observatory aims to provide general monitoring indicators of electricity and natural gas in France.

This observatory is updated on a quarterly basis and published on CRE's website (www.cre.fr). A French version is also available.

The first part of the report summarizes the highlights of the quarter. The indicators (main dates, key figures and Figures) are detailed in the second part.

The underlying data of the tables displaying the key market indicators are available on the CRE's website in the "Open Data" section (www.cre.fr/Pages-annexes/Open-Data).

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QUARTERLY HIGHLIGHTS

Oil prices extended gains and hit four-year high

Brent climbed to record high at the end of September with more than 70 €/bbl following the growth trend of the second quarter. Brent prices reached 64.5 €/bbl on average during the second quarter of 2018, up by +2 % compared to the last quarter. Fears of tightened supply hit the markets, mainly due to sanctions on Iran and the subsequent losses of production that are unlikely to be offset. On the other hand, the demand outlook remains uncertain owing to concerns around the US-China trade tensions.

Coal prices rose during the third quarter to reach 78.3 €/t on average, up by +10 % compared to the previous quarter. The growing Asian demand is still one of the major factors driving the markets. Coal prices also followed the upward trend of the other commodities to reach a new high since 2013 with around 85 €/t at the end of September.

Electricity market prices rose in a context of low nuclear availability and rising commodity prices

Compared with the third quarter of 2017, French consumption during the same period in 2018 remained stable at around 93 TWh (Figure 14). Nuclear availability increased slightly (Figure 15), with an average availability rate of 66.6% (+1.5 % compared to the third quarter of 2017). However heat waves affected the nuclear industry, leading to the disruption in the functioning of some reactors. Availability rate was hence 8.9 points lower than in the second quarter of 2018 (75.5%). Overall, nuclear production amounted to 87.3 TWh, an increase of + 1.4% compared to the same period in 2017.

Compared with the year 2017, generally characterized by a low level of hydraulicity, hydraulic production in the third quarter of 2018 rose by + 16.7% to 12.2 TWh (Figure 18). However, it is down 44.9% from the previous quarter (22.2 TWh). The quarter was also marked by a -20% decrease in wind generation (4.1 TWh) compared to the previous quarter. This lower demand for hydroelectric production and the sharp fall in wind production explain the +135.5% increase in production from fossil fuels, going from 3.1 TWh to 7.3 TWh. The generation rate for the coal and gas sectors (Figures 16 and 17) was thus 20% on average during the third quarter of 2018, compared to 12% and 11%, respectively, in the previous quarter, when hydraulic production was very substantial. Compared to the third quarter of 2017 this same fossil production shows a decrease of 11.9%.

France's export balance stands at 16.5 TWh against 13.0 TWh in the third quarter of 2017 (Figure 20), an increase of 27.0%. Exports increased by + 6.0%, with a +3.6% increase in exports during peak hours and +7.3% on exports outside these periods. Imports fell by -30.3%, with a -19.3% drop in imports during peak hours and -37.2% in imports outside these periods.

Spot prices for electricity reached an average of € 57.2 / MWh in the third quarter of 2018, an increase of +66% compared to the same period in 2017. This upward trend is also marked in Germany, where German spot prices averaged € 53.5 / MWh, up + 63.5% from the previous year (Figure 10).

Calendar product prices for delivery the following year show a clear progression rising by 18% on average compared to the previous quarter, and its German equivalent increased by 20.5%. Prices reached € 53.3 / MWh and € 48.6 / MWh respectively. Compared to the same period in 2017 these prices show increases of + 36% on average for the French calendar. Prices for Monthly products increased by an average of +48% compared to the second quarter of 2018, and amounted to € 58.1 / MWh, which corresponds to an increase of about +54% compared to the third quarter 2017 (Table 2).

Regarding trading in the futures market, yearly products (Y+1) volumes traded decreased by -50% compared to the third quarter of 2017 and decreased by 14% compared to the second quarter of 2018. For monthly products (M + 1), the volumes traded are up + 60% compared to the third quarter of 2017 and + 39% compared to the second quarter of 2018. Finally, in the Spot market the volumes traded are stable compared to the same period in 2017 but show a -12% decrease compared to the previous quarter (Table 3).

Surge of natural gas prices linked to the rise of other commodities

During the third quarter of 2018, gas consumption slightly decreased by 3.4 % compared to the same quarter last year. The fall in end-user demand was not offset by the higher consumption of gas plants that were needed to complement nuclear availability level during the summer. Like in the second quarter, storage injections remained important and reached 68 TWh, up by around 50 % as compared to the third quarter of 2017. LNG imports fell by 21 % (-6 TWh) and were balanced with increasing pipeline imports that were up by 7% (+7 TWh) compared to the same period in 2017.

Day-ahead prices reached 24.4 €/MWh on average on the PEG Nord, up by 16 % compared to the previous quarter but up by 52 % compared to last year. Low LNG imports and the needs for injections are the factors that drove in particular the spot prices up. Other European gas markets experienced similar volatility trends, the TTF-PEG Nord spread settled on average at 0.2 €/MWh.

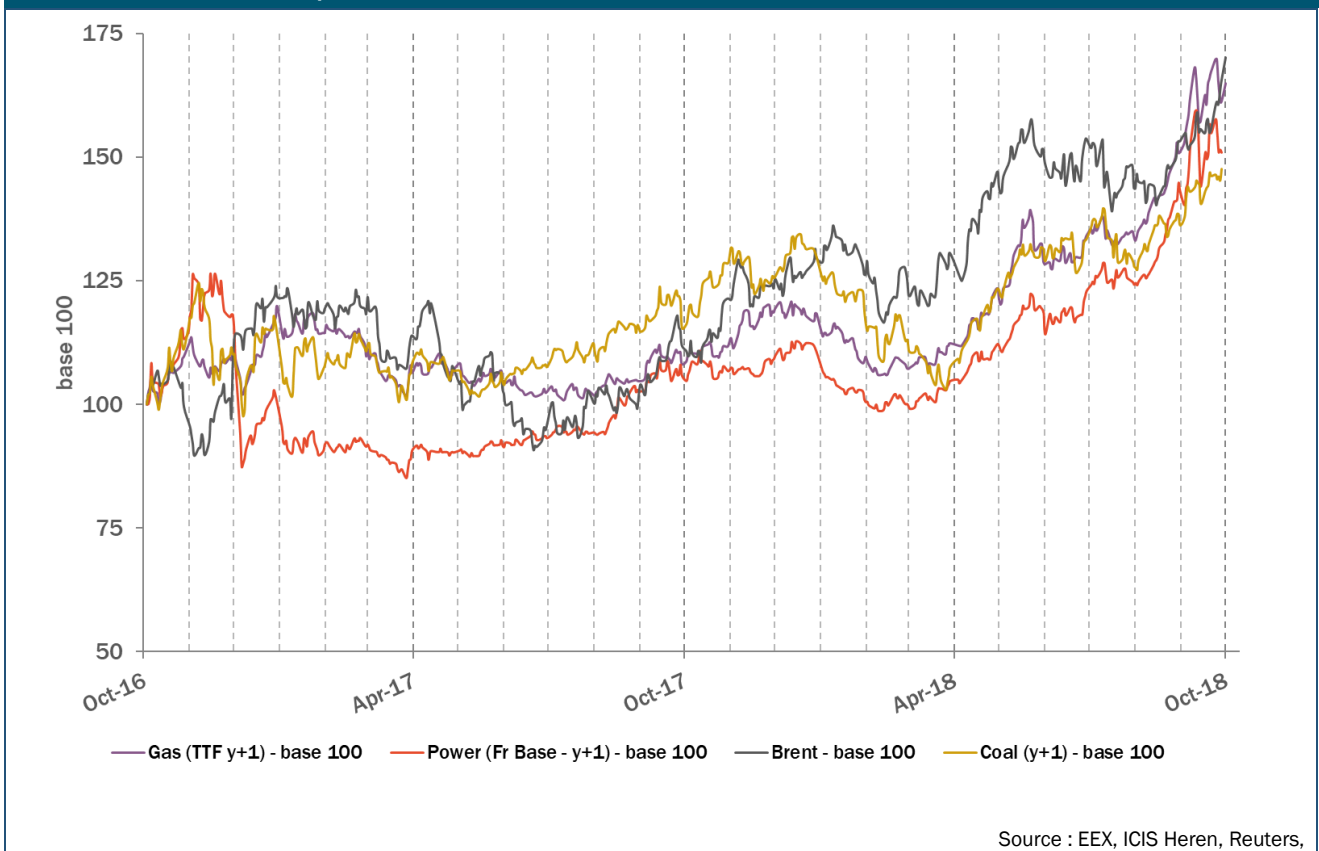
On the TRS zone, *day-ahead* prices reached 27.0 €/MWh on average, i.e. a relatively large spread of 2.6 €/MWh with the PEG Nord but that shrunk by the end of the quarter. This differential is mainly due to limited supply in the TRS zone and the low availability of the North-South link (73 %) which was therefore fully used.

Like the upward trend of the *day-ahead* prices, calendar prices rose through the quarter to settle on average at 22.9 €/MWh, up by 16 % compared to the last quarter. Similar to other commodities prices, the price for the Calendar 2019 climbed at the end of September to a 4-year high at 26.6 €/MWh.

The increase of the carbon price goes on for one year now

The increase of carbon price, which has started the third quarter of 2017, was still ongoing one year later. Whereas the third quarter closing price was 7.1 €/tCO₂ in 2017, it was 21.2 €/tCO₂ at the end of the third quarter of 2018, meaning it has almost tripled in a year. The maximum price reached over this period, which is also a ten-year high, was 25.2 €/tCO₂ at the beginning of September. Nevertheless, it was followed by a downward correction the following days. This global increase was driven by the upward trends of the others commodities as well as by the anticipation of the beginning of the Market Stability Reserve mechanism, in 2019. For the third quarter of 2017, 2375 MtCO₂ were traded on stock exchanges and via brokers, whereas in the third quarter of 2018, this volume was of 2421 MtCO₂, meaning the traded volume remained stable, after the sharp rise the previous year. Nonetheless, the carbon allowances were overbought, explaining, among others factors, the price increase and its downturn at the beginning of September.

Evolution of commodities prices



MARKET INDICATORS

PART 1: **WHOLESALE ELECTRICITY MARKET**

1. KEY DATES

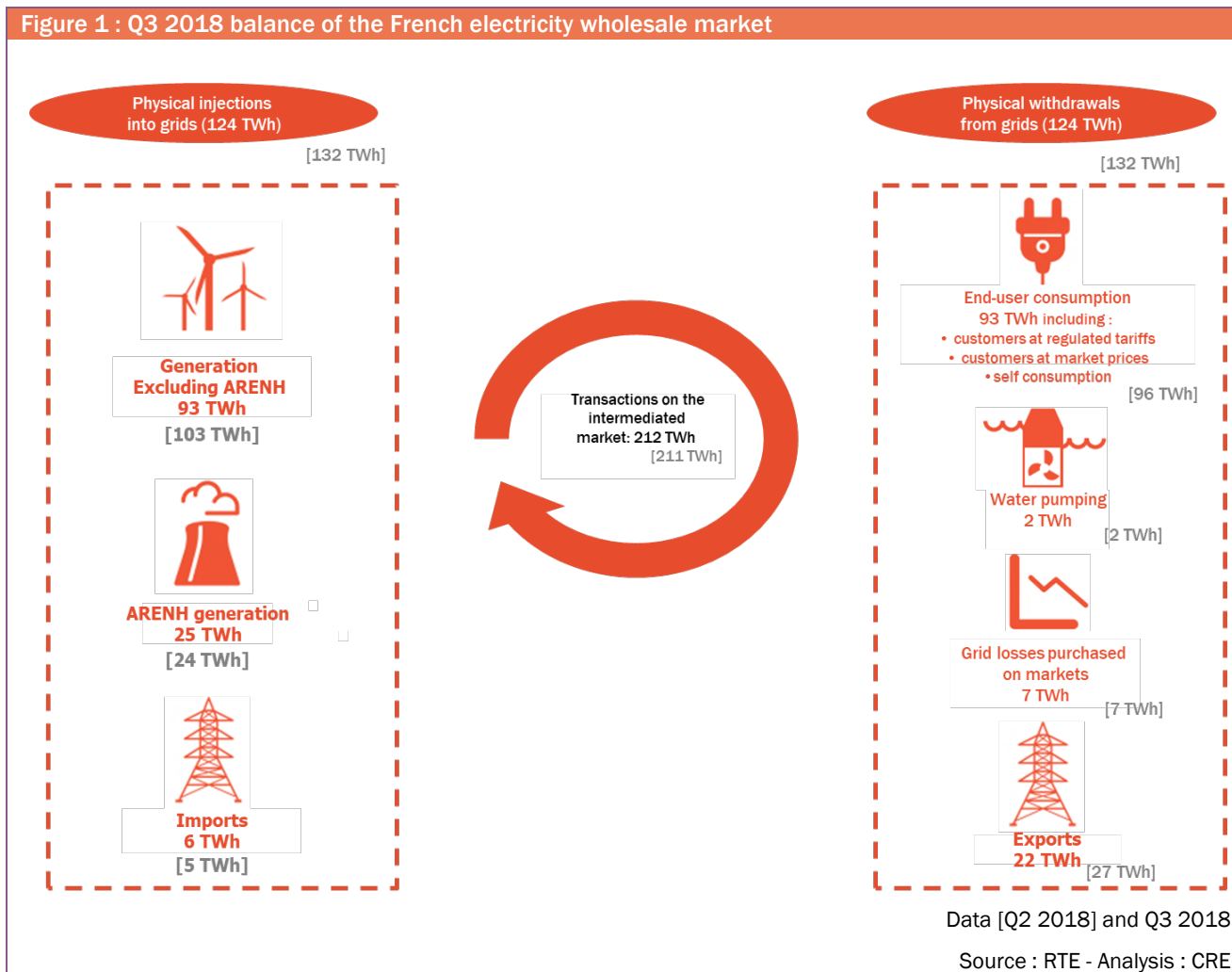
November 2000	CRE validated the initial version of the Balancing Responsible Entity (BR) contract
Early 2001	First purchases of losses on the market by RTE
May 2001	First OTC quotations published regarding the French electricity market
September 2001	First virtual power plant auctions set up by EDF (VPP)
November 2001	Launch of the Powernext Day-ahead market
June 2004	Launch of the Powernext Futures market
July 2004	First purchases of losses on the market by the distribution system operator (ERDF)
January 2006	Implementation of explicit capacity auctions on interconnections (except for Switzerland)
November 2006	Launch of the market coupling between France, Belgium and the Netherlands
July 2007	Launch of Powernext Intraday and Continuous markets
March 2009	A sixth broker active on the French electricity wholesale market
April 2009	Merger of Powernext and EEX markets - launch of EPEX SPOT and EPD for futures contracts
November 2010	Day-ahead market coupling with France, Belgium, Netherlands, Luxembourg and Germany
December 2010	Start of the intraday market coupling between Germany and France
July 2011	First ARENH subscription
November 2011	Futures products traded on EPD France become cash-settled
November 2011	End of VPP auctions ¹
January 2012	Beginning of explicit auctions for long-term cross-border transmission capacity allocations between France and Switzerland.
January 2012	Beginning of explicit intraday cross-border transmission capacity allocations between France and Switzerland
June 2012	Beginning of explicit intraday cross-border transmission capacity allocations between France and Italy
June 2013	Launch of the Swiss intraday market, and intraday market coupling with Germany and France
February 2014	Coupling of the NWE zone
April 2014	Coupling of the SWE zone
May 2014	Coupling of NWE and SWE zones
September 2014	New EEX transparency platform (www.eex-transparency.com)

¹ http://encherescapacites.edf.com/fichiers/fckeditor/File/Encheres/DecisionCE_Fin_VPP_301111.pdf

December 2014	New RTE transparency platform in order to comply with the transparency rules CE 543/2013
February 2015	Extension of market coupling to France-Spain border and Austria-Slovenia border
May 2015	Flow-based methodology for CWE market coupling successfully launched
December 2015	Transition to half-hourly products in the intraday market for the France-Switzerland and France-Germany interconnections
March 2016	Transition to explicit continuous capacity allocations for France-Belgium in the intraday market
October 2016	Intraday market coupling of Belgium and the Netherlands. The France-Belgium interconnection capacity is only implicitly available.
December 2016	Launch of the first auction of capacity guarantee
March 2017	Launch of 30 minutes products on Intraday market in France, Germany and Switzerland
June 2018	XBID launch : European cross-border intraday trading platform

2. BALANCE OF THE WHOLESALE ELECTRICITY MARKET

Figure 1 : Q3 2018 balance of the French electricity wholesale market



3. KEY DATA

Table 1 : Physical flows on the wholesale electricity market

	Quarterly values					Quarterly variation Q3 2018 / Q2 2018		Yearly variation Q3 2018 / Q3 2017	
	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	In percentage	In values	In percentage	In values
Injections, in TWh									
Production (excluding ARENH and VPP), in TWh	94	117	140	103	92	-10%	-10,04	-2%	-1,61
ARENH, in TWh	21	21	23	24	25	-	1,21	20%	4,08
Imports, in TWh	7	15	10	5	6	23%	1,16	-16%	-1,22
Withdrawals, in TWh									
Consumption, in TWh	93	123	137	96	93	-3%	-2,91	0%	-0,06
Water pumping, in TWh	1	2	2	2	2	-14%	-0,26	7%	0,11
Exports, in TWh	21	17	24	27	22	-18%	-4,88	6%	1,23
Grid losses, in TWh	7	10	11	7	7	-4%	-0,26	0%	-0,03

Source : RTE – Analysis : CRE

Table 2 : Wholesale electricity market prices during the quarter

	Quarterly values					Quarterly variation Q3 2018 / Q2 2018		Yearly variation Q3 2018 / Q3 2017	
	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	In percentage	In values	In percentage	In values
Spot Market prices									
Intraday Price France, in €/MWh	34,6	57,7	46,2	37,1	57,1	54%	20,01	65%	22,47
Day-Ahead Base Price France, in €/MWh	34,5	56,6	43,8	36,8	57,2	56%	20,46	66%	22,70
Day-Ahead Peak Price France, in €/MWh	40,3	70,0	52,1	44,2	64,3	45%	20,09	60%	24,01
Spread Base Day-Ahead France-Germany, in €/MWh	1,8	23,1	8,3	0,8	3,7	379%	2,93	106%	1,91
Spread Peak Day-Ahead France-Germany, in €/MWh	2,6	23,5	8,1	3,6	4,5	23%	0,82	70%	1,85
France-Germany Day-Ahead prices convergence rate	62%	7%	31%	28%	54%	93%	0,26	-13%	-0,08
Futures Market Prices									
M+1 Price France, in €/MWh	37,8	63,2	44,0	39,3	58,1	48%	18,79	54%	20,29
Spread M+1 France-Germany, in €/MWh	3,3	22,5	6,9	0,9	3,8	337%	2,90	13%	0,43
Q+1 Price France, in €/MWh	47,5	55,4	34,0	41,4	68,3	65%	26,92	44%	20,87
Spread Q+1 France-Germany, in €/MWh	10,5	13,9	1,3	0,6	13,1	2064%	12,49	25%	2,65
Y+1 Price France, in €/MWh	39,1	42,5	40,0	45,0	53,3	18%	8,31	36%	14,23
Spread Y+1 France-Germany, in €/MWh	6,1	5,9	5,0	4,7	4,9	5%	0,25	-19%	-1,13
Ratios Y+1 Peakload/Baseload ratios									
France	129%	129%	128%	127%	127%	0%	0,00	-2%	-0,03
Germany	124%	124%	125%	124%	122%	-1%	-0,01	-2%	-0,02

Source : EPEX SPOT, EEX Power Derivatives, Courtiers – Analysis : CRE

Table 3 : Traded volumes during the quarter

	Quarterly values					Quarterly variation Q3 2018 / Q2 2018		Yearly variation Q3 2018 / Q3 2017	
	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	In percentage	In values	In percentage	In values
NEB									
NEB volumes, in TWh	98,96	114,00	119,92	102,17	99,65	-2%	-2,52	1%	0,69
Ratio NEB/Consumption in France	106%	93%	88%	107%	107%	-	0,01	-	0,01
Spot Market, in TWh									
Volumes on EPEX SPOT Intraday market, in TWh	1,6	1,8	2,0	1,9	2,4	24%	0,48	48%	0,78
Fr-De Cross-Border Intraday volumes market shares	80%	57%	65%	72%	76%	7%	0,05	-5%	-0,04
Volumes on EPEX SPOT Day-Ahead market, in TWh	28,0	24,7	29,8	31,4	28,1	-11%	-3,39	0%	0,10
Volumes on Brokers Day-Ahead market, in TWh	5,0	6,4	7,8	5,8	4,0	-31%	-1,82	-20%	-0,98
Futures Market									
Volumes, in TWh	243,5	326,8	238,7	171,7	177,5	3%	5,8	-27%	-66,06
Brokers market share	86,5%	86,1%	87,1%	83,3%	82,9%	-	-0,4%	-	-3,6%
EEX Power Derivatives market share	13,5%	13,9%	12,9%	16,7%	17,1%	-	0,4%	-	3,6%
Number of Transactions	20 351	28 061	32 098	16 873	21 738	29%	4 865	7%	1 387
Brokers market share	85,3%	79,7%	84,8%	83,8%	84,9%	-	1,1%	-	-0,5%
EEX Power Derivatives market share	14,7%	20,3%	15,2%	16,2%	15,1%	-	-1,1%	-	0,5%
Y+1 product									
Volumes, in TWh	101,2	149,2	58,9	59,6	51,0	-14%	-8,59	-50%	-50,22
Number of Transactions	2584	3465	1593	1667	1622	-3%	-45	-37%	-962
Q+1 product									
Volumes, in TWh	26,6	38,0	35,7	19,7	27,8	41%	8,11	4%	1,19
Number of Transactions	2276	3485	2972	1371	2485	81%	1114	9%	209
M+1 product									
Volumes, in TWh	24,9	29,0	42,9	21,5	34,5	60%	12,99	39%	9,63
Number of Transactions	4300	6873	9771	4391	6922	58%	2531	61%	2622

Source : RTE – Analysis : CRE

Table 4 : Availability of electricity generating plants

	Quarterly values					Quarterly variation Q3 2018 / Q2 2018		Yearly variation Q3 2018 / Q3 2017	
	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	In percentage	Variation	In percentage	Variation
Nuclear power plants									
Average nuclear generation rate (%)	60,3	65,7	80,2	66,5	61,5	-5,0		1,2	
Availability rate of nuclear power plants (%)	65,1	70,4	86,7	75,5	66,6	-8,9		1,5	
Hydraulic storage capacity rate									
Hydro storage level (end of quarter) (%)	29,6	21,3	37,9	37,1	25,6	-11,5		-4,0	

Source : RTE- Analysis : CRE

Table 5 : Cross-border flows

	Quarterly values					Quarterly variation Q3 2018 / Q2 2018		Yearly variation Q3 2018 / Q3 2017	
	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	In percentage	Variation	In percentage	Variation
Imports (TWh)									
Imports (TWh)	7,5	14,6	10,5	5,1	5,2	3,0%	0,2	-30,3%	-2,3
Peakload imports (TWh)	2,9	5,5	4,0	2,2	2,3	8,3%	0,2	-19,3%	-0,6
Offpeak imports (TWh)	4,6	9,1	6,5	2,9	2,9	-1,0%	0,0	-37,2%	-1,7
Exports (TWh)									
Exports (TWh)	20,5	16,6	23,4	25,9	21,7	-16,0%	-4,1	6,0%	1,2
Peak exports (TWh)	6,9	5,2	8,7	9,1	7,2	-21,2%	-1,9	3,6%	0,3
Offpeak exports (TWh)	13,6	11,4	14,6	16,8	14,6	-13,2%	-2,2	7,3%	1,0
Net balance (TWh)									
Net balance (TWh)	13,0	2,0	12,9	20,8	16,5	-20,6%	-4,3	27,0%	3,5

Source : RTE- Analysis : CRE

Table 6 : French balancing responsible entities

	Quarterly values					Quarterly variation Q3 2018 / Q2 2018		Yearly variation Q3 2018 / Q3 2017	
	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	In percentage	Variation	In percentage	Variation
Balancing responsible									
Active in electricity generation	18	19	20	19	20	5,3%	1	11,1%	2
Holder of rights of regulated access to ARENH	16	16	18	17	18	0,0%	1	0,0%	2
Final customers provider	28	27	28	27	27	0,0%	0	-3,6%	-1
Active on imports/exports	47	47	49	46	44	-4,3%	-2	-6,4%	-3
Active on block exchange	85	87	82	82	83	1,2%	1	-2,4%	-2

Source : RTE- Analysis : CRE

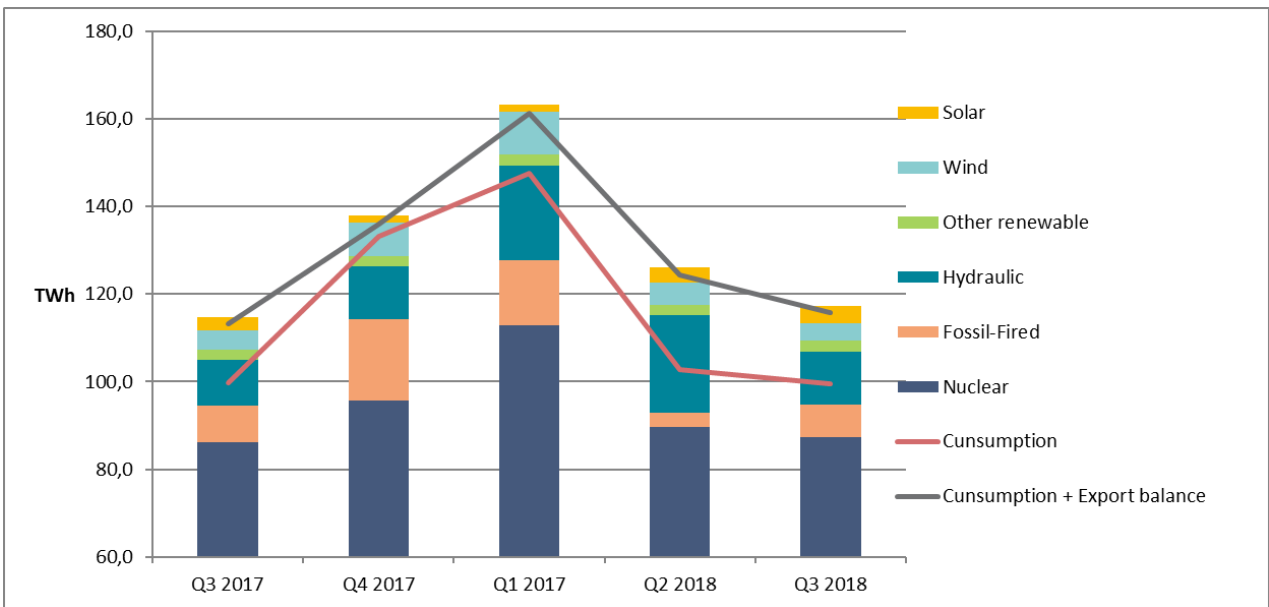
Table 7 : Index of market concentration

	HHI - Concentration indices					
	Q2 2017		Q2 2018		Q3 2018	
		EDF included		EDF included		EDF included
Wholesale energy market						
OTC - block purchases	330	809	402	1084	397	880
OTC - block sales	537	756	652	863	560	761
EPEX - purchases	712	1297	450	731	357	966
Injections						
Generation	3990	7449	4217	4201	3958	7362
Imports	2200	1635	1580	1234	860	852
Deliveries						
End-consumer consumption	1738	4639	1298	3996	1275	3882
Grid losses	1562	1671	2178	1926	2303	2000
Exports	1756	1444	1416	1999	1107	1108

Source : RTE, EPEX SPOT, EEX Power Derivatives, Courtiers - Analysis : CRE

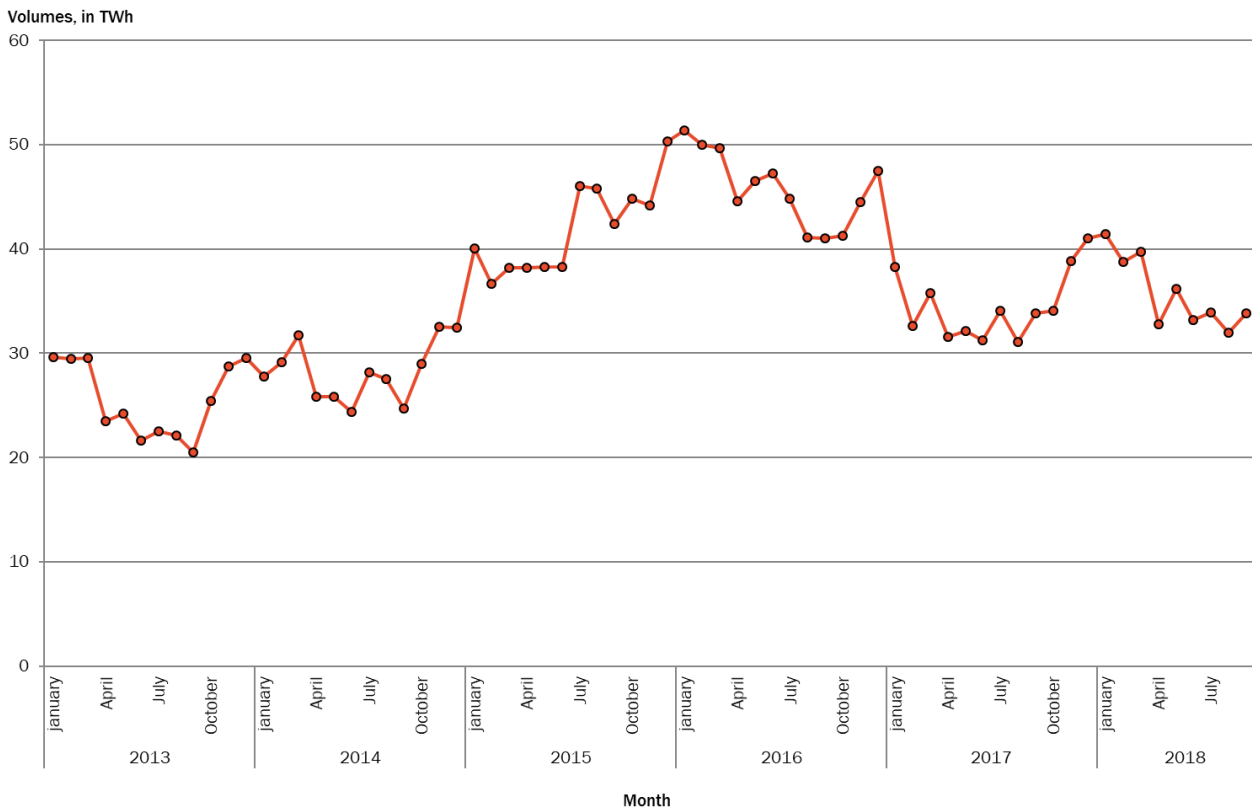
4. FIGURES

Figure 2 : Generation per technology and quarterly consumption



Source : RTE – Analysis : CRE

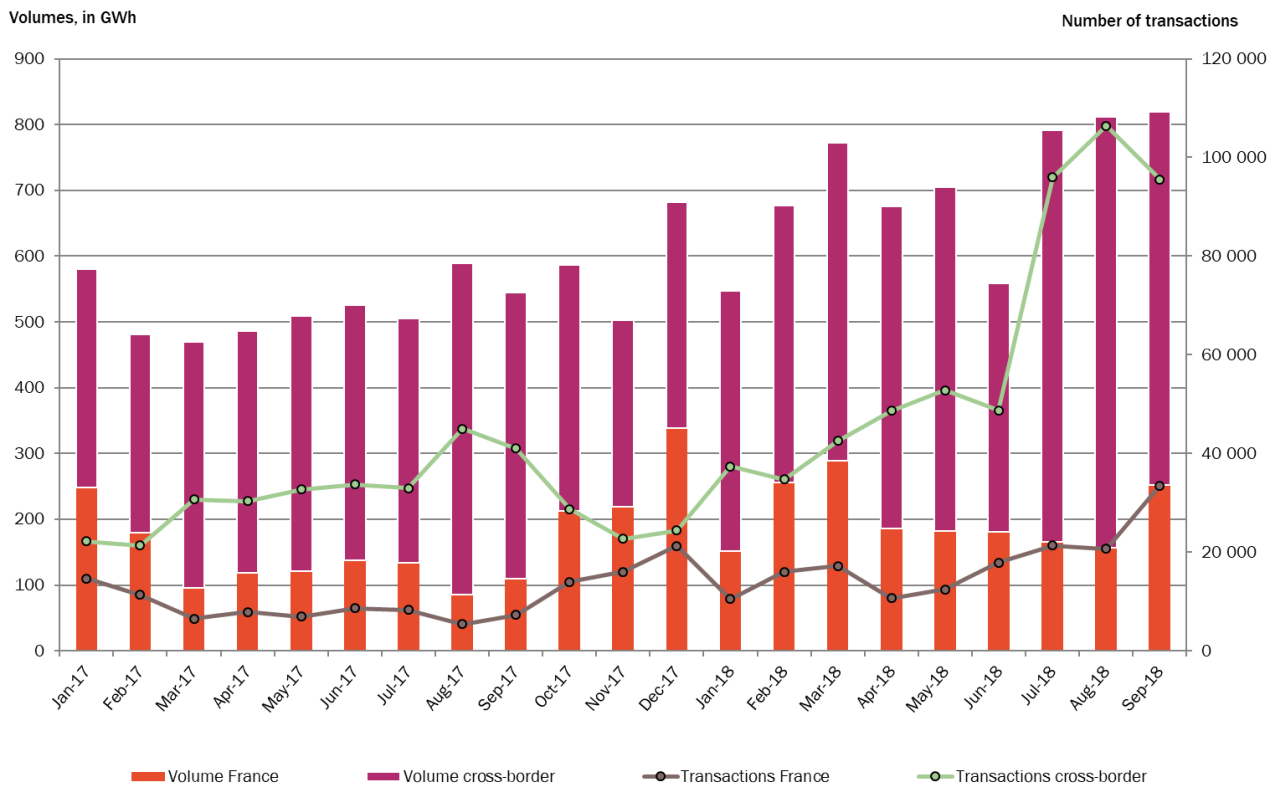
Figure 3 : Volume of net deliveries resulting from OTC transactions (excluding ARENH)



Source : RTE – Analysis : CRE

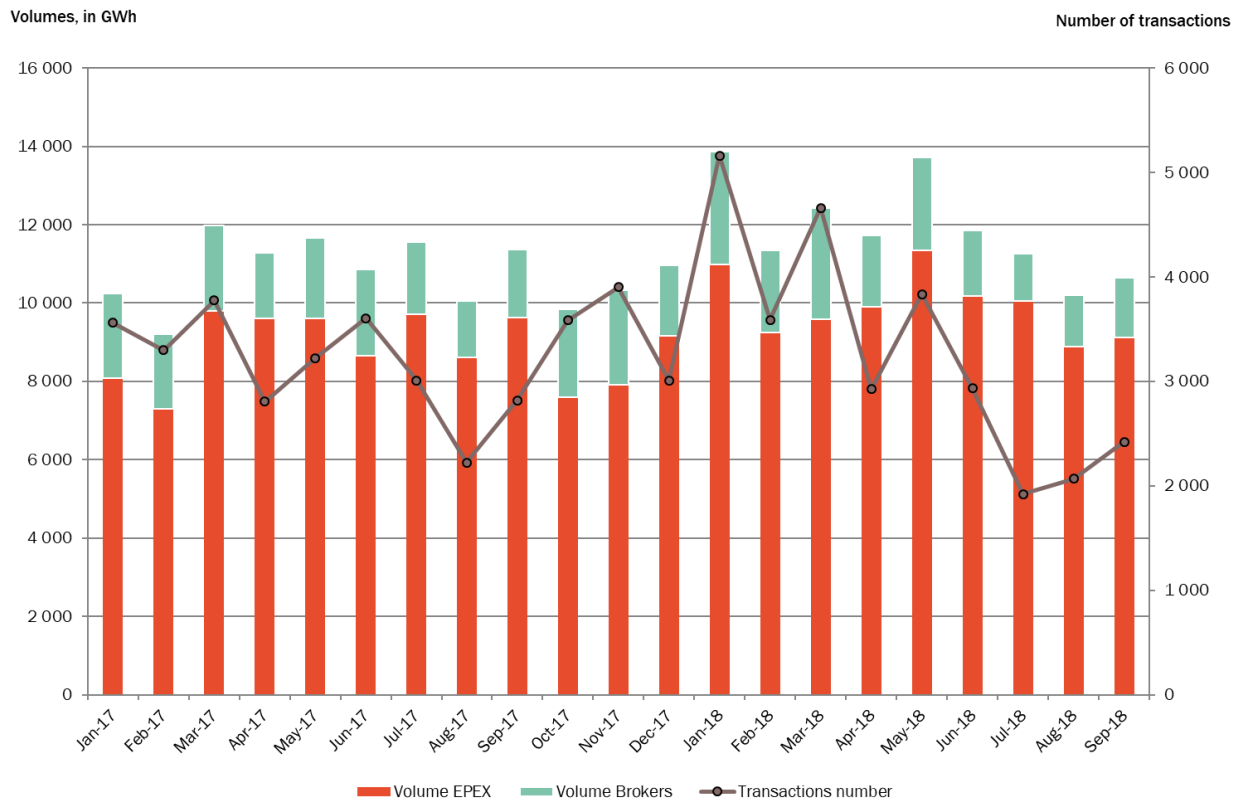
Figure 4 : Volumes and amount of intraday transactions on the EPEX SPOT exchange

// SUMS ON A MONTHLY BASIS //



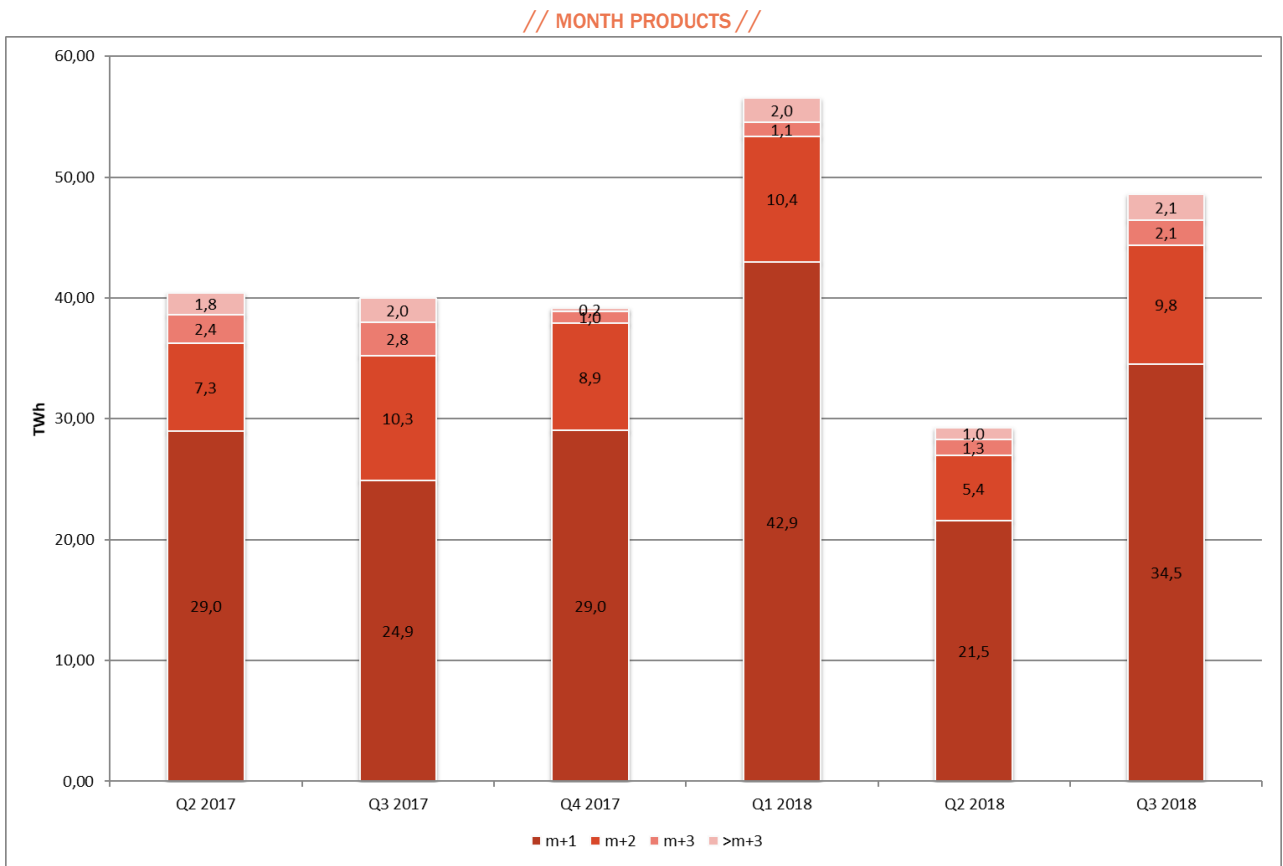
Source : EPEX SPOT, Courtiers - Analysis : CRE

Figure 5 : Volumes and amount of day-ahead transactions on the OTC intermediated market and the EPEX SPOT exchange



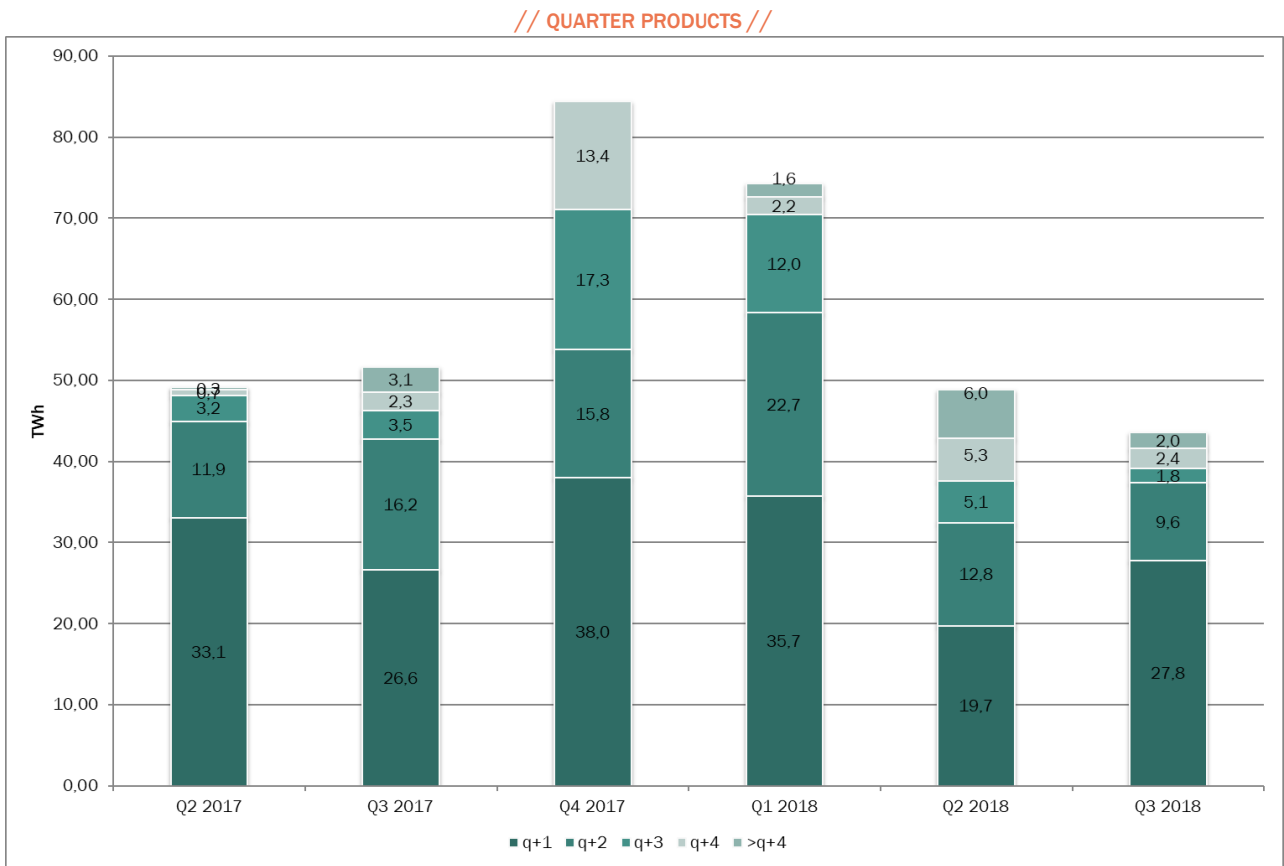
Source : EPEX SPOT, Courtiers – Analysis : CRE

Figure 6 : Quarterly traded volumes on the intermediated wholesale market



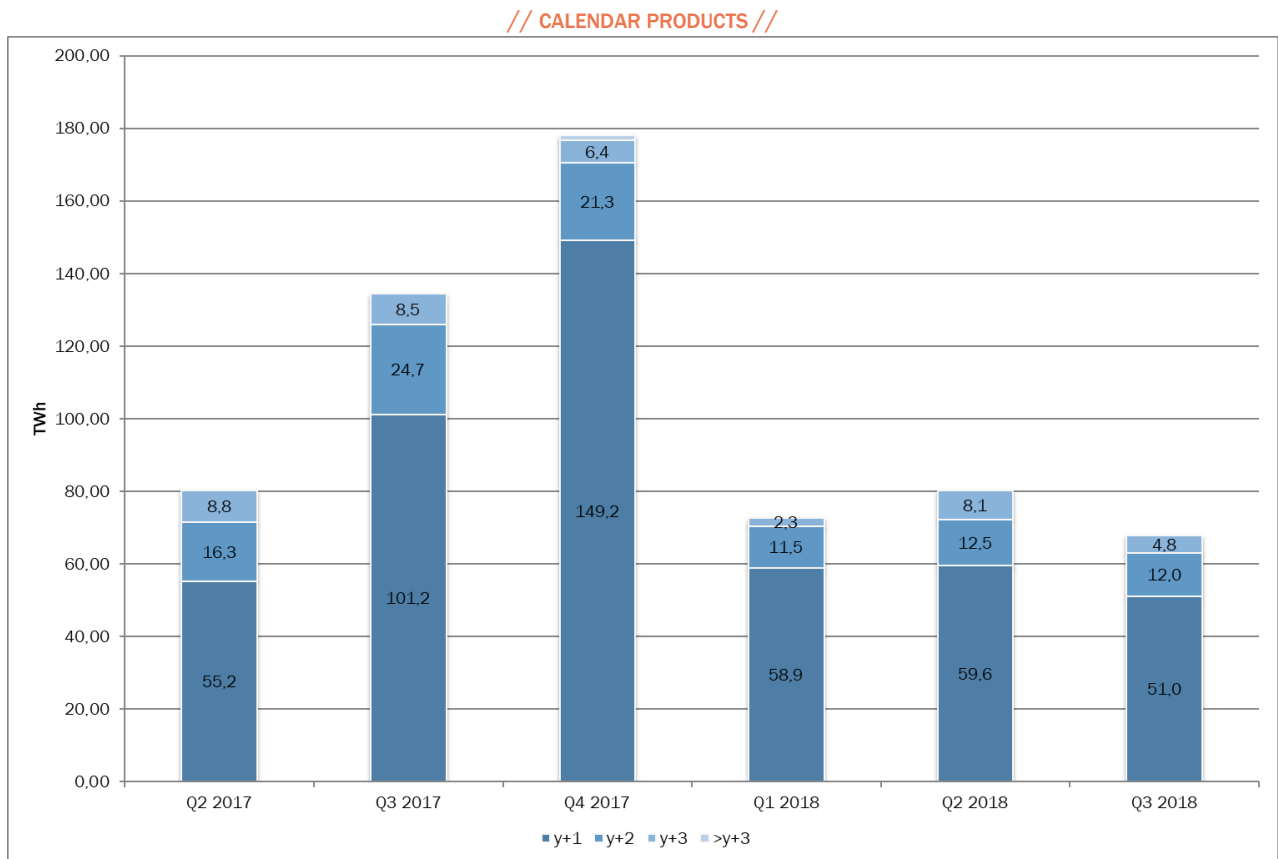
Source : Courtiers, EPD France – Analysis : CRE

Figure 7 : Quarterly traded volumes on the intermediated wholesale market



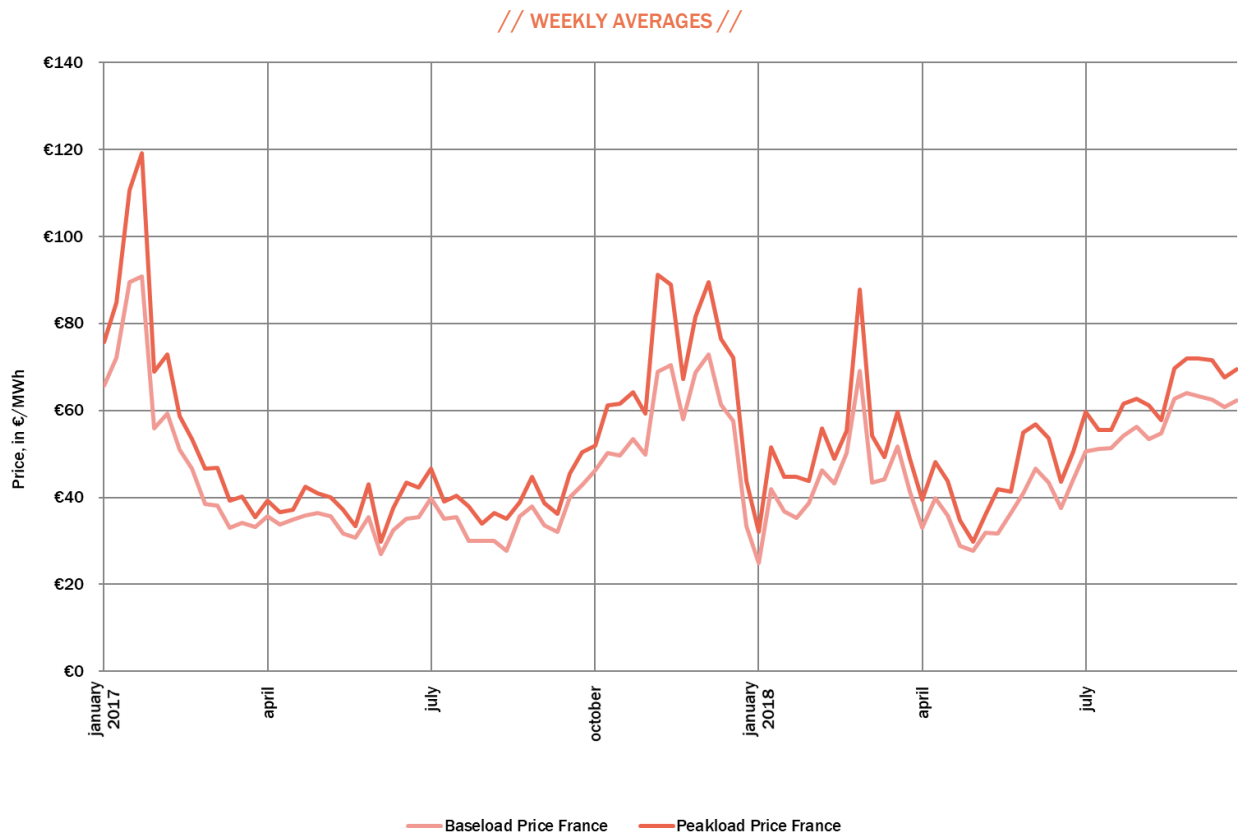
Source : Courtiers, EPD France – Analysis : CRE

Figure 8 : Quarterly traded volumes on the intermediated wholesale market



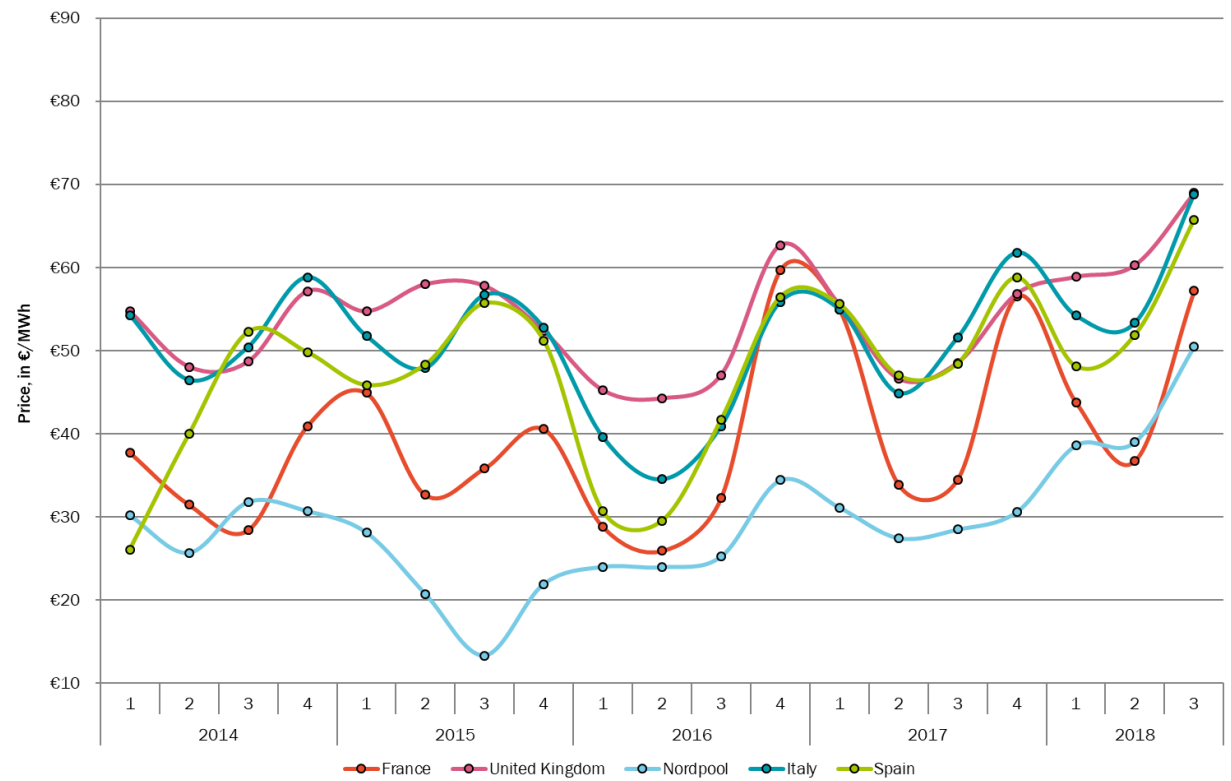
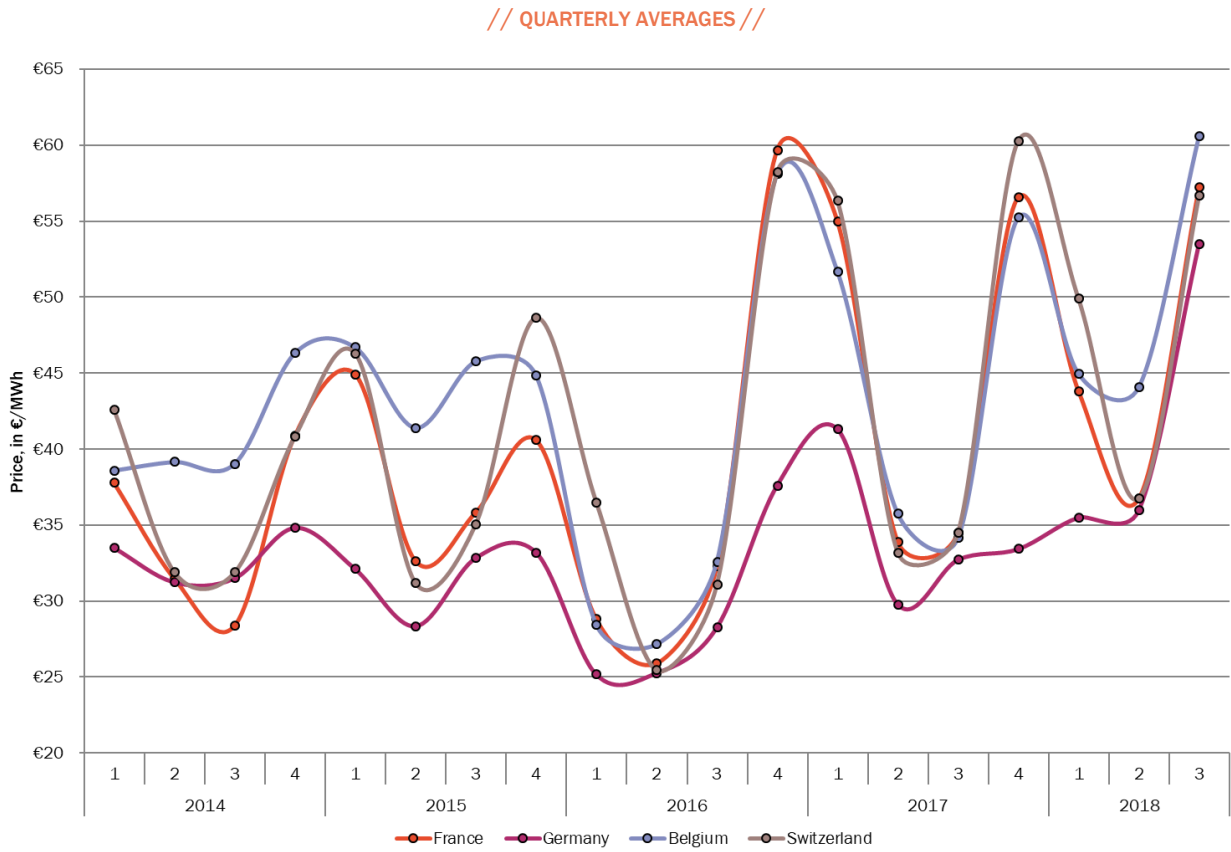
Source : Courtiers, EPD France – Analysis : CRE

Figure 9 : French Day-ahead prices on EPEX SPOT (baseload and peakload) EPEX SPOT



Source : EPEX SPOT – Analysis : CRE

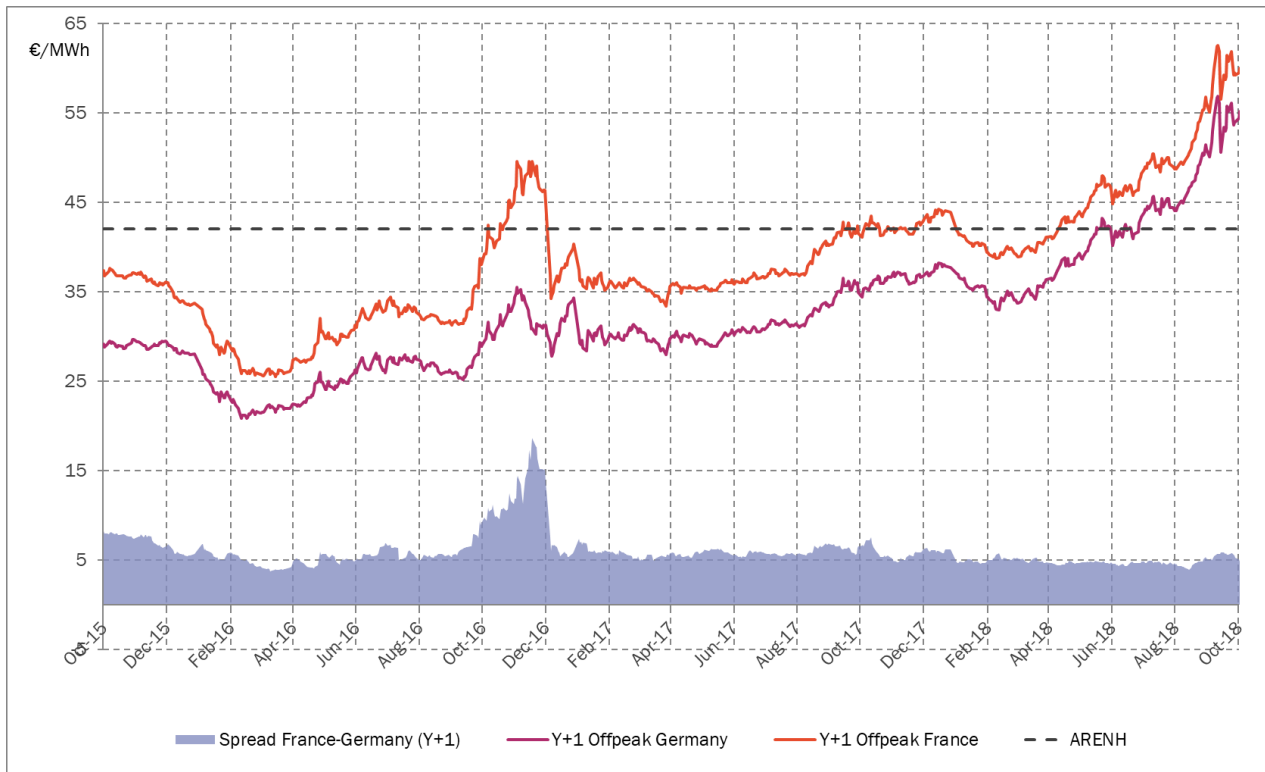
Figure 10 : Day-Ahead Baseload prices on the main European electricity markets



Source : EPEX SPOT, Nordpool, N2EX, GME, OMEL, BELPEX - Analysis : CRE

Figure 11 : Baseload Y+1 calendar prices in France and Germany

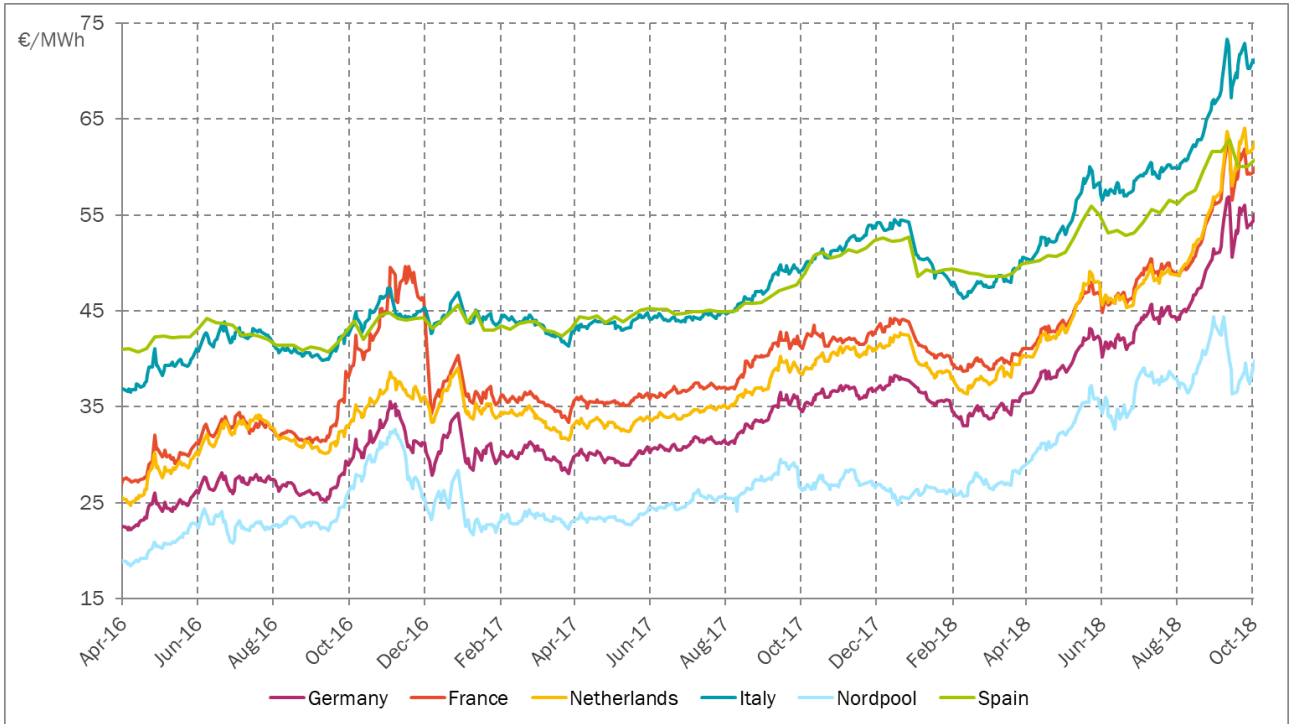
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Source : EEX Power Derivatives – Analysis : CRE

Figure 12 : Baselaod Y+1 calendar prices in Europe

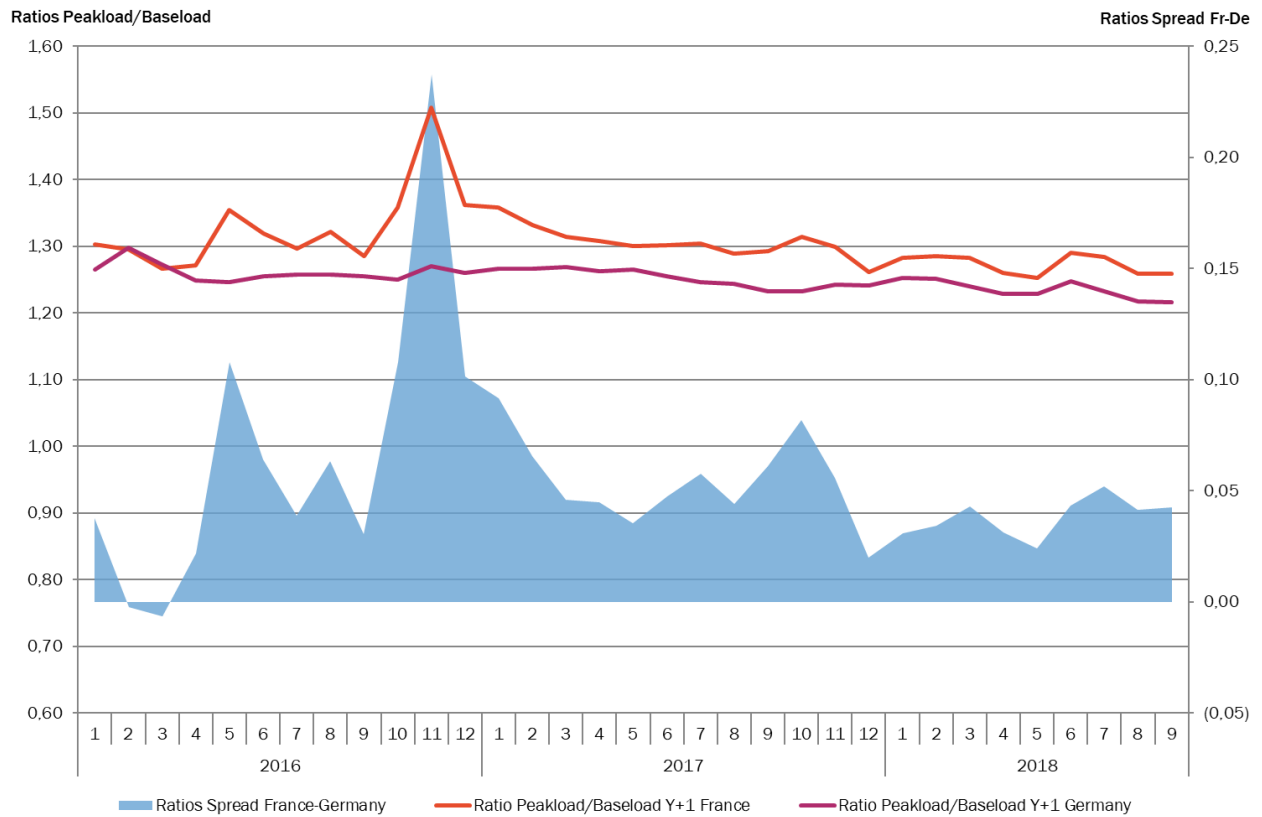
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Source : EEX Power Derivatives, Courtiers – Analysis : CRE

Figure 13 : Ratio Peakload/Baseload of Y+1 calendar prices in France and Germany

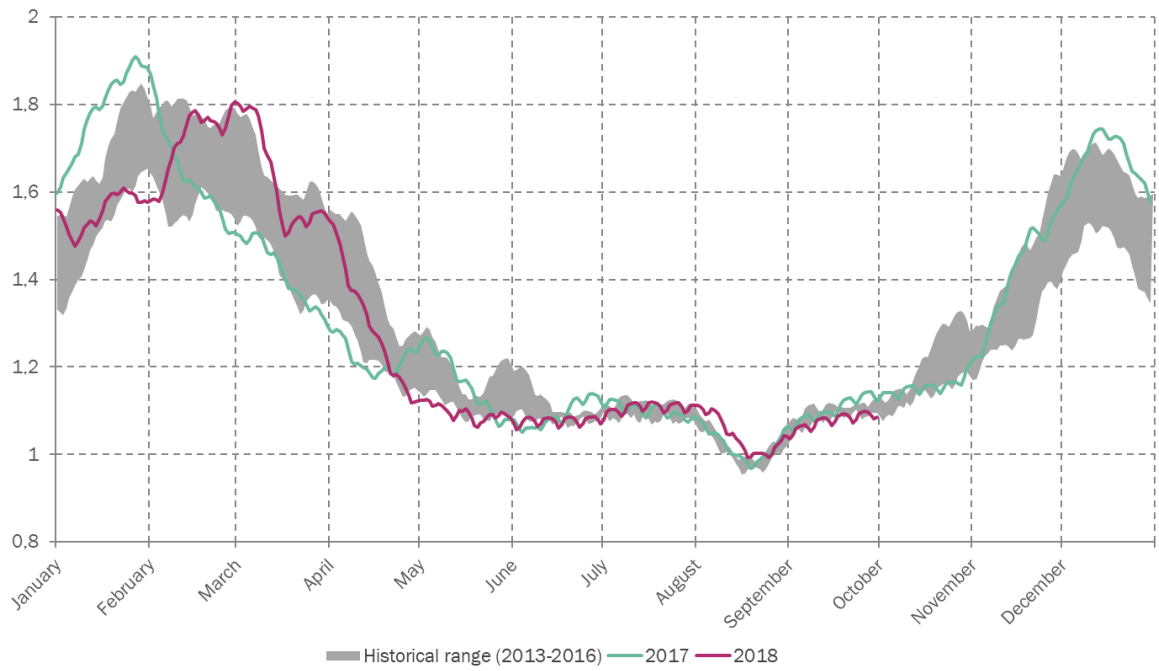
// MONTHLY AVERAGES //



Source : EEX Power Derivatives – Analysis : CRE

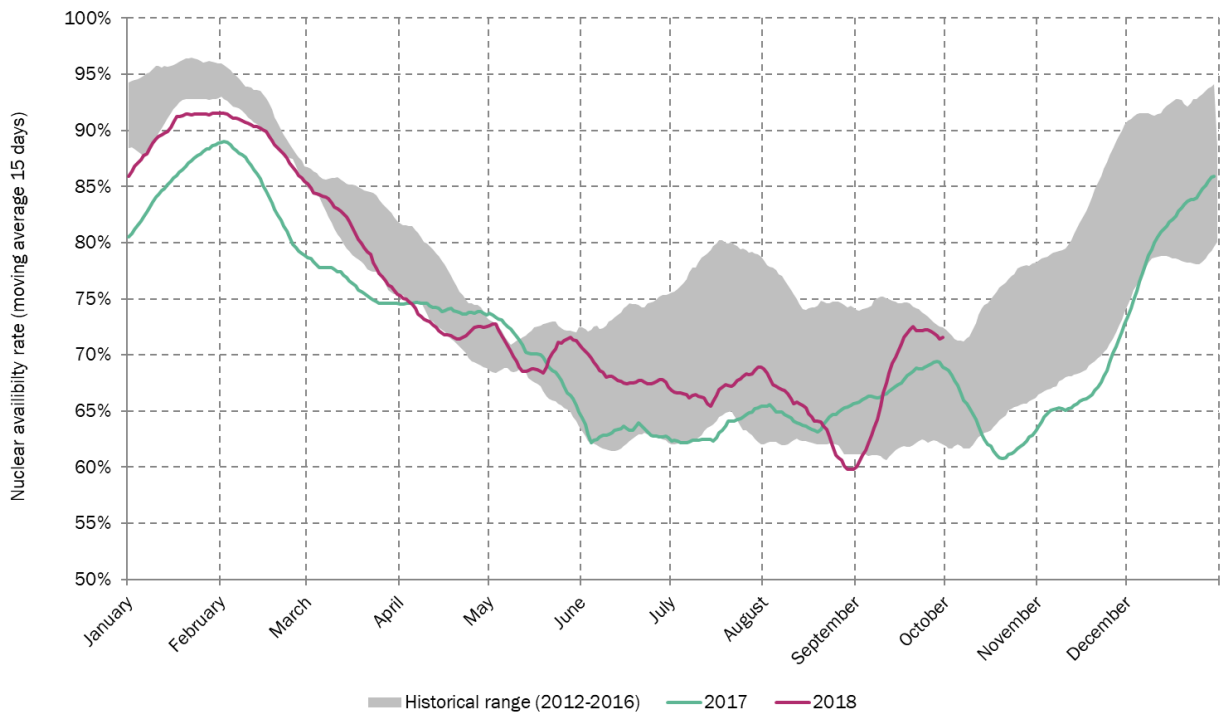
Figure 14 : French electricity consumption

Daily consumption (TWh) - moving average 15 days



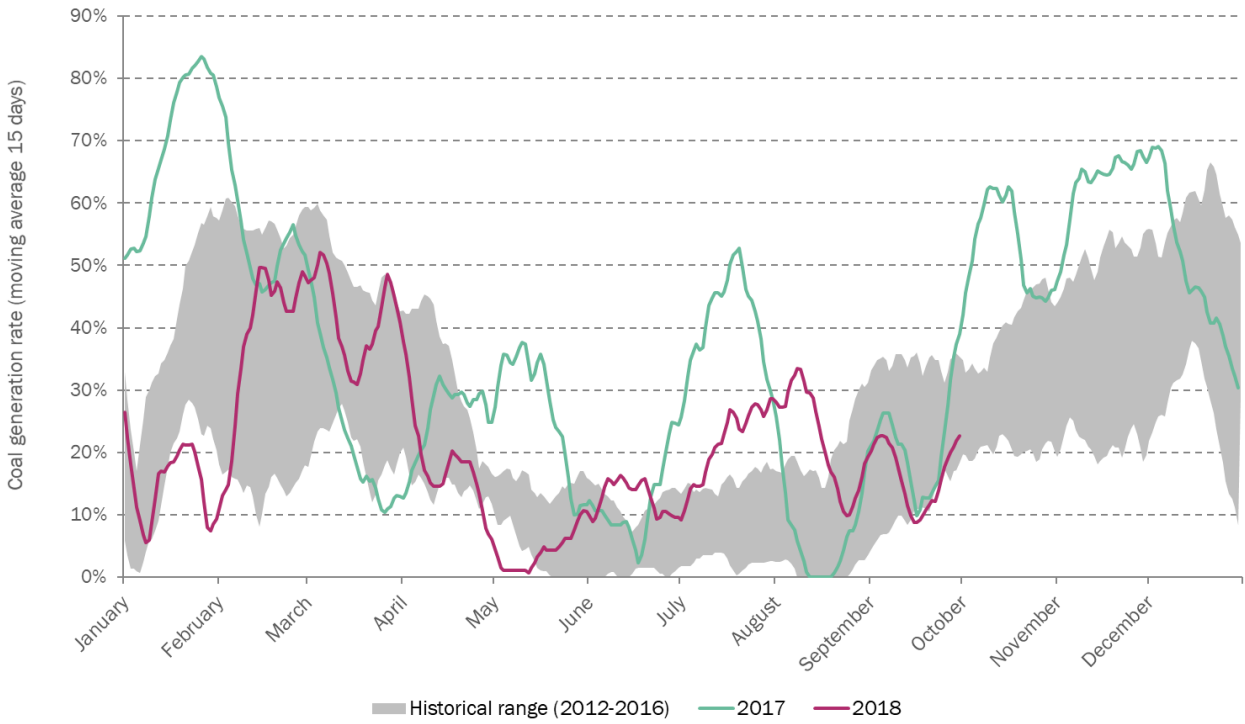
Source : RTE - Analysis : CRE

Figure 15 : Availability of nuclear generating capacity



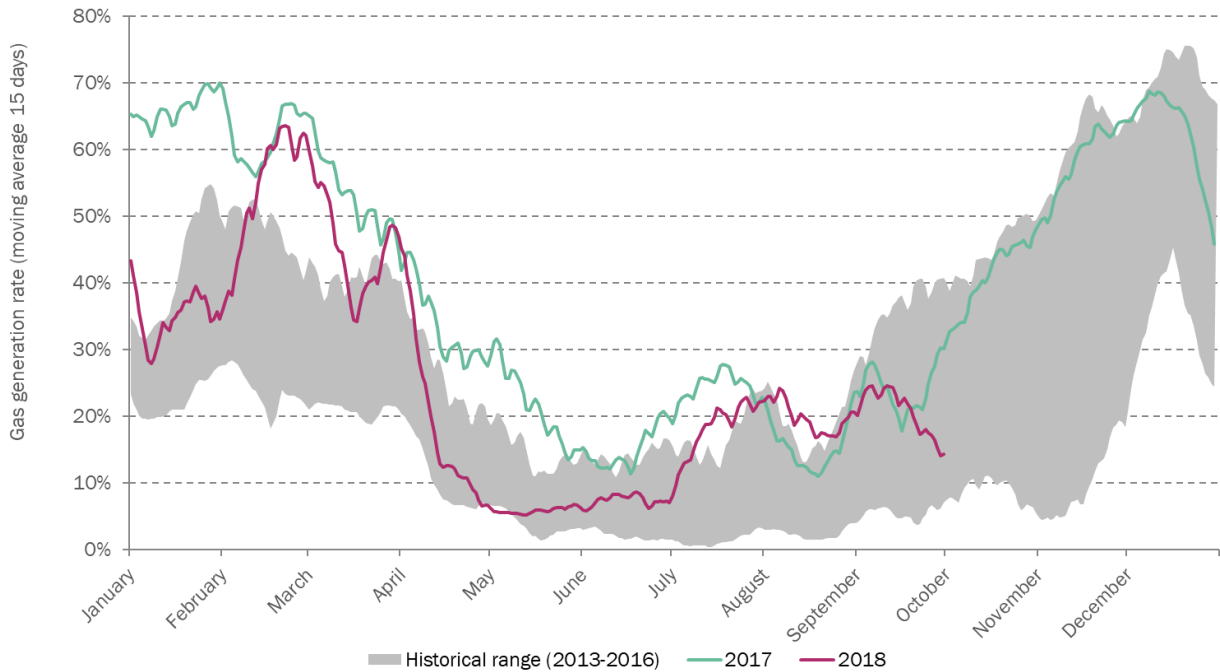
Source : RTE - Analysis : CRE

Figure 16 : Average coal generation rate



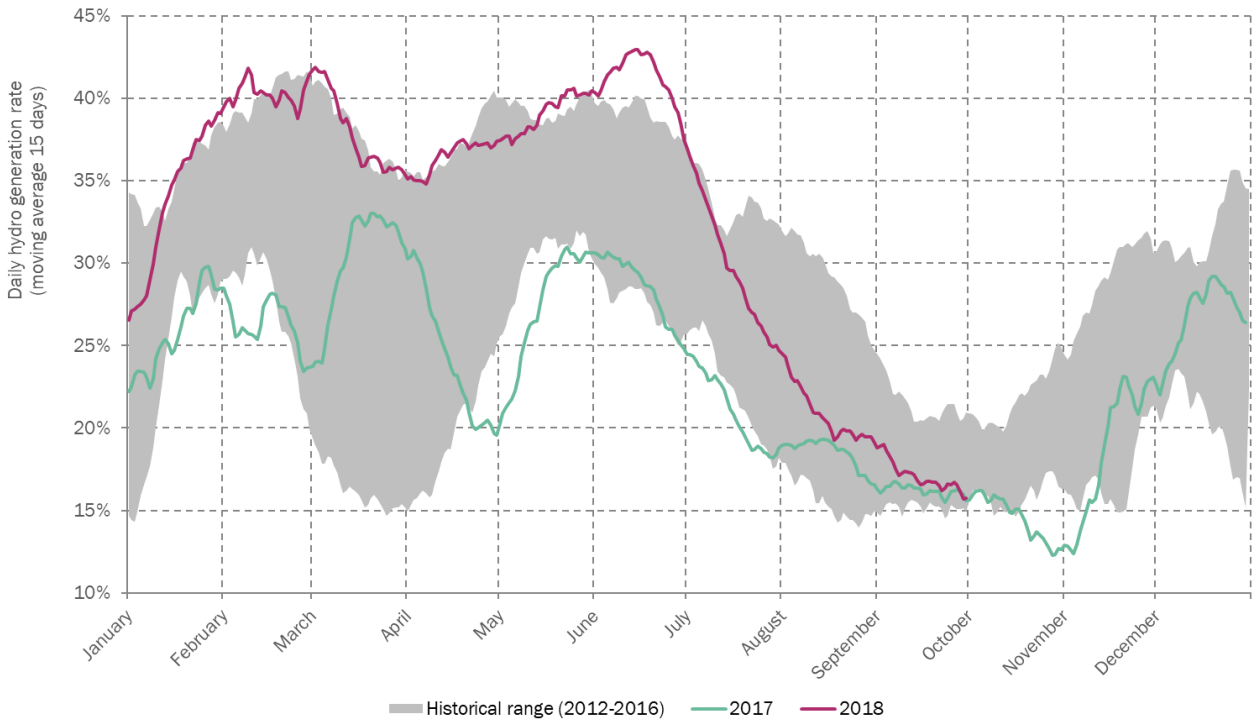
Source : RTE - Analysis : CRE

Figure 17 : Average gas generation rate



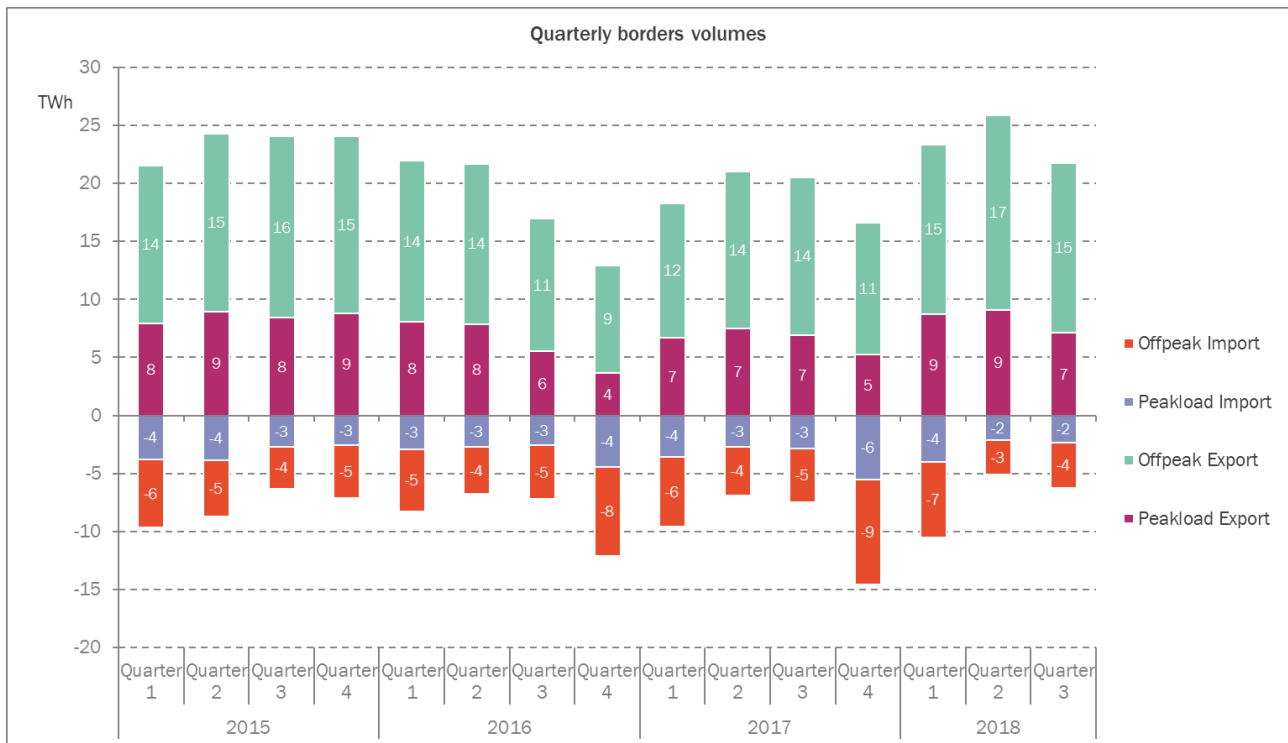
Source : RTE - Analysis : CRE

Figure 18 : Hydraulic generation rate



Source : RTE – Analysis : CRE

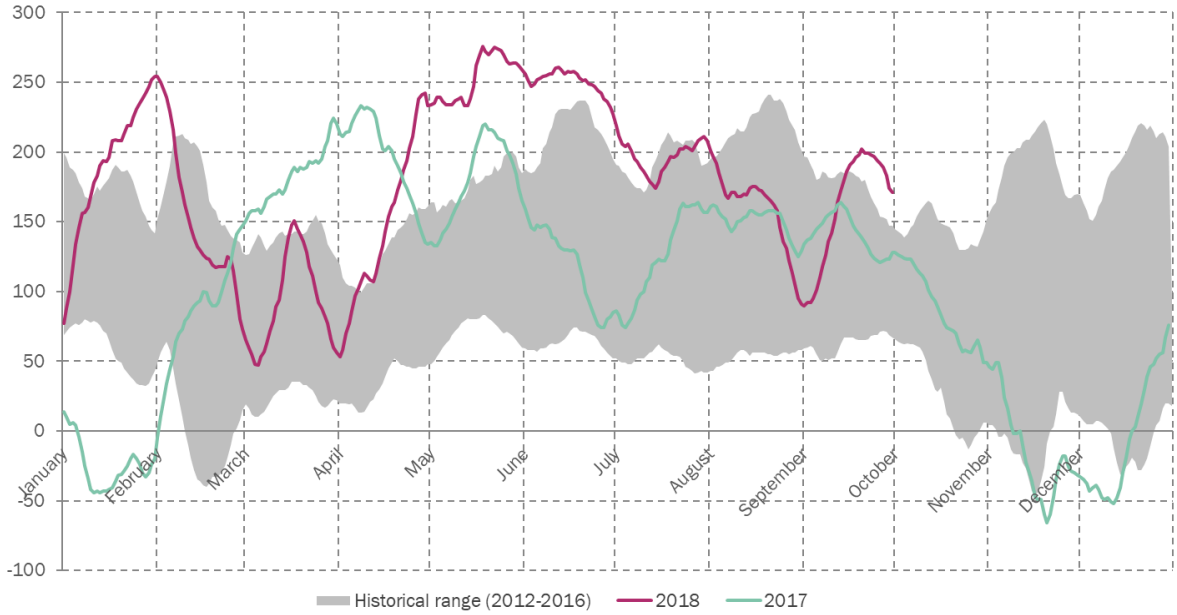
Figure 19 : Imports and exports (peak/Off-peak)



Source : RTE – Analysis : CRE

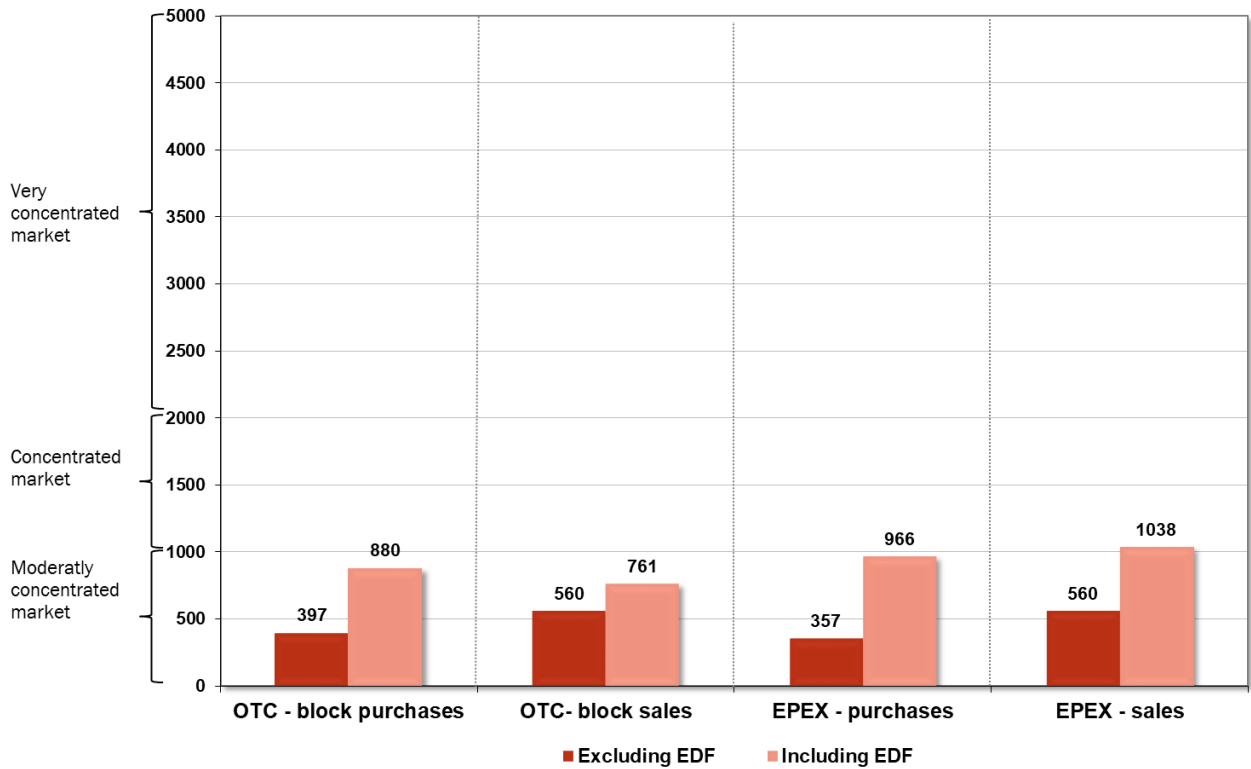
Figure 20 : Export balance

Daily net exports (GWh)
moving average 15 days



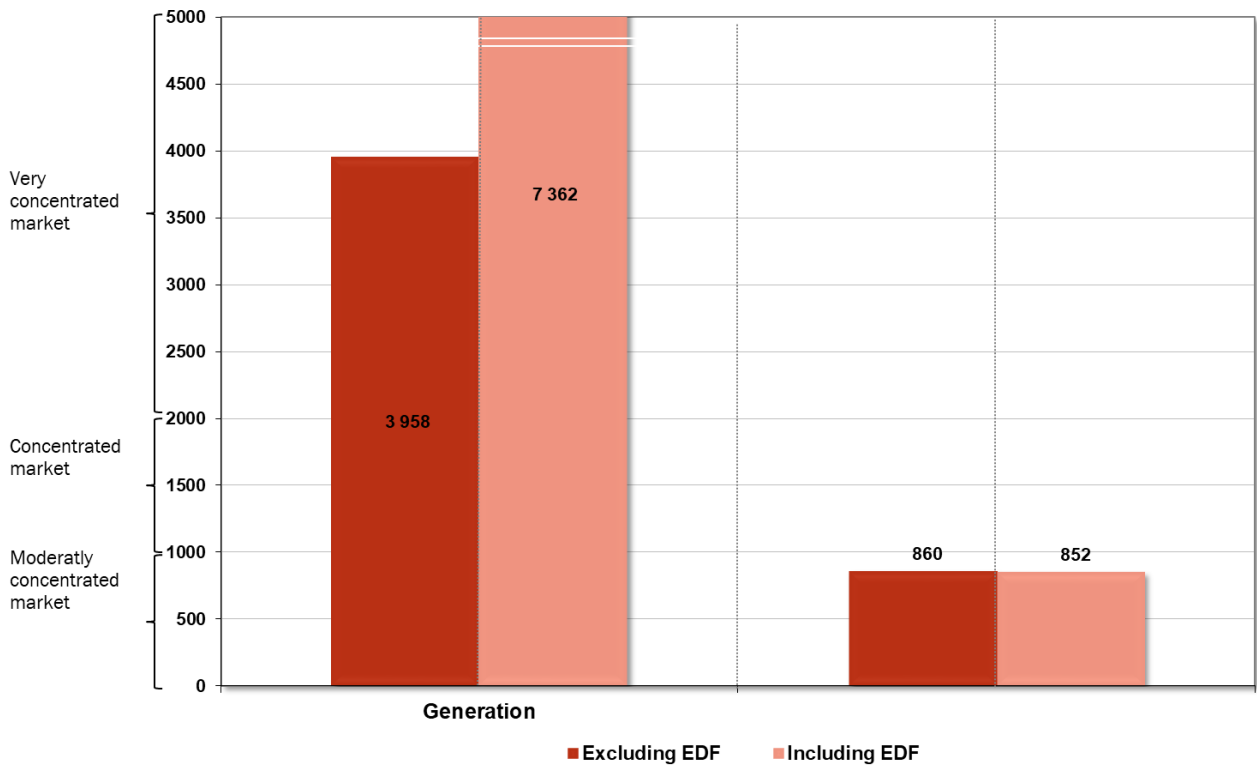
Source : RTE – Analysis : CRE

Figure 21 : HHI concentration index – Energy wholesale market in Q3 2018



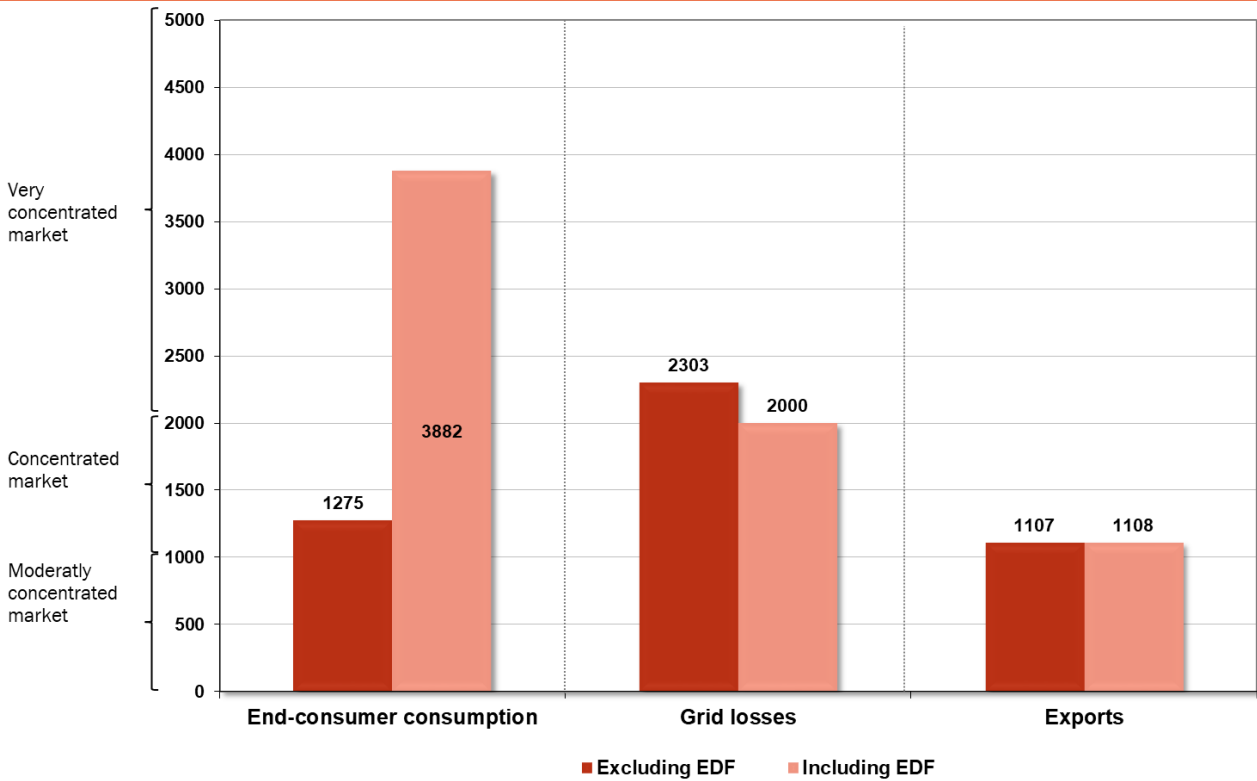
Source : EPEX SPOT, EEX Power Derivatives, Courtiers – Analysis : CRE

Figure 22 : HHI concentration index – Injections in Q3 2018



Source : RTE – Analysis : CRE

Figure 23 : HHI concentration index – Withdrawals in Q3 2018



Source : RTE – Analysis : CRE

PART 2: WHOLESALE NATURAL GAS MARKET

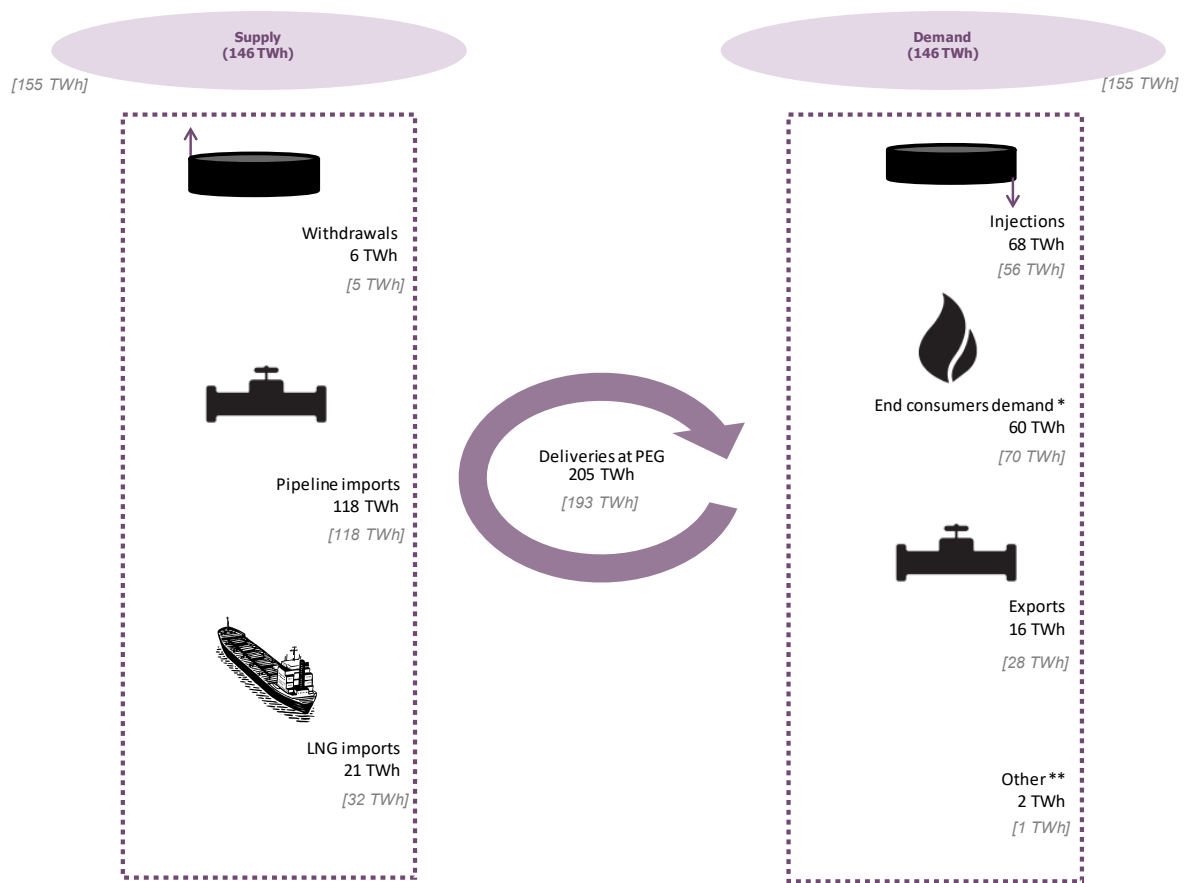
1. KEY DATES

2004	First publication of price references for the French gas markets
January 2005	Launch of the French Gas Release program on a volume of 16.3 TWh/yr during 3 years
April 2007	Launch of the platform Powernext Balancing GRTgaz designed as a market access for the TSO in order to cover its daily balancing needs
2008	Accessibility to the wholesale market for consumers directly connected to GRTgaz transmission system
November 2008	Launch of Powernext Gas Spot and Powernext Gas Futures
January 2009	Merger of the 3 balancing zones of GRTgaz in the North of France (Nord-H, East and West)
December 2009	GRTgaz starts covering part of its balancing needs on the Powernext Gas Spot platform (Powernext Balancing GRTgaz platform is abandoned)
November 2010	Commissioning of the Fos Cavaou LNG terminal at 100% of its capacity
December 2010	Commercialization of daily and monthly interconnection capacity between Zeebrugge and PEG Nord
January 2011	GRTgaz and Luxembourgish CREOS launch a market consultation for the development of firm interconnection capacity from France to Luxembourg
May 2011	Powernext launches a spread PEG Nord / PEG Sud contract on its platform Powernext Gas Spot
July 2011	GRTgaz and Powernext Gas Spot launch the first market coupling initiative in the European gas markets
December 2011	TIGF becomes a member of Powernext Gas Spot and starts covering a part of its daily balancing needs at PEG TIGF
February 2012	Elengy launches a reloading service at Montoir-de-Bretagne LNG terminal
February 2013	Powernext Gas Futures launches the TTF and spread PEG Nord/TTF contracts
April 2013	Launch of PRISMA, a joint capacity booking platform of major European Transmission System Operators Merger of the Nord-H and Nord-B balancing zones New capacities at the border between France and Spain. Total available capacities at Larrau interconnection passed from 70 to 165 GWh/d for entry and from 100 to 165 GWh/d for exit
May 2013	Powernext and EEX launch PEGAS, a natural gas trading cooperation allowing market participants to trade both exchanges' contracts on a common trading platform
June 2013	Launch of the auction Joint Transport Storage (JTS) mechanism for commercializing additional daily capacities at GRTgaz north-to-south link
October 2013	Powernext launches both a new Front Month contract at PEG Sud and its spread contract with PEG Nord's Front Month

March 2014	Decree N° 2014-328 modifying the rules for accessing French storages in order to improve the security of supply
July 2014	Powernext launches a 24/7 service on its spot platform
October 2014	Launch of an auction mechanism through the PRISMA platform for the capacity allocations at GRTgaz north/south link
April 2015	Creation of TRS (Trading Region South) resulting from the merging of PEG South and PEG TIGF
January 2017	Commissioning of the Dunkirk LNG terminal
July 2017	Decree of 31 July 2017 on the modalities for taking into account other modulation instruments for the application of the reporting and holding obligation and storage capacity of natural gas suppliers
November 2017	Early implementation of the locational spread mechanism (locational products involving the purchase or the sale of gas at a precise point of the network)
December 2017	The Taisnières H and Alveringhem network interconnection points (PIRs) became the Virtualys virtual interconnection point (PIV Virtualys): a single point for the transmission of gas between France and Belgium
February 2018	Launch of an auction mechanism for the allocation of storage capacities

2. BALANCE OF THE WHOLESALE GAS MARKET

Figure 24: Quarterly supply and demand of natural gas in France



* Consumption includes clients at both regulated and market based prices

** 'Others' includes TSOs and DSOs consumptions, metering errors and losses

Data [Q2 2018] and Q3 2018
 Source: GRTgaz, Teréga – Analysis: CRE

3. KEY DATA

Table 8: Fundamentals

Market fundamentals	Quarterly values					Quarterly variation		Yearly variation	
	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q3 2018 / Q2 2018		Q3 2018 / Q3 2017	
						In percentage	In value	In percentage	In value
Entry and exit flows									
Supply (TWh)	142	194	218	155	146	-6%	-9	0	3
Storages withdrawals	4	36	69	5	6	24%	1	45%	2
Imports	138	157	149	150	139	-7%	-10	1%	2
Pipeline	111	135	128	118	118	0%	0	7%	7
LNG	27	22	21	32	21	-34%	-11	-21%	-6
Demand (TWh)	142	194	218	155	146	-6%	-9	2%	3
Storages injections	46	9	3	56	68		12	49%	22
End consumer demand	62	163	187	70	60	-14%	-10	-3%	-2
Distribution consumers	24	102	135	39	22	-44%	-17	-10%	-2
Consumers connected to the transmission system	38	61	53	31	38	23%	7	1%	0
Exports	33	20	24	28	16	-43%	-12	-51%	-17
Other	2	2	4	1	2	51%	1	21%	0
Deliveries at PEG (TWh)	195	210	236	193	205	6%	12	5%	10
PEG Nord	160	179	198	162	166	2%	3	4%	6
TRS	35	32	38	30	40	30%	9	13%	5
Infrastructure figures									
North-to-South link	92%	97%	78%	99%	100%		1%		8%
Availability of the North-to-South link	81%	94%	92%	70%	73%		3%		-8%
Utilization of Virtualys (Entry)	57%	59%	45%	50%	46%		-4%		-11%
Utilization of Obergaibach interconnection (Entry)	64%	53%	56%	75%	46%		-29%		-19%
Stock levels (TWh as at the end of the Quarter)	98	70	4	12	30	152%	18	-69%	-68
Avg. Net variation of French stocks (GWh/j)	447	-303	-732	556	669	20%	113	50%	222
Avg. LNG terminals emissions (GWh/j)	293	240	238	352	229	-35%	-122	-22%	-64
Avg. Exports from France to Spain (GWh/j)	135	118	125	70	85	22%	16	-37%	-49

* Utilization of Taisnières H interconnection before 1st December 2017

Source: GRTgaz, Teréga – Analysis: CRE

Table 9: Prices

Prices	Quarterly values					Quarterly variation		Yearly variation	
	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q3 2018 / Q2 2018		Q3 2018 / Q3 2017	
						In percentage	In value	In percentage	In value
Spot prices (€/MWh)									
PEG Nord day-ahead (avg.)	16,0	19,6	21,2	21,0	24,4	16%	3,4	52%	8,4
TRS day-ahead (avg.)	16,2	22,2	21,2	22,8	27,0	18%	4,1	66%	10,7
Day-ahead PEG Nord/Sud spread (avg.)	0,3	2,6	0,0	1,9	2,6	39%	0,7	920%	2,3
Day-ahead PEG Nord/TTF Spread (avg.)	-0,1	0,4	-0,3	-0,1	-0,2	26%	0,0	23%	0,0
Forward prices (€/MWh)									
PEG Nord M+1 (avg.)	15,9	19,9	19,0	20,9	24,6	18%	3,7	55%	8,8
PEG Nord Y+1 (avg.)	16,6	18,2	17,4	19,8	22,9	16%	3,1	38%	6,3
M+1 PEG Nord/Sud spread (avg.)	0,8	4,0	0,6	0,8	2,7	223%	1,9	238%	1,9
M+1 PEG Nord/TTF spread (avg.)	0,2	0,3	0,3	0,2	0,3	25%	0,1	32%	0,1
Summer-ahead/Winter-ahead spread * (avg.)	1,4	1,5	1,3	0,9	0,7	-18%	-0,2	-45%	-0,6

* During the winter season, this indicator corresponds to the spread between winter-ahead and summer-ahead prices. During the summer season, it corresponds to the spread between winter-ahead and Balance of summer prices (calculated from contracts delivering during the rest of the summer)

Source: Powernext, ICIS Heren – Analysis: CRE

Table 10: Trading Activity

Trading activity	Quarterly values					Quarterly variation		Yearly variation	
	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Q3 2018	Q3 2018 / Q2 2018		Q3 2018 / Q3 2017	
						In percentage	In value	In percentage	In value
Activity in the French wholesale gas markets									
Natural gas exchanged at PEG* (TWh)	144	150	175	142	145	2%	3	1%	2
% of national consumption	232%	92%	93%	205%	244%				
Trading volumes in the French intermediated markets									
Spot market (TWh)	39	50	60	46	44	-5%	-2	13%	5
Intraday	6	9	10	7	7	-9%	-0.6	17%	1.0
Day Ahead	23	28	31	24	23	-3%	-0.8	2%	0.4
Exchange (DA, WD, WE, other spot)	33	45	53	38	37	-4%	-1.7	11%	3.5
Brokers (DA, WD, WE, other spot)	6	5	7	8	7	-10%	-0.8	27%	1.5
Forwards market (TWh)	100	68	186	80	79	-2%	-2	-21%	-21
M+1	31	21	24	21	19	-6%	-1.2	-37%	-11.4
Q+1	4	15	2	11	8	-34%	-3.9	83%	3.4
S+1	12	14	75	14	11	-23%	-3.2	-11%	-1.3
Y+1	9	4	10	3	2	-27%	-0.8	-75%	-6.8
Exchange (all maturities)	8	3	4	3	2	-26%	-0.7	-74%	-5.6
Brokers (all maturities)	92	65	181	78	77	-1%	-1.0	-17%	-15.6
Number of transactions in the French intermediated markets									
Spot market	29541	41303	45148	36358	35209	-3%	-1149	19%	5668
Intraday	6 864	8 618	9 319	7 766	7 570	-3%	-196	10%	706
Day Ahead	18 628	26 877	28 584	22 588	21 975	-3%	-613	18%	3347
Exchange (DA, WD, WE, other spot)	27 486	39 574	43 577	33 535	32 398	-3%	-1137	18%	4912
Brokers (DA, WD, WE, other spot)	2 055	1 729	1 571	2 823	2 811	0%	-12	37%	756
Forwards market	1478	1040	1648	1022	941	-8%	-81	-36%	-537
M+1	954	605	811	561	473	-16%	-88	-50%	-481
Q+1	63	191	24	105	71	-32%	-34	13%	8
S+1	73	52	300	60	46	-23%	-14	-37%	-27
Y+1	44	15	39	16	14	-13%	-2	-68%	-30
Exchange (all forwards)	303	147	176	157	94	-40%	-63	-69%	-209
Brokers (all forwards)	1 175	893	1 472	865	847	-2%	-18	-28%	-328
Concentration of the natural gas market in France									
Number of shippers active in the market	98	107	103	98	97	-1%	-1	-1%	-1
Active in Powernext Gas Spot	56	56	58	56	55	-2%	-1	-2%	-1
Active in Powernext Gas Futures	31	28	31	32	29	-9%	-3	-6%	-2

* Deliveries resulting from exchanges in the intermediated markets in France

Source: GRTgaz, Teréga, Powernext, Brokers – Analysis: CRE

4. FIGURES

4.1 Evolution of natural gas prices in France and Europe

Figure 25: Day-ahead prices in the main wholesale markets in Europe

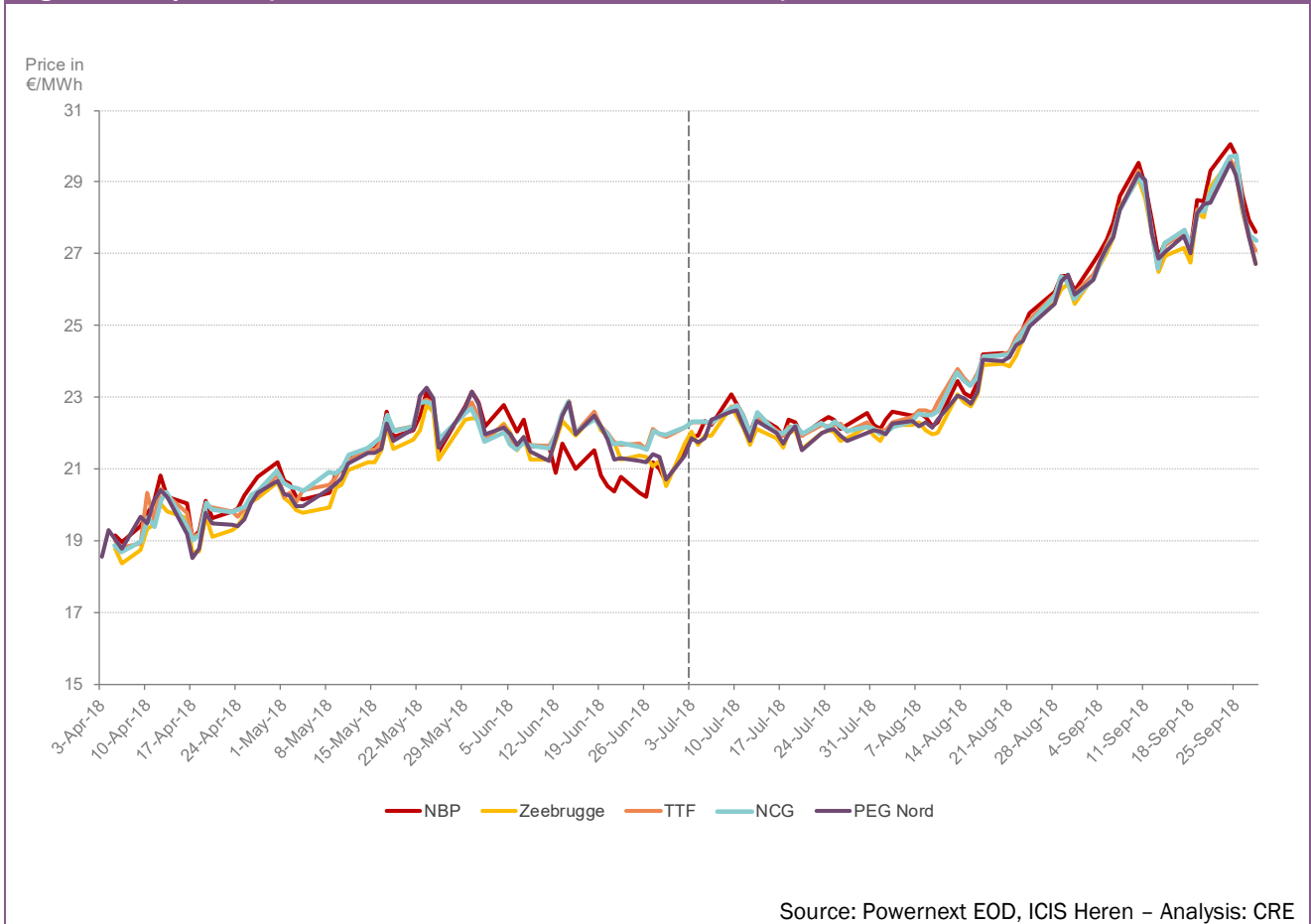
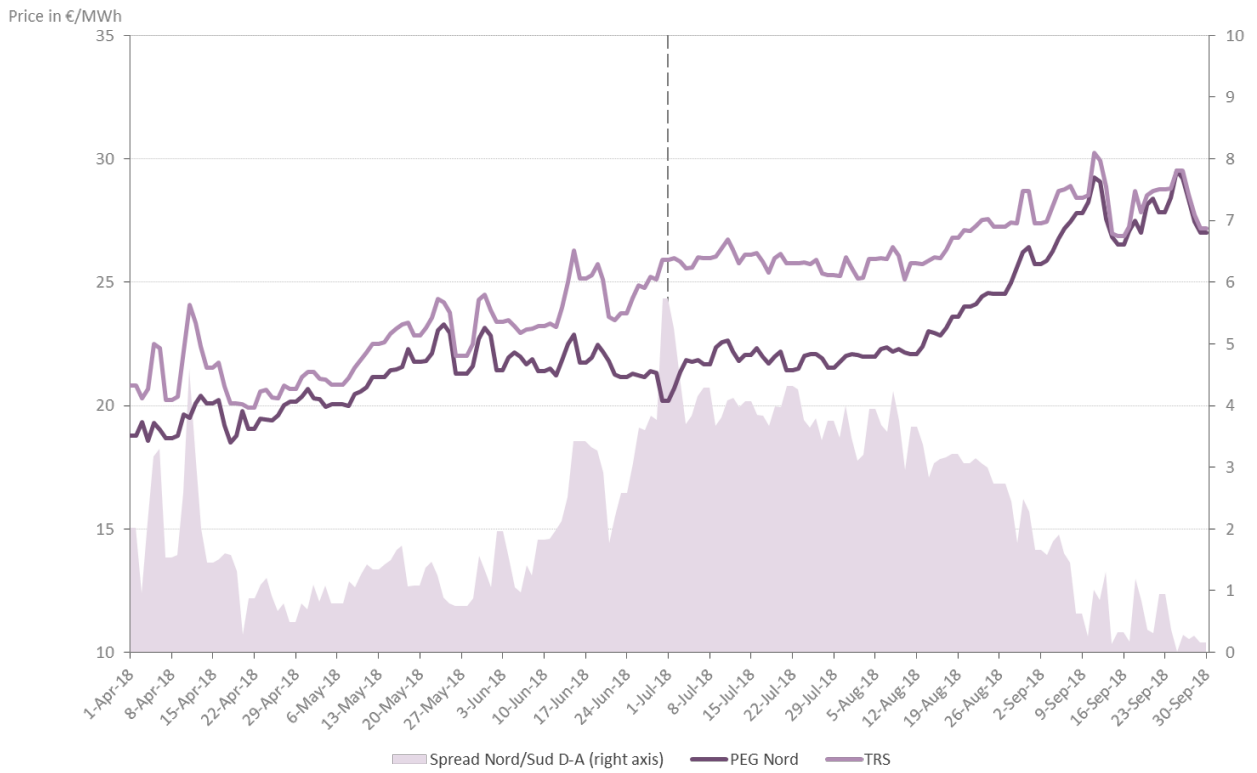


Figure 26: Day-ahead prices in the wholesale market in France



Source: Pownext EOD, ICIS Heren for TRS – Analysis: CRE

Figure 27: Year-ahead prices in the main wholesale markets in Europe

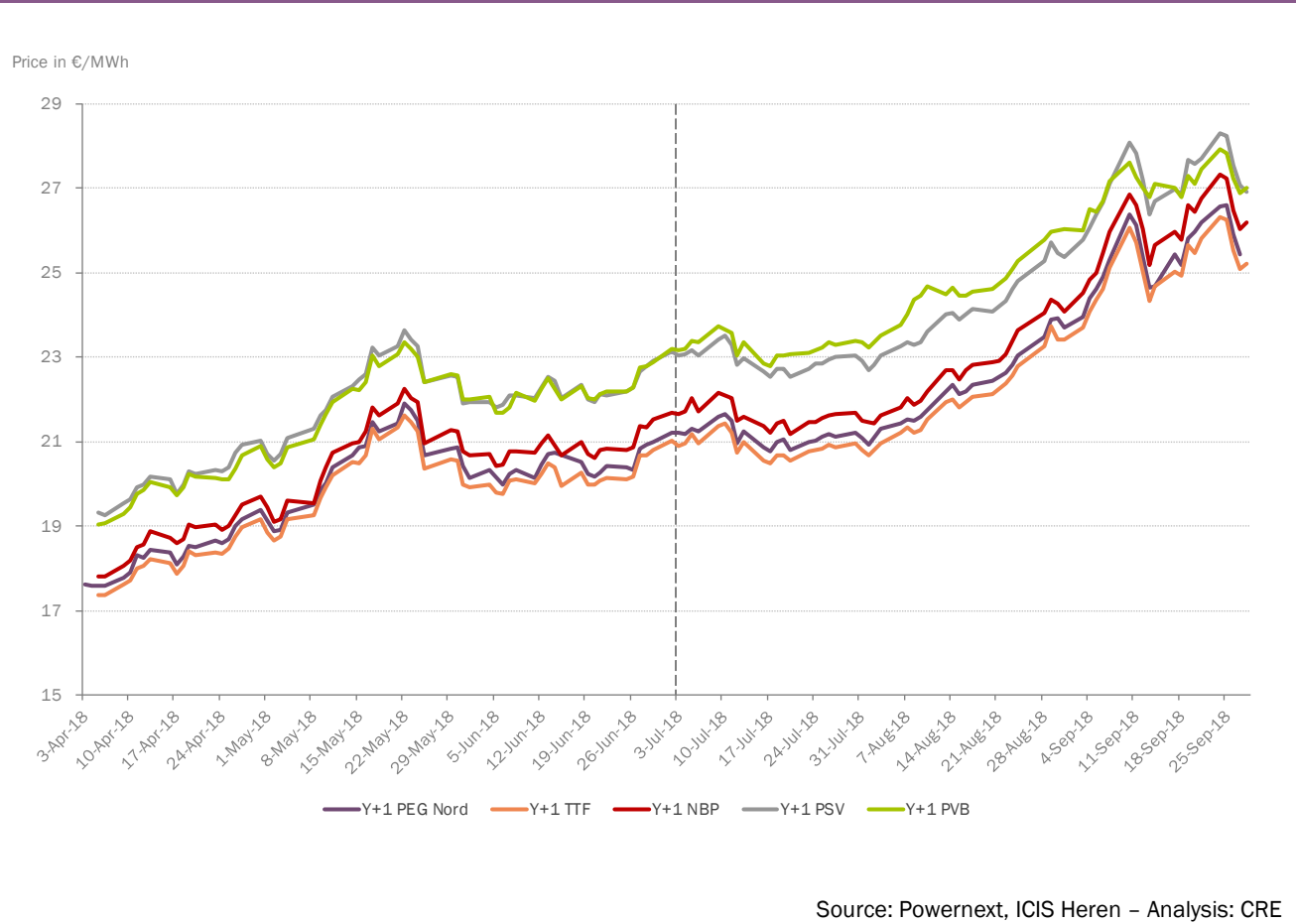
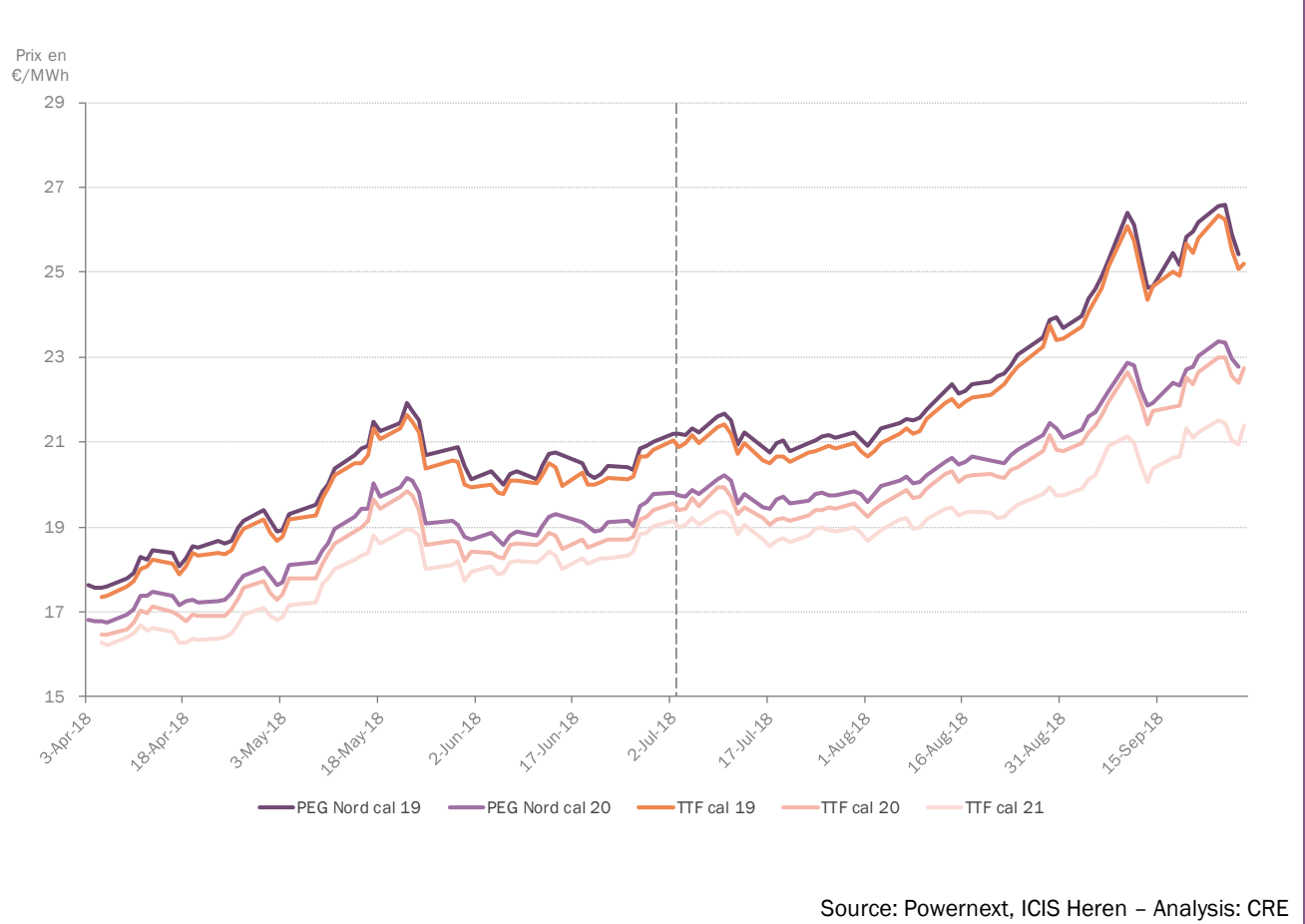
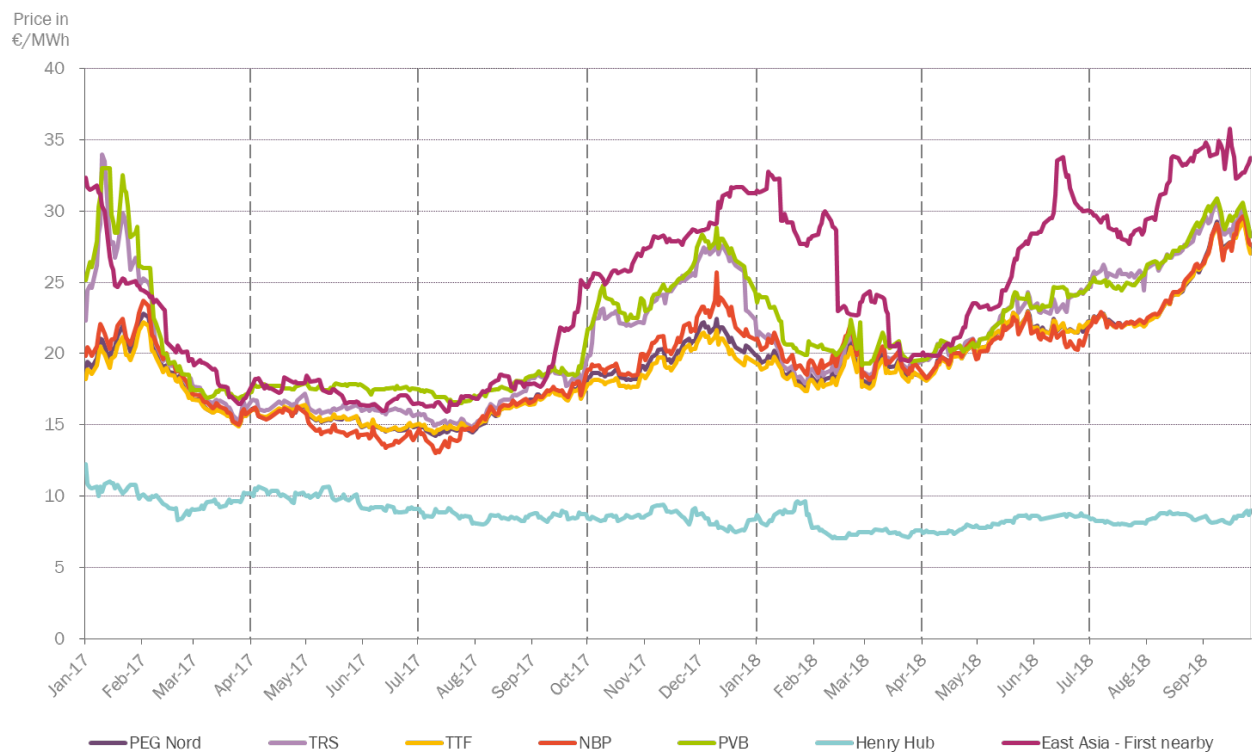


Figure 28: Price of calendar-year contracts for PEG Nord and TTF



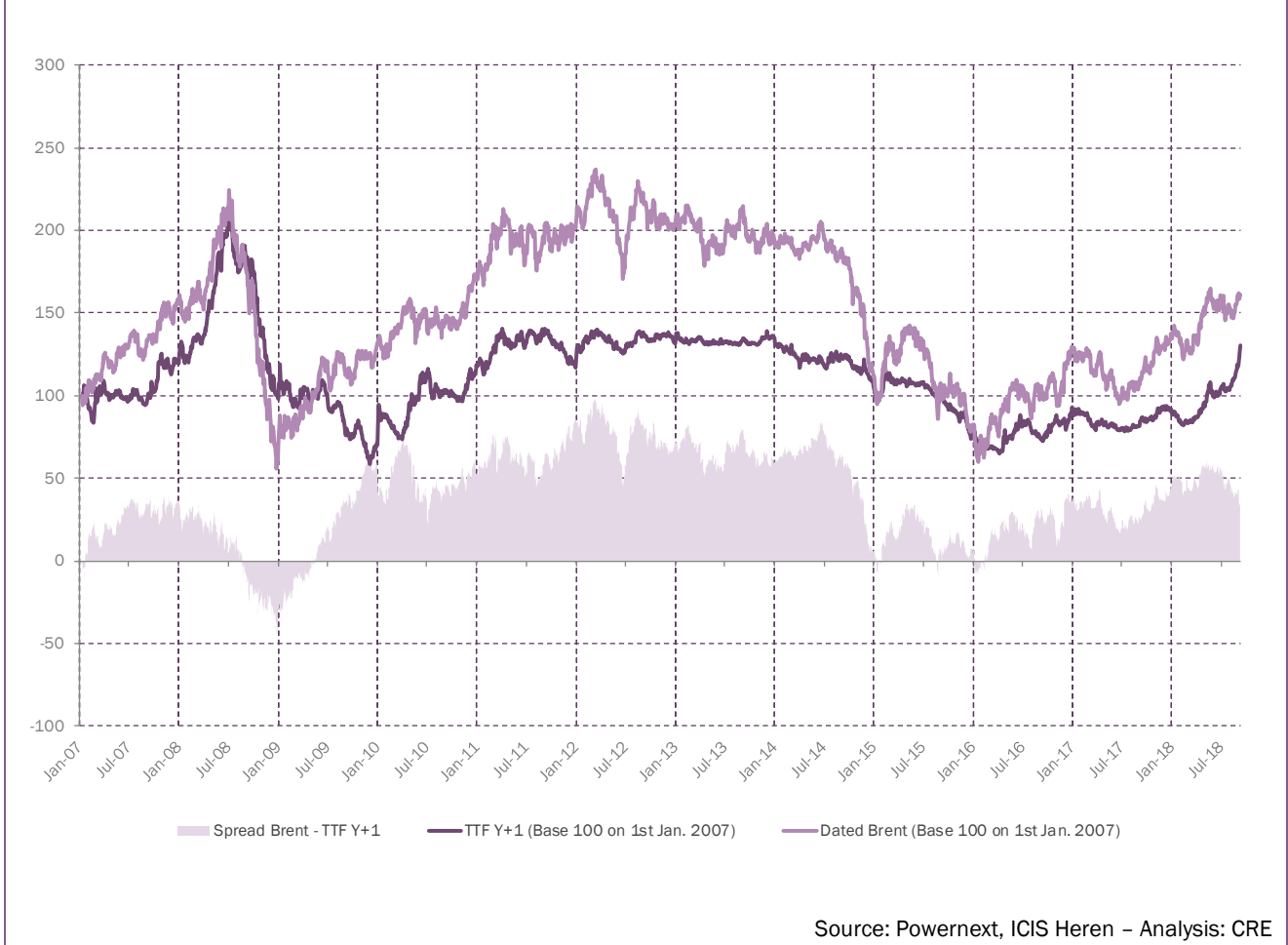
4.2 Global markets

Figure 29: International month-ahead natural gas prices



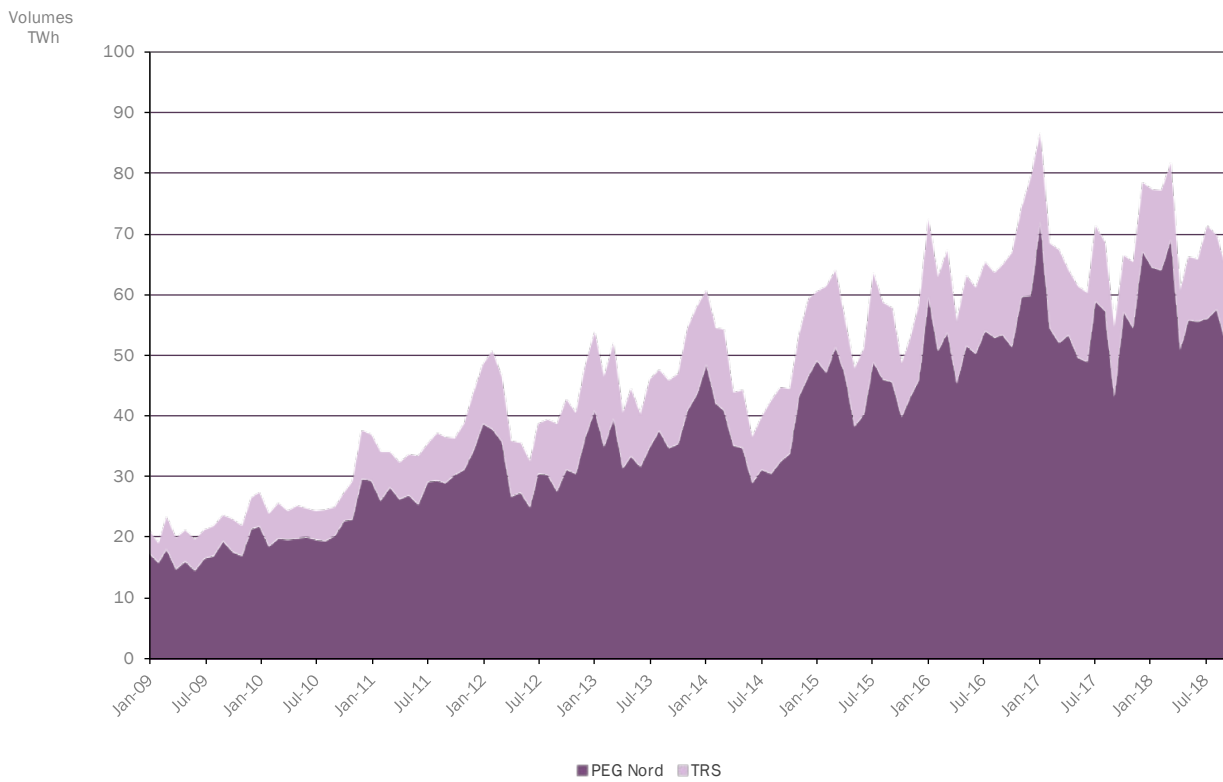
Source: Powernext, ICIS Heren – Analysis: CRE

Figure 30: Comparison between natural gas and oil prices



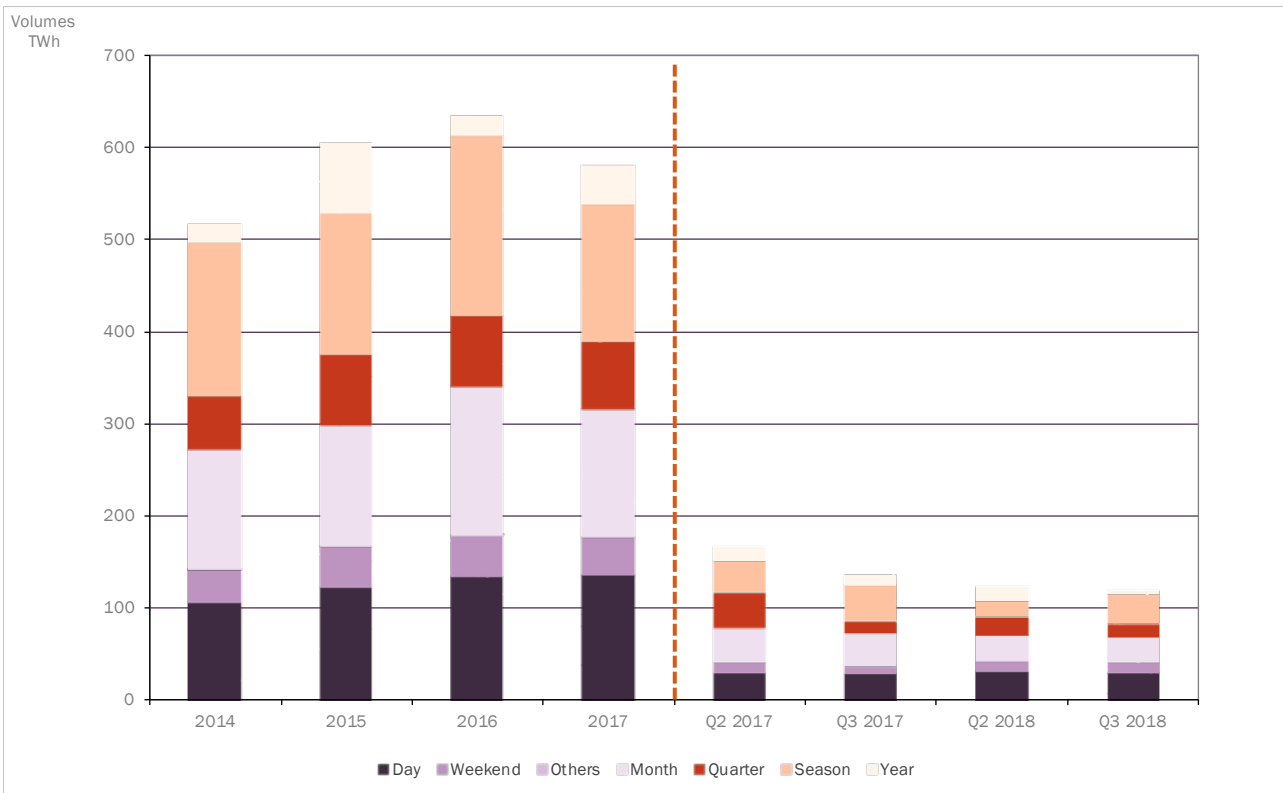
4.3 Development of the French natural gas markets

Figure 31: Deliveries at PEGs



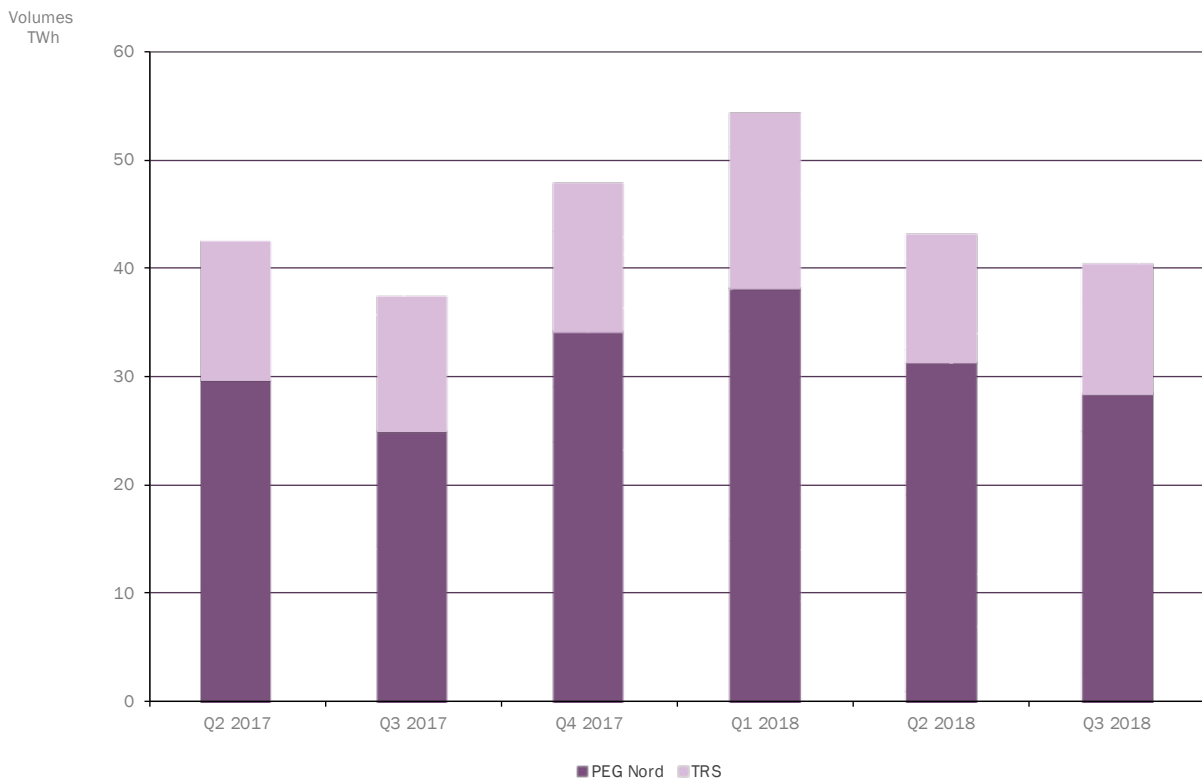
Source: GRTgaz, Teréga – Analysis: CRE

Figure 32: Trading volumes in the intermediated markets by contract



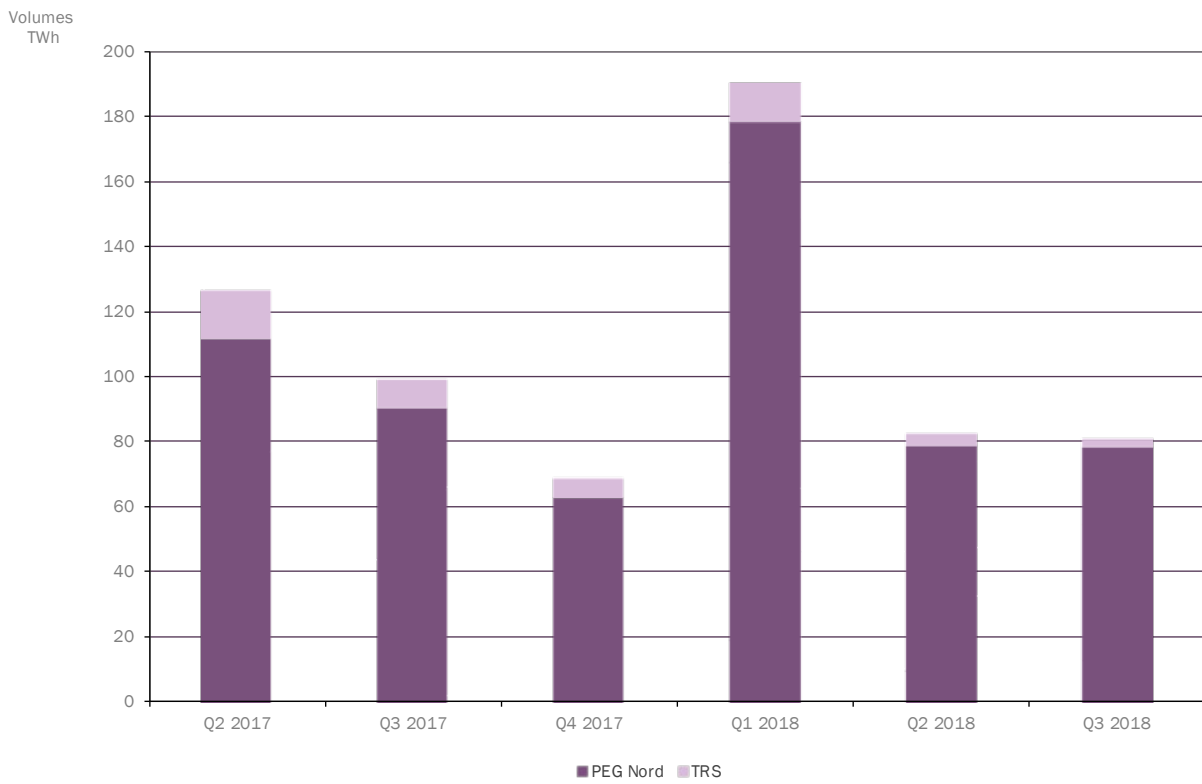
Source: Powernext, Brokers – Analysis: CRE

Figure 33: Trading volumes in the spot markets by zone



Source: Powernext, Brokers – Analysis: CRE

Figure 34: Trading volumes in the forward markets by zone



Source: Powernext, Brokers – Analysis: CRE

Figure 35: Trading volumes in the spot markets by type of intermediation

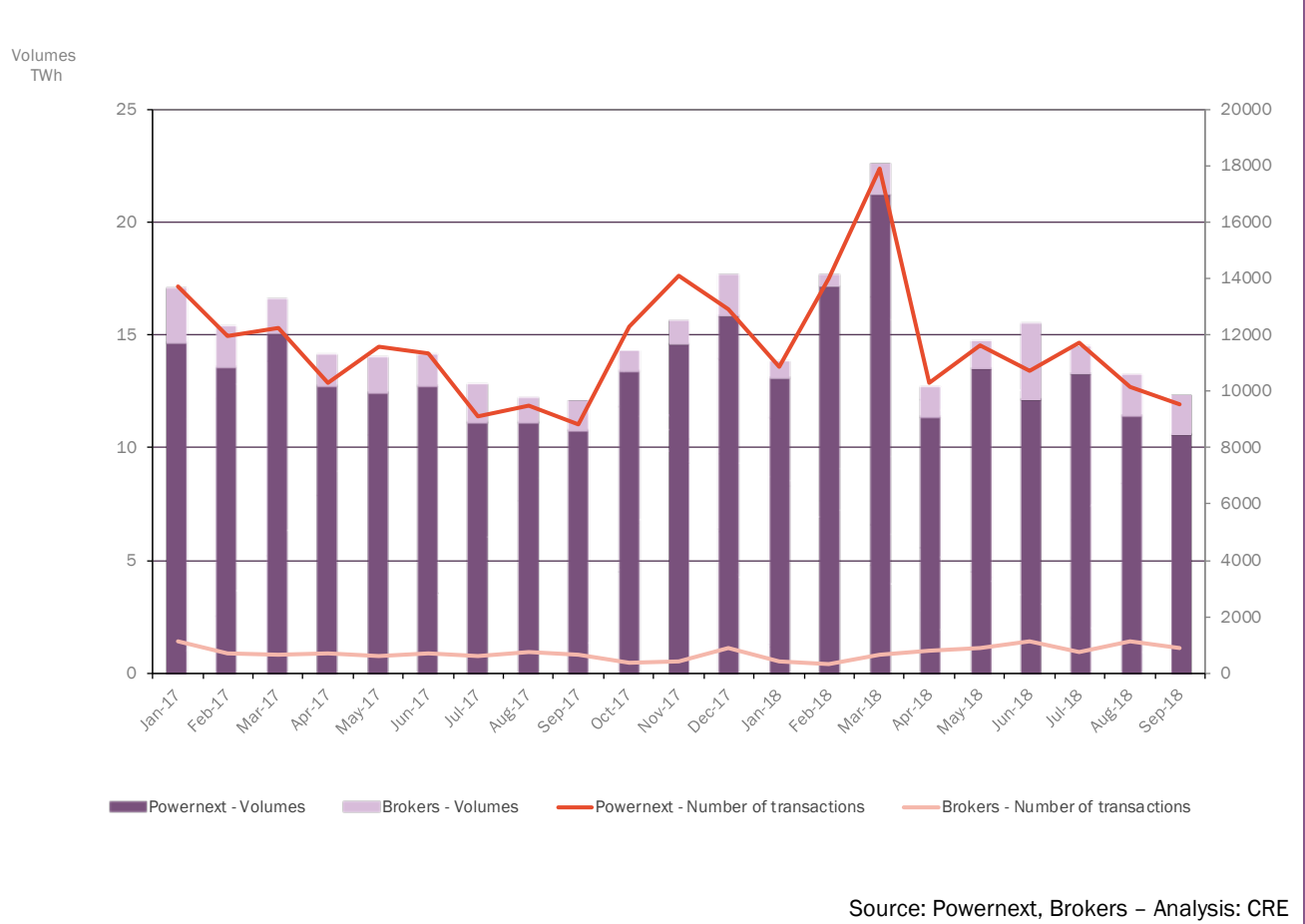


Figure 36: Trading volumes in the forward markets by type of intermediation

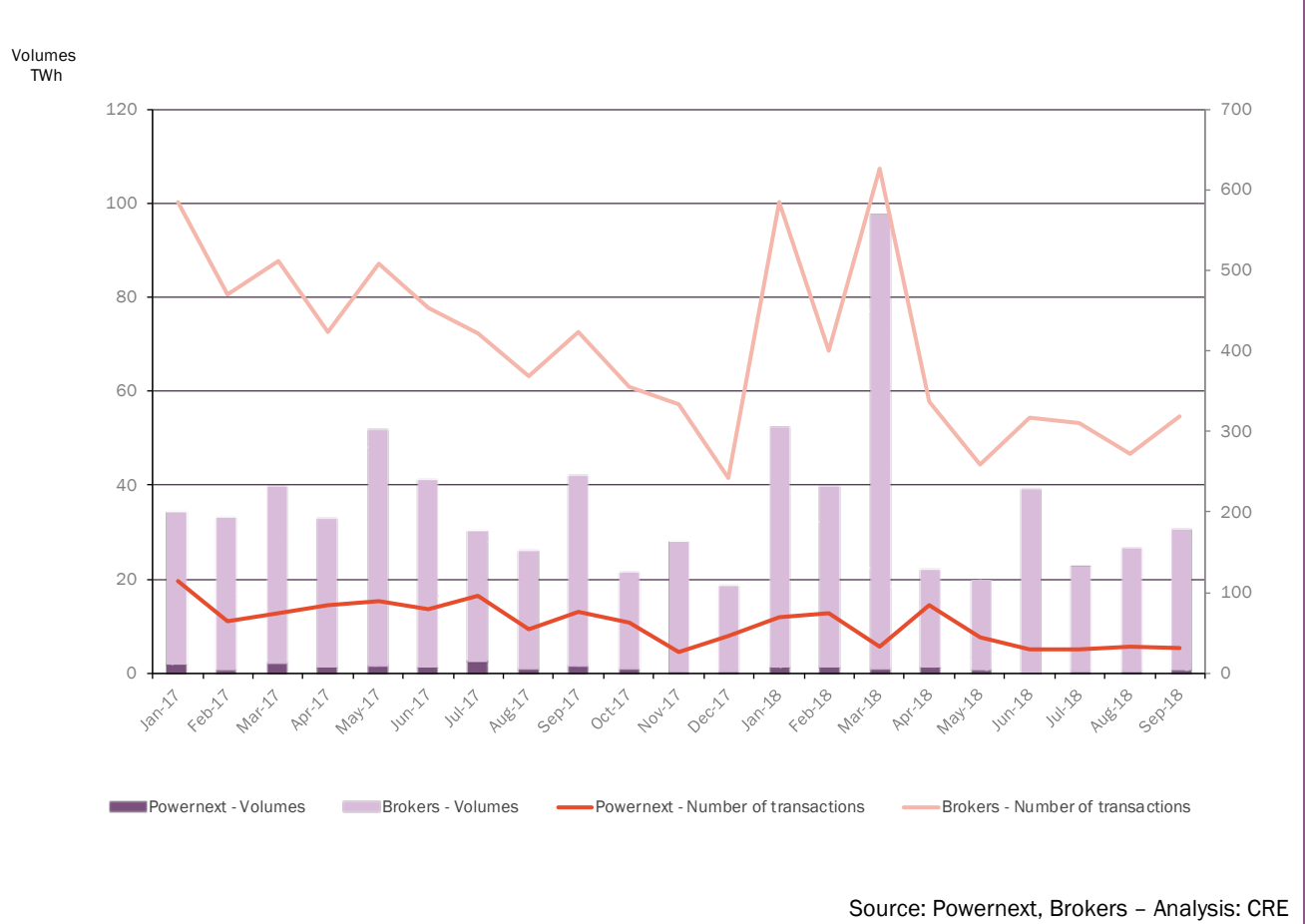
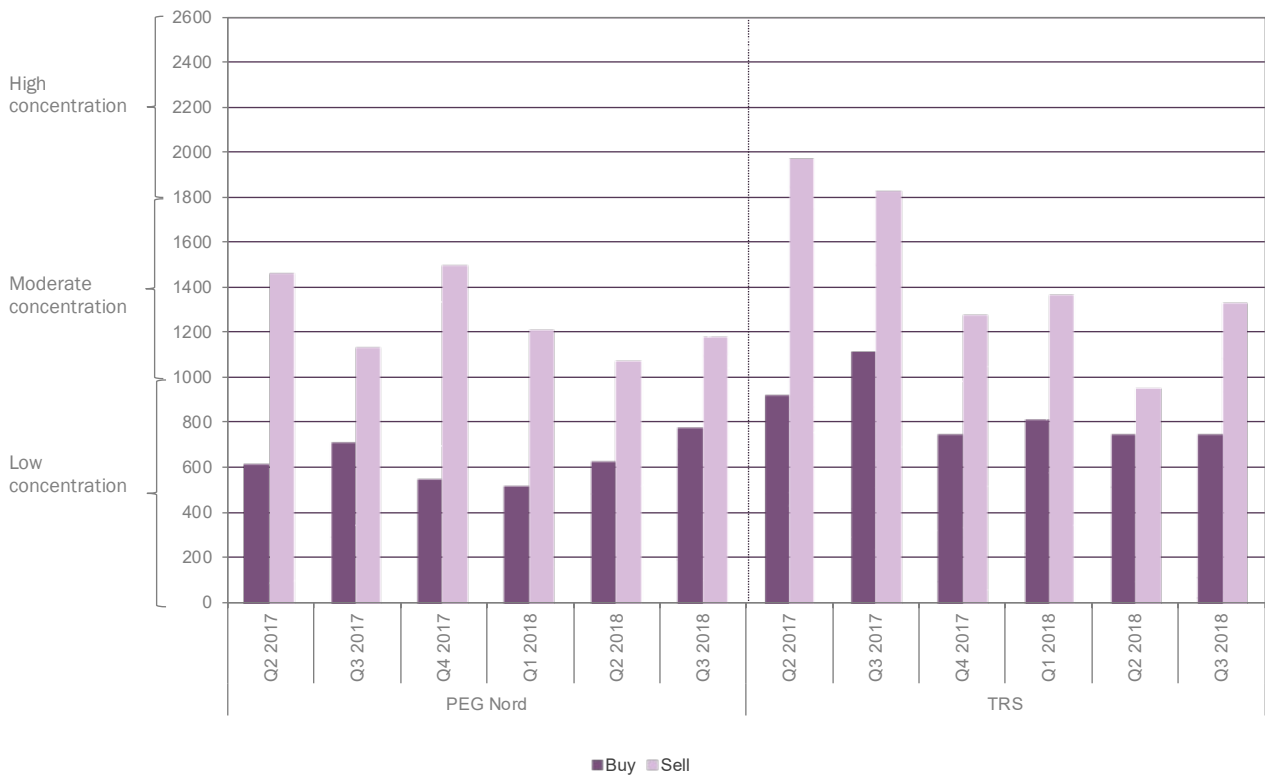
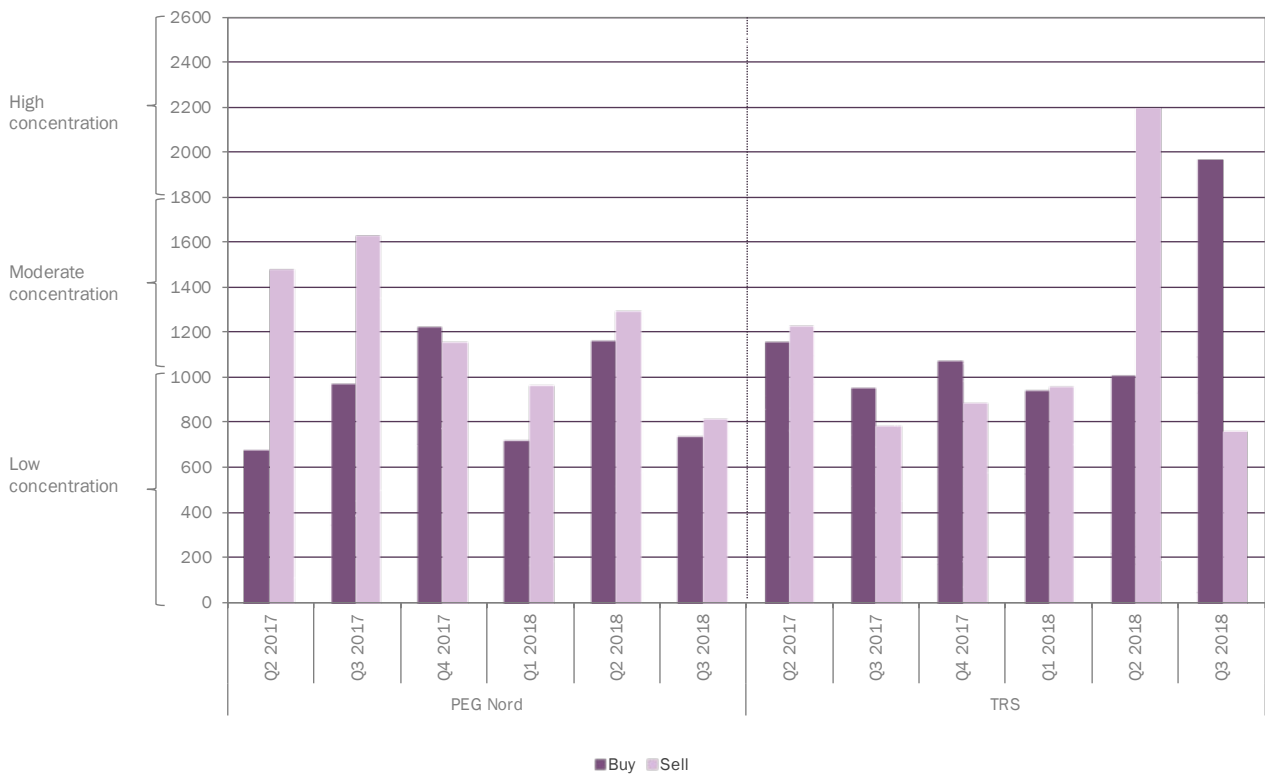


Figure 37: Concentration indexes in France on the spot market, by zone



Source: Pownext, Brokers – Analysis: CRE

Figure 38: Concentration indexes in France, by zone



Source: Powernext, Brokers – Analysis: CRE

4.4 Market fundamentals

Figure 39: Natural gas consumption in France

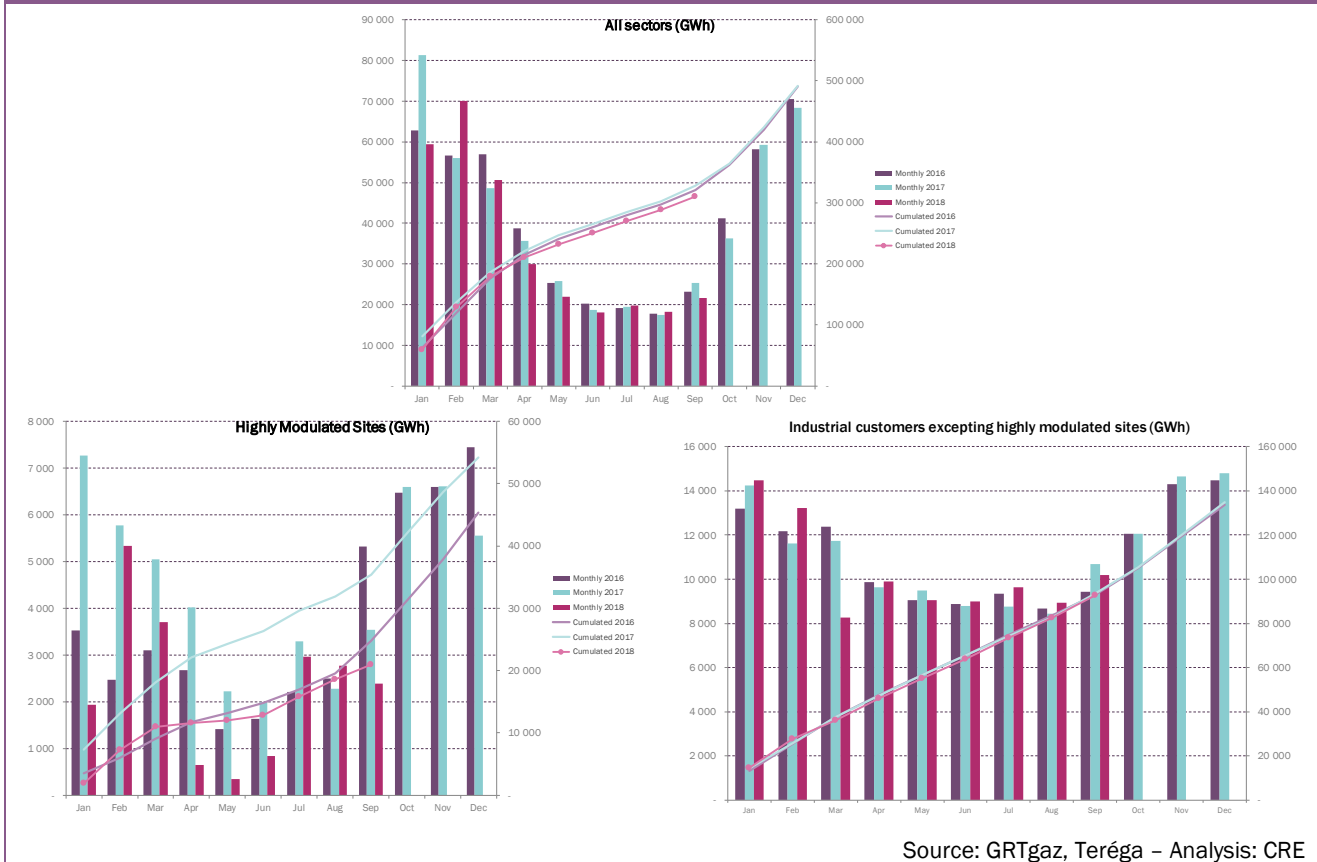
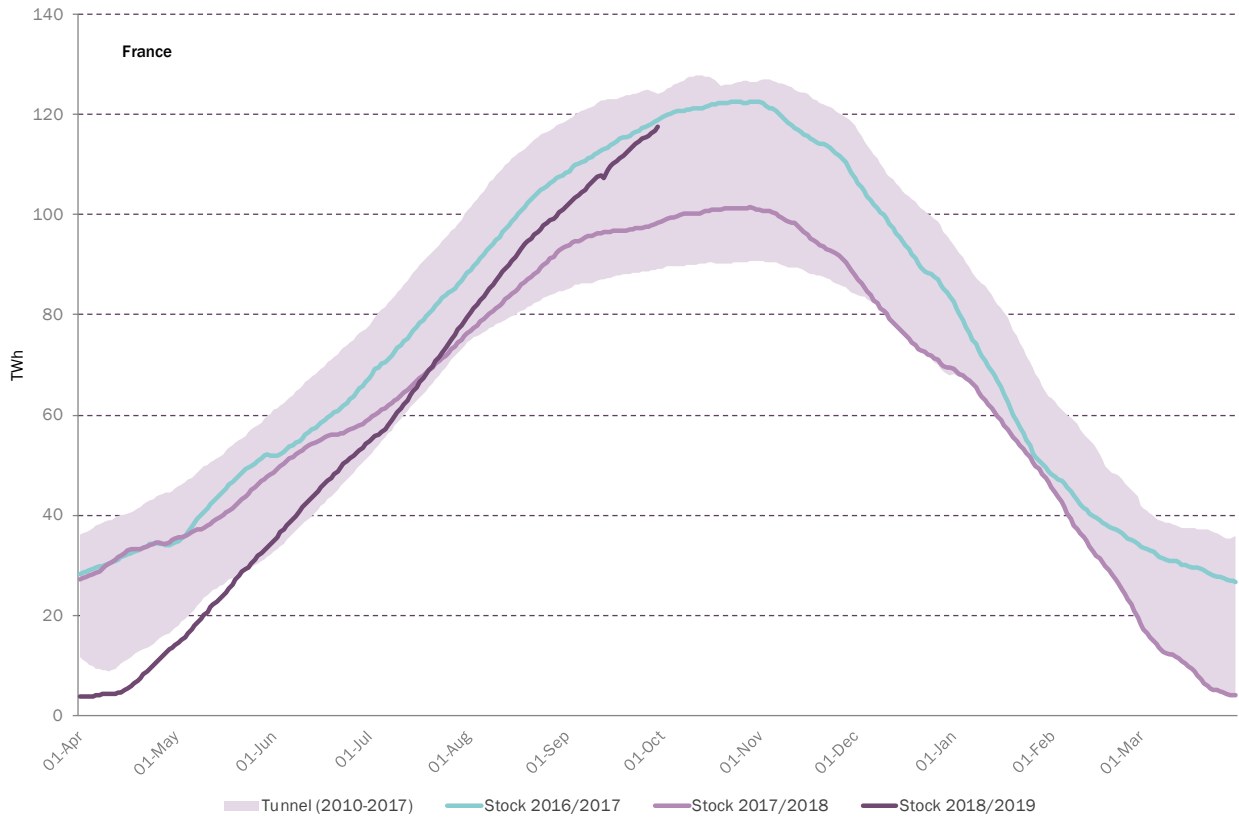
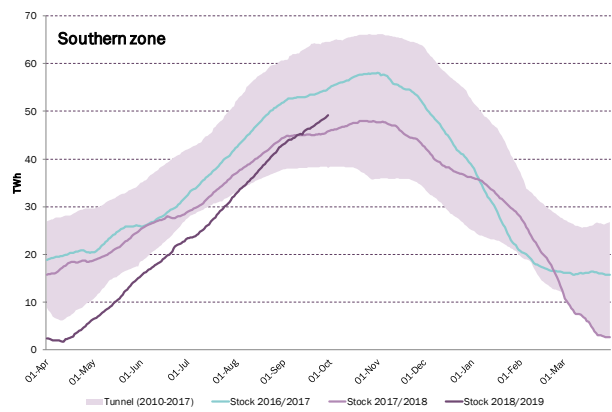
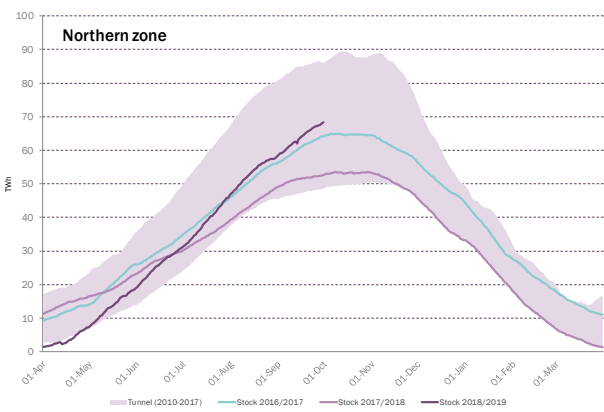


Figure 40: French stocks



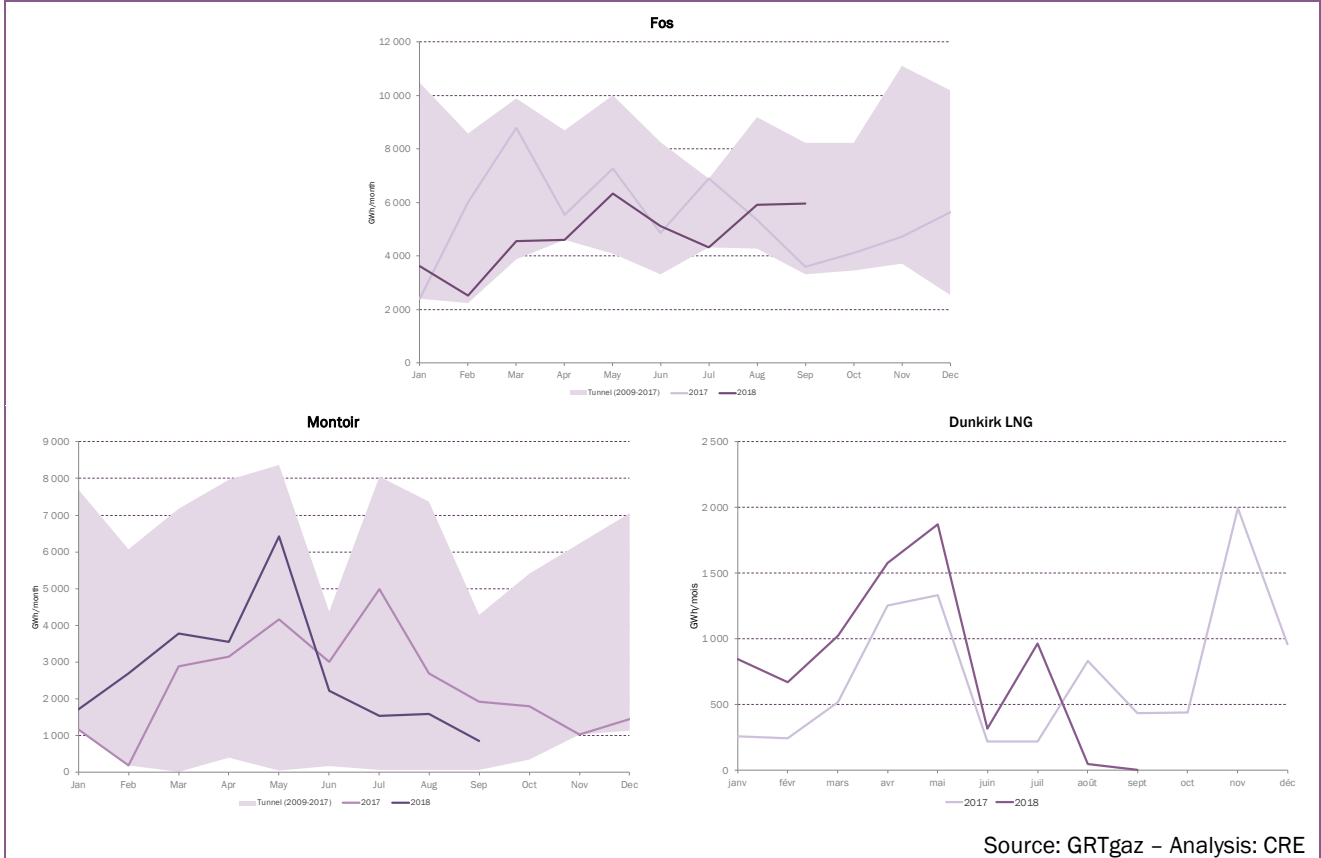
Source: Storengy, Teréga – Analysis: CRE

Figure 41: French stocks by zone



Source: GRTgaz, Teréga – Analysis: CRE

Figure 42: Send-out of the French LNG terminals



Source: GRTgaz – Analysis: CRE

Figure 43: North-South link utilization (North to south)

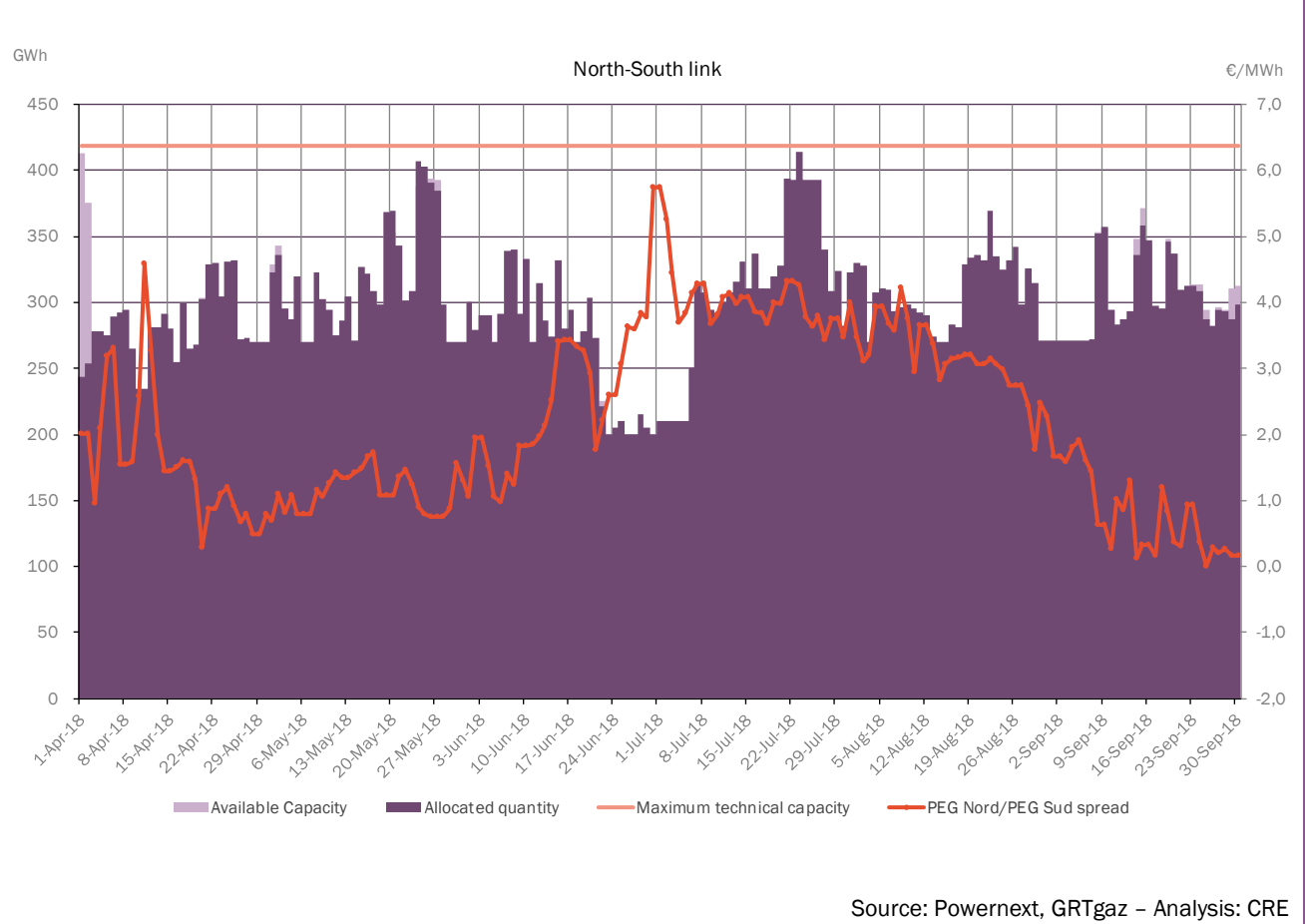
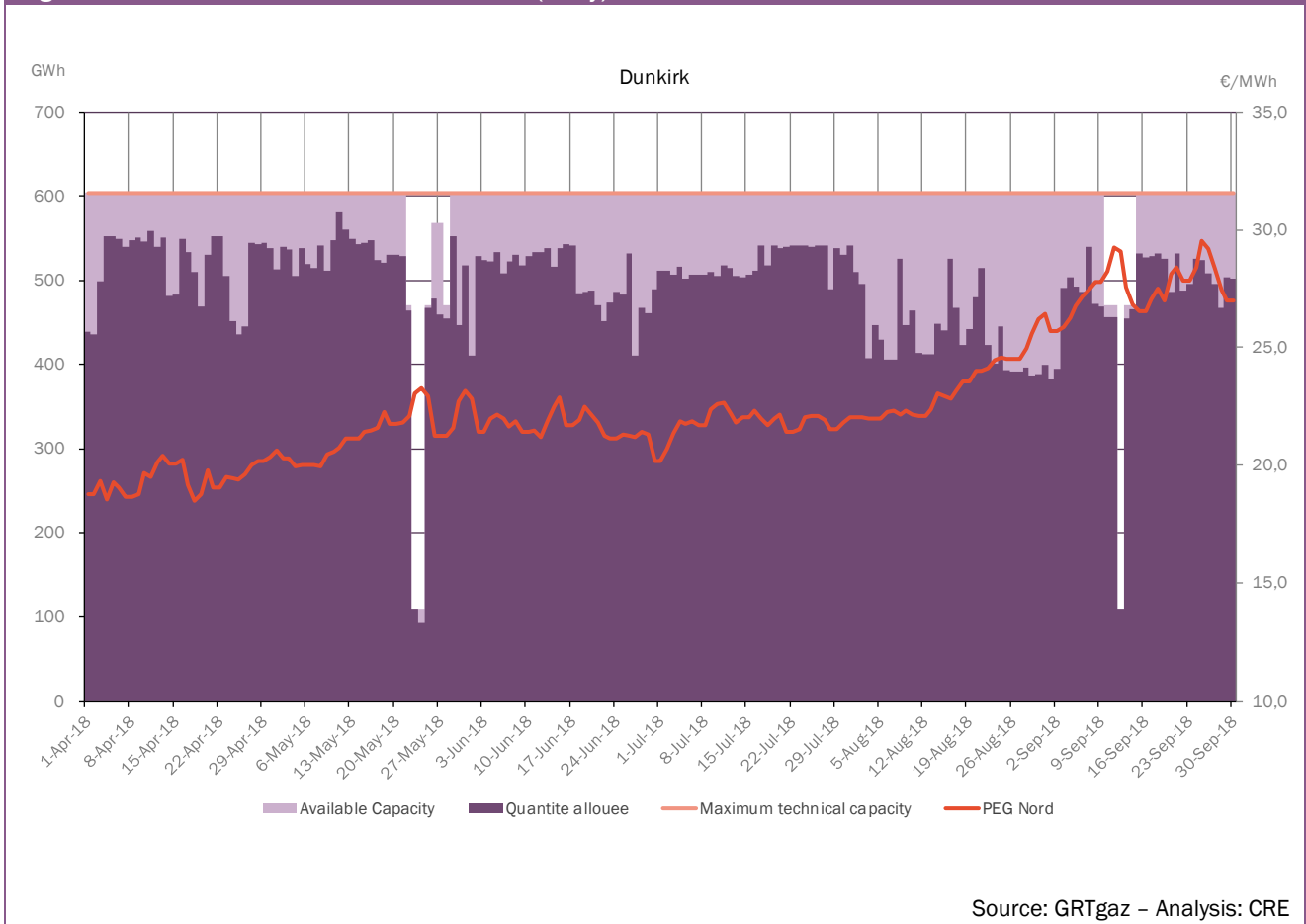


Figure 44: Dunkirk interconnection utilization (Entry)



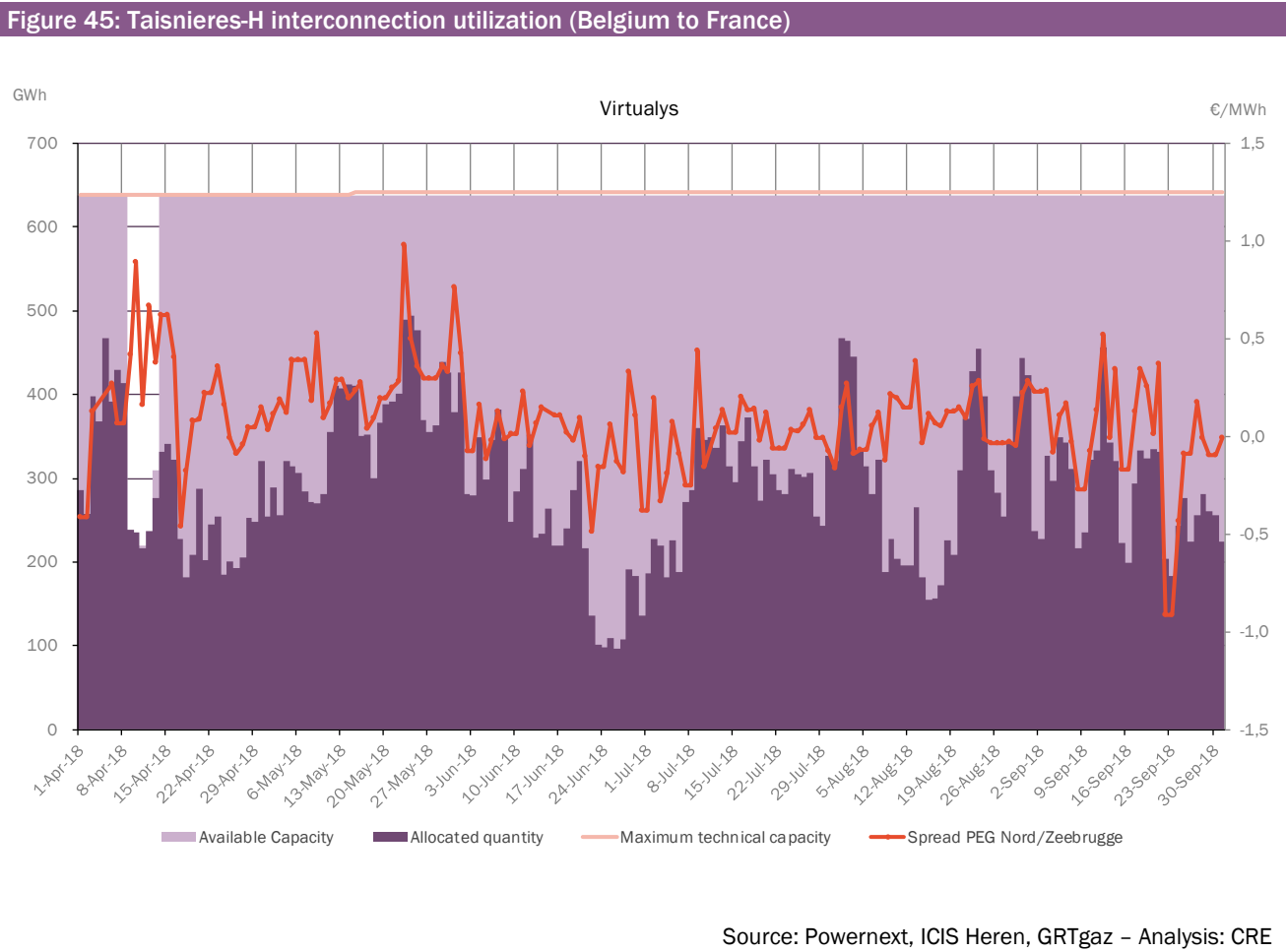
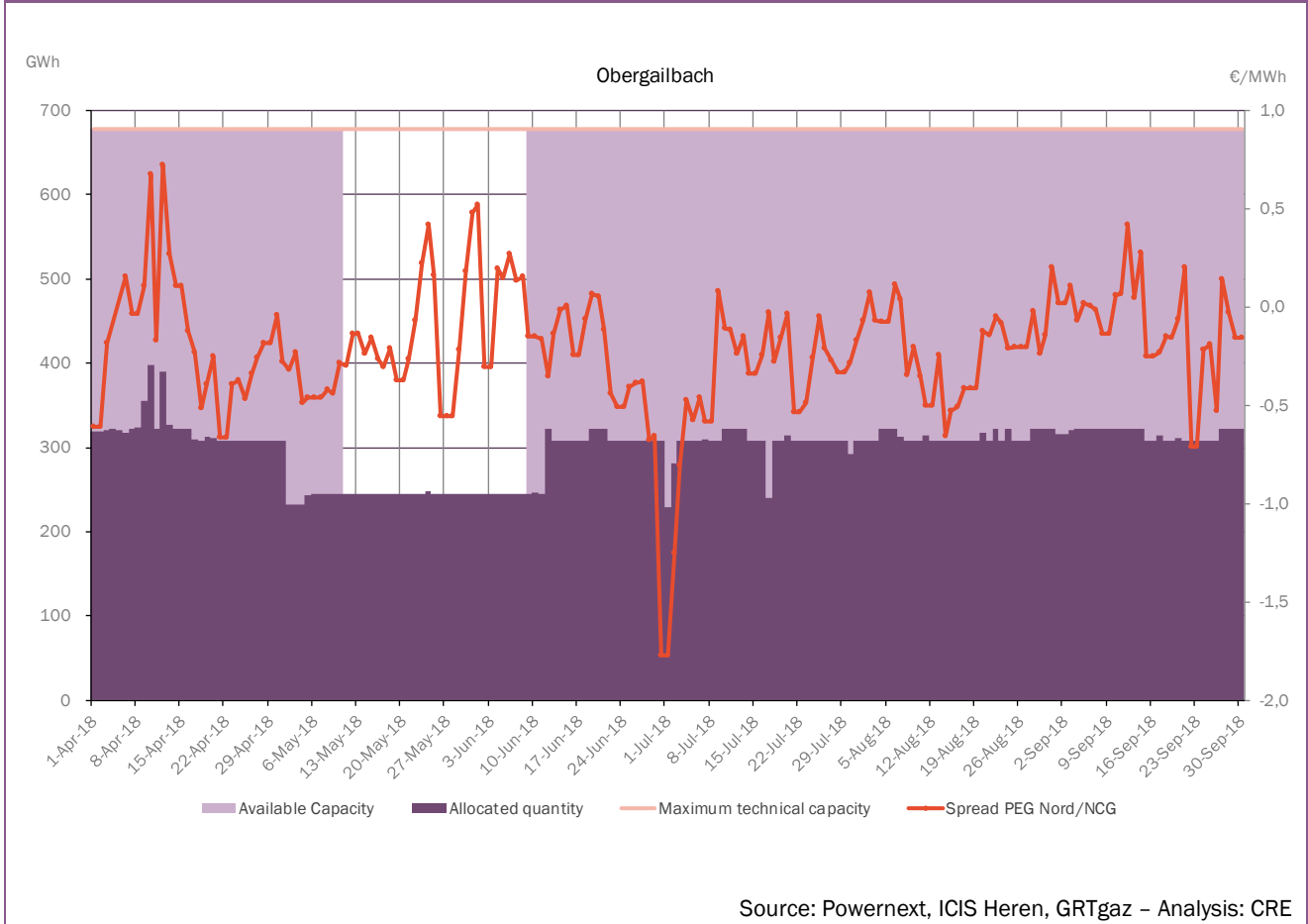


Figure 46: Obergailbach interconnection utilization (Germany to France)



Source: Powernext, ICIS Heren, GRTgaz – Analysis: CRE

Figure 47: Oltingue interconnection utilization (France to Switzerland)

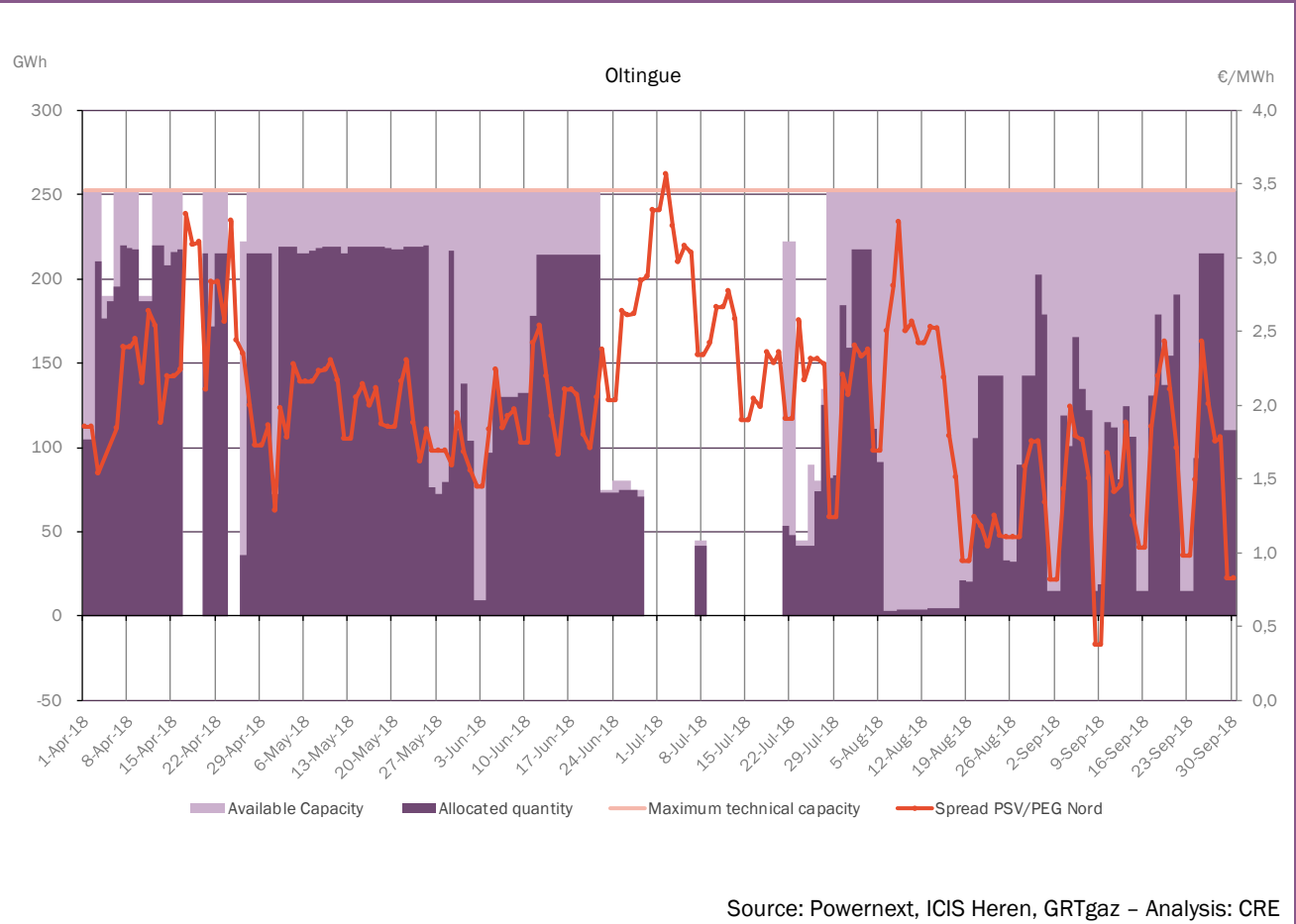


Figure 48: Montoir entry point utilization (entry)

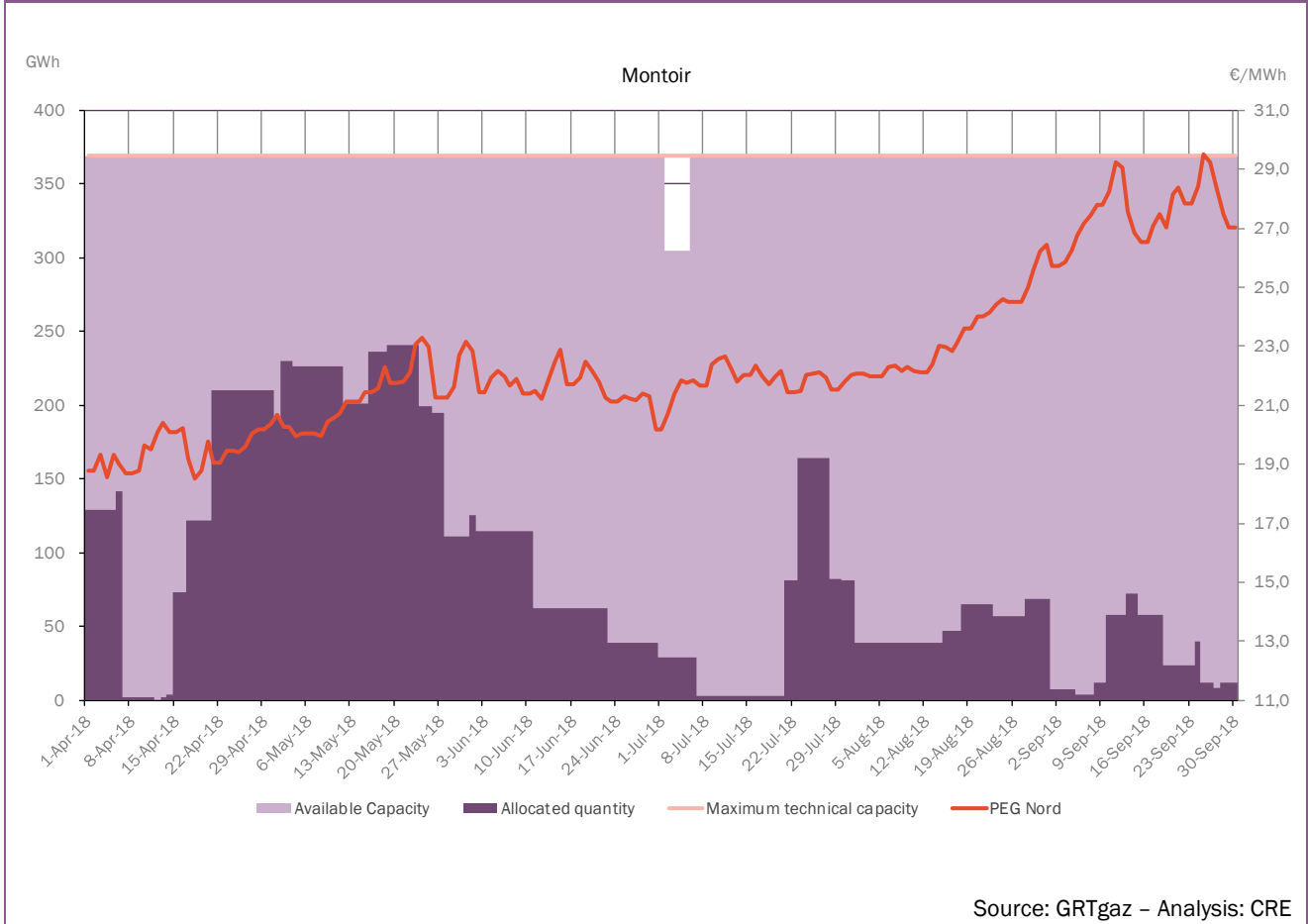


Figure 49: Fos entry point utilization (entry)

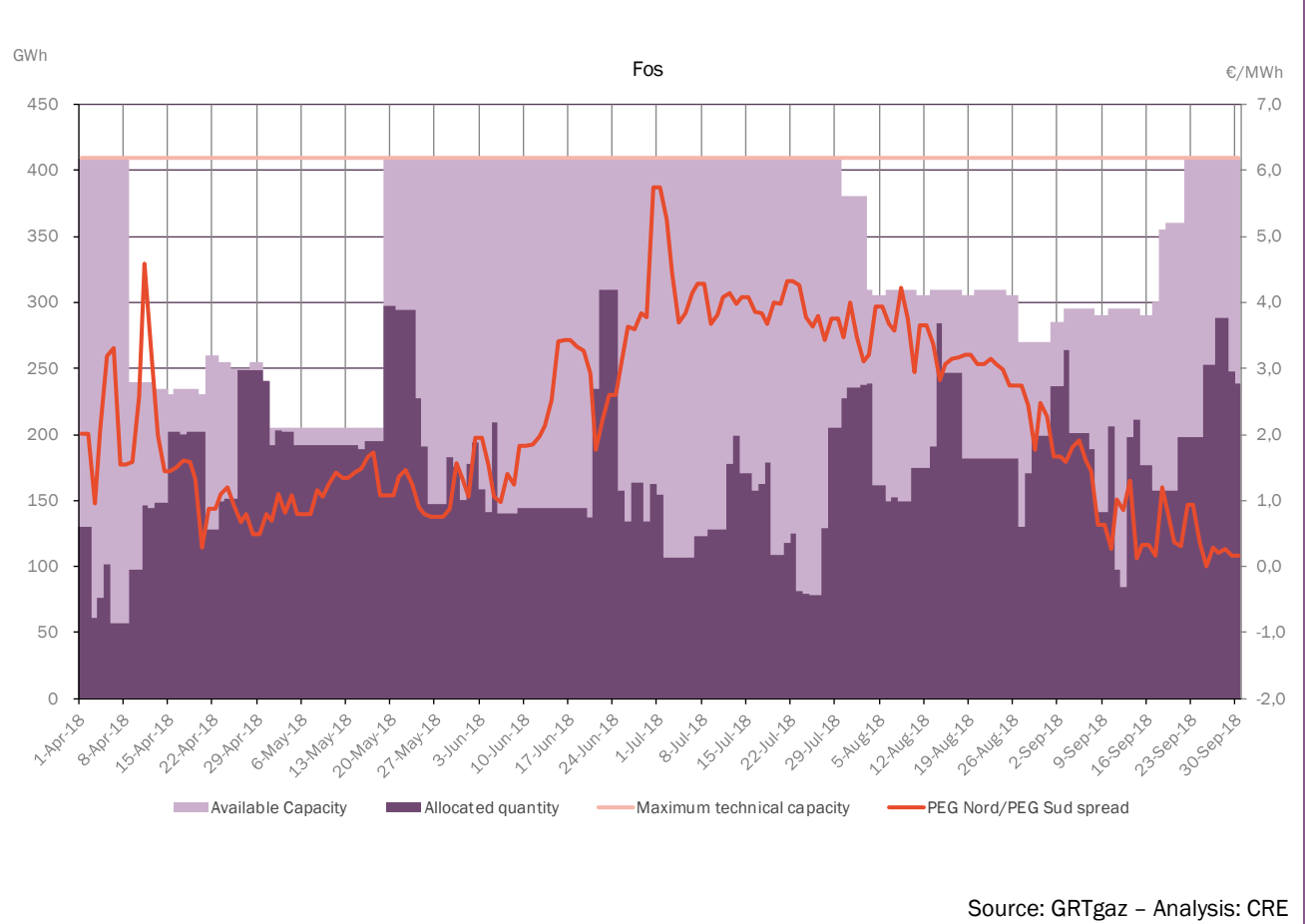


Figure 50: Exports from France to Spain vs PVB/TRS spread

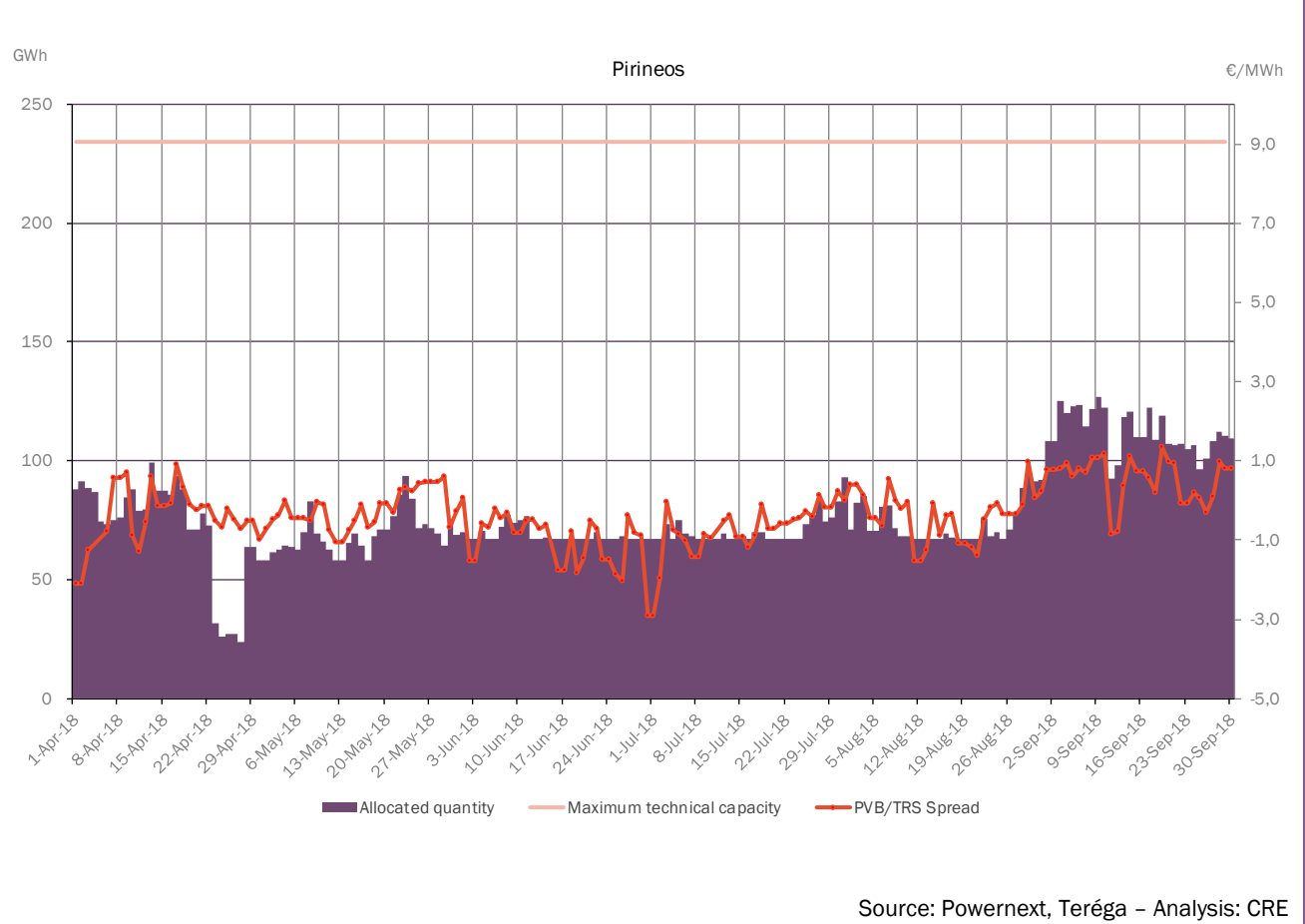
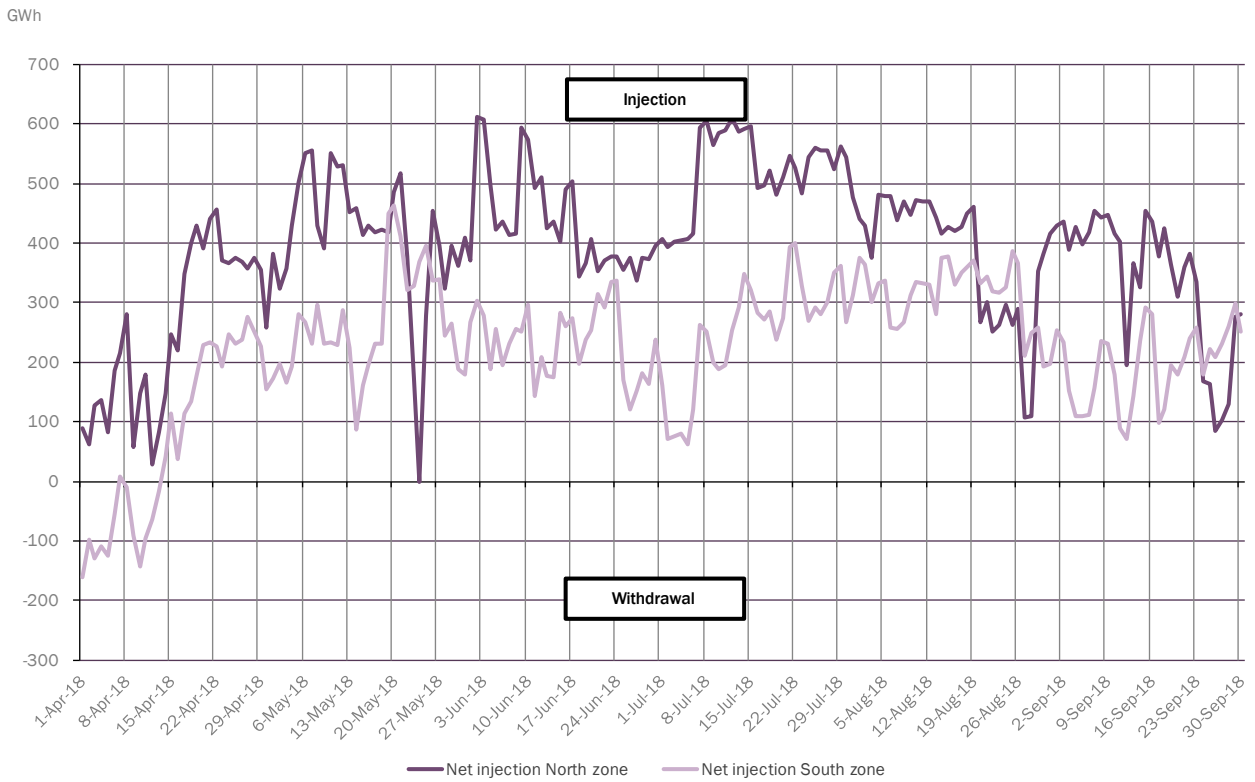
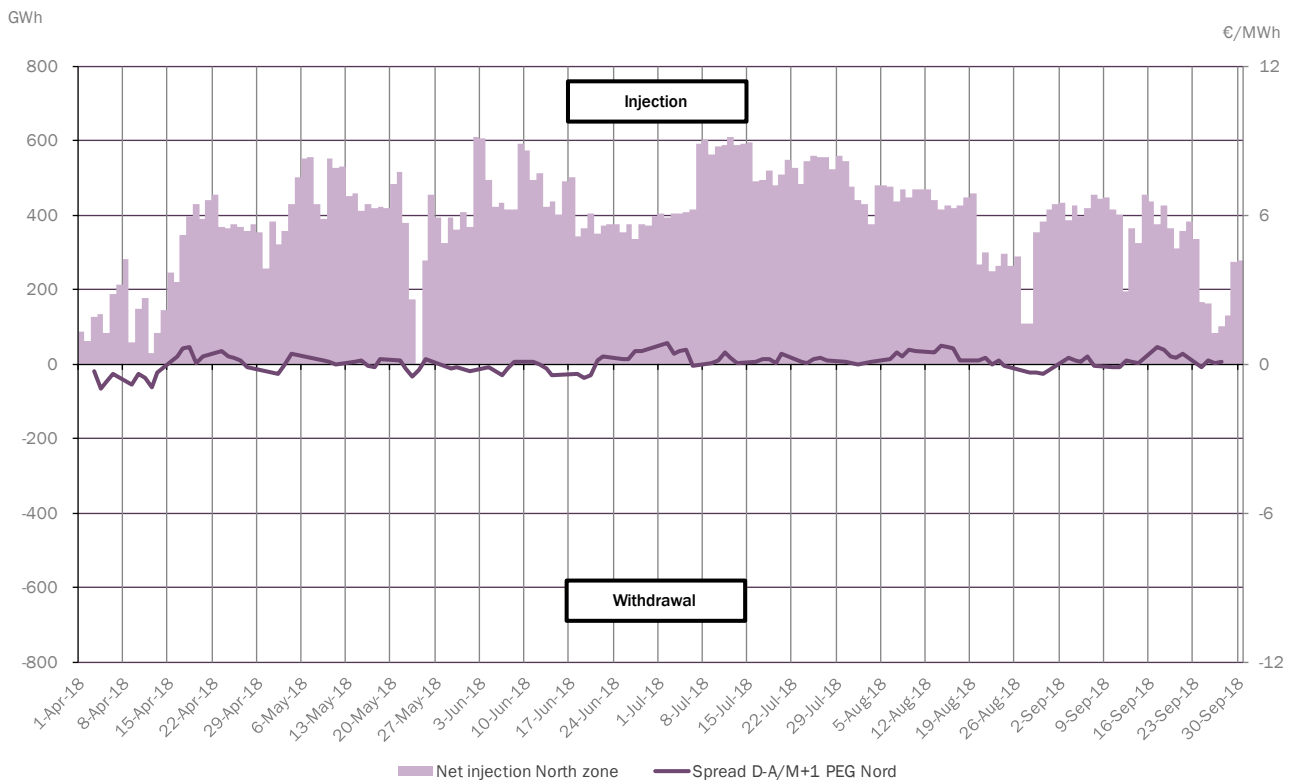


Figure 51: Storages utilization



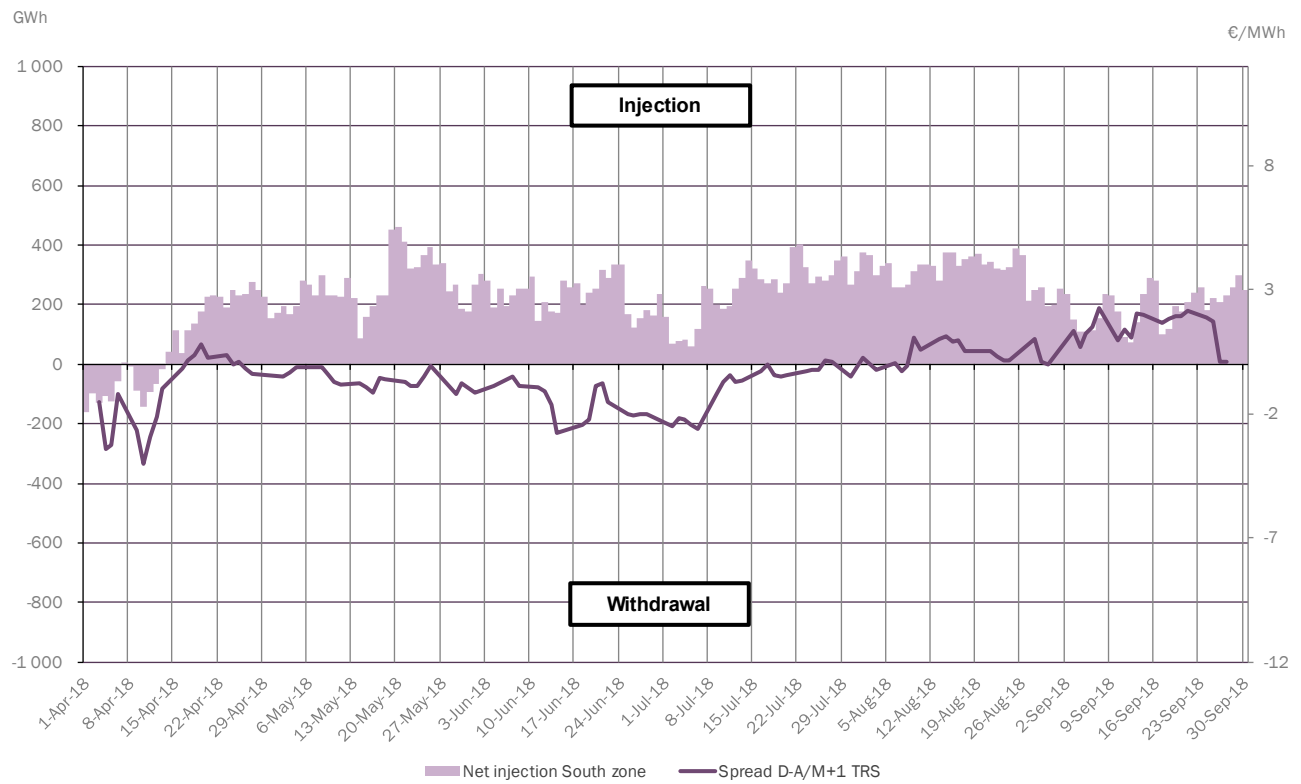
Source: GRTgaz, Teréga – Analysis: CRE

Figure 52: Net stock variation in the North zone vs temporal spreads (same trading date)



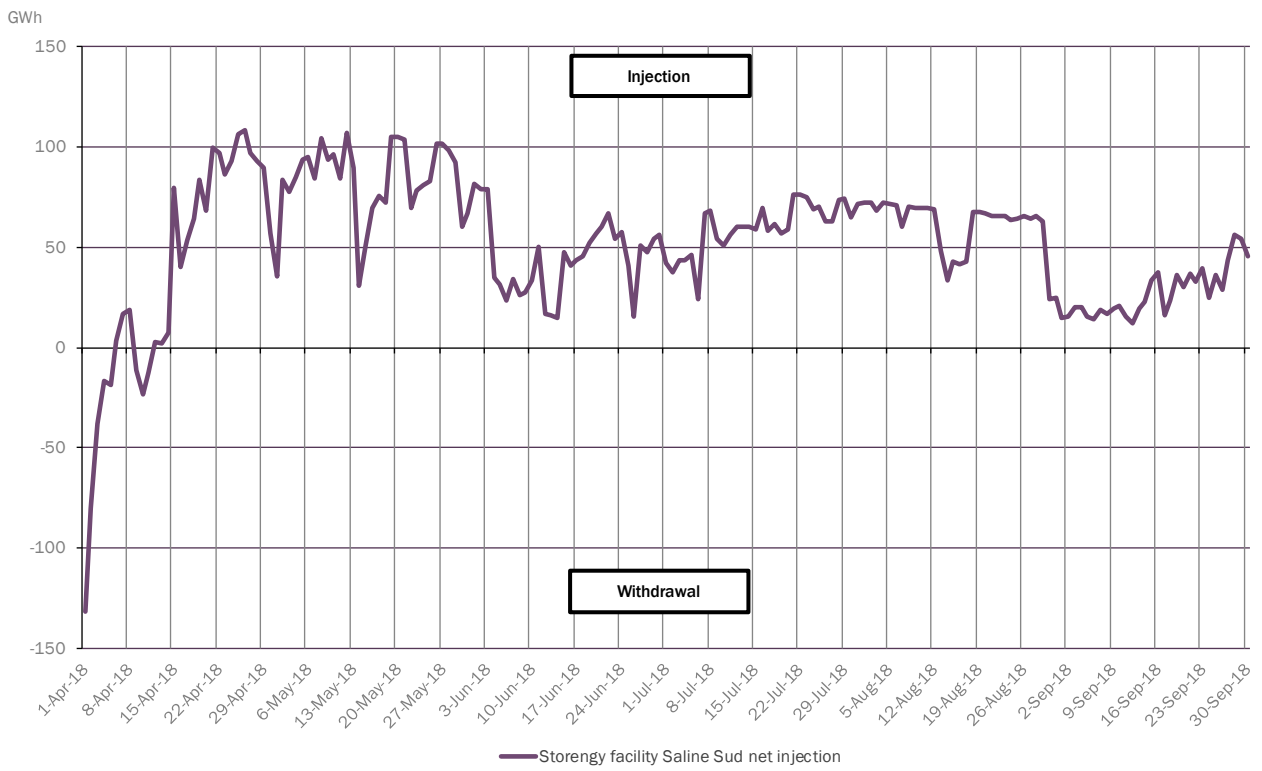
Source: Pownext, GRTgaz – Analysis: CRE

Figure 53: Net stock variation in the South zone vs temporal spreads (same trading date)



Source: Pownext, GRTgaz – Analysis: CRE

Figure 54: Net stock variation of Salins storage in the South zone

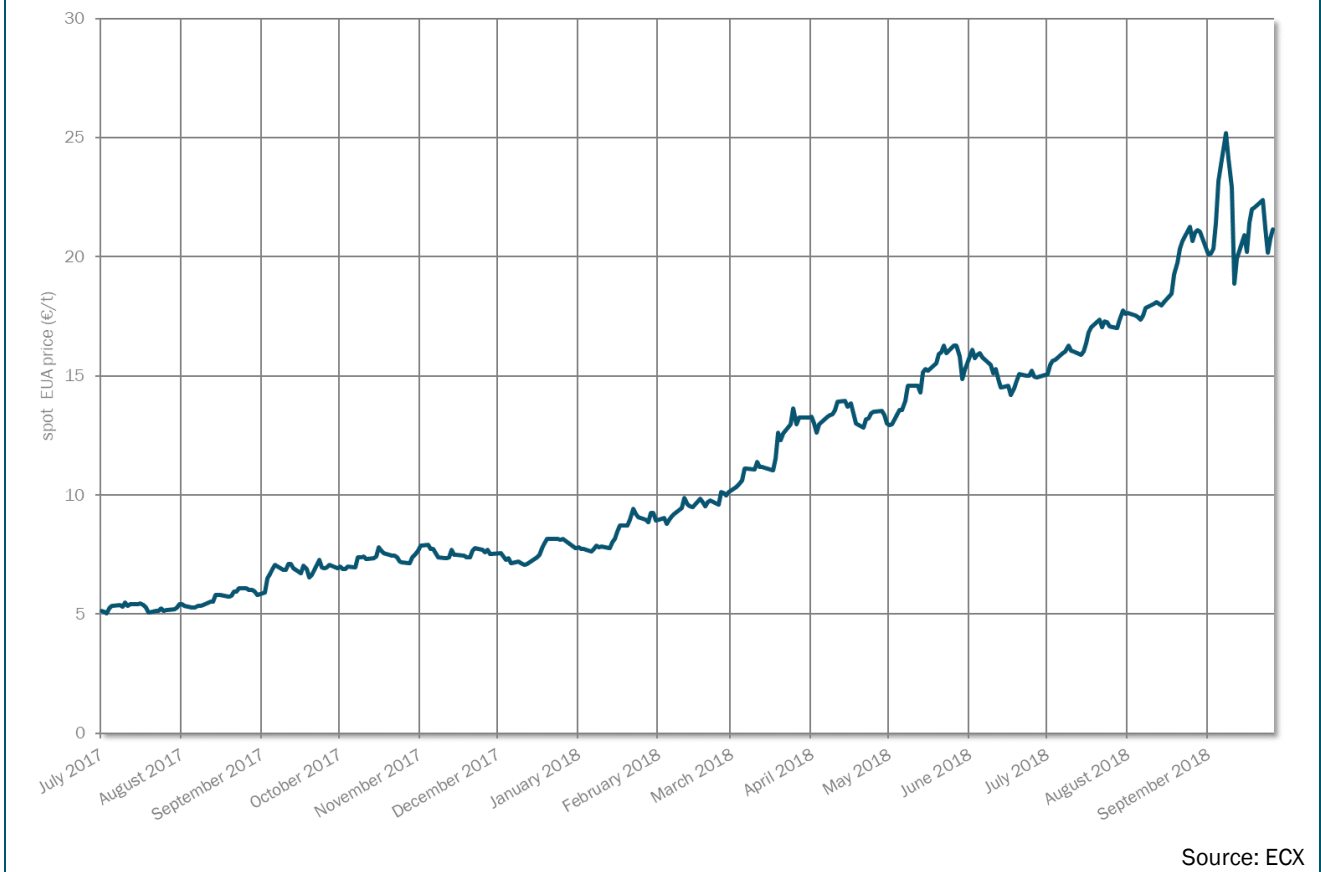


Source: GRTgaz, Teréga – Analysis: CRE

PART 3: **OTHER INDICATORS**

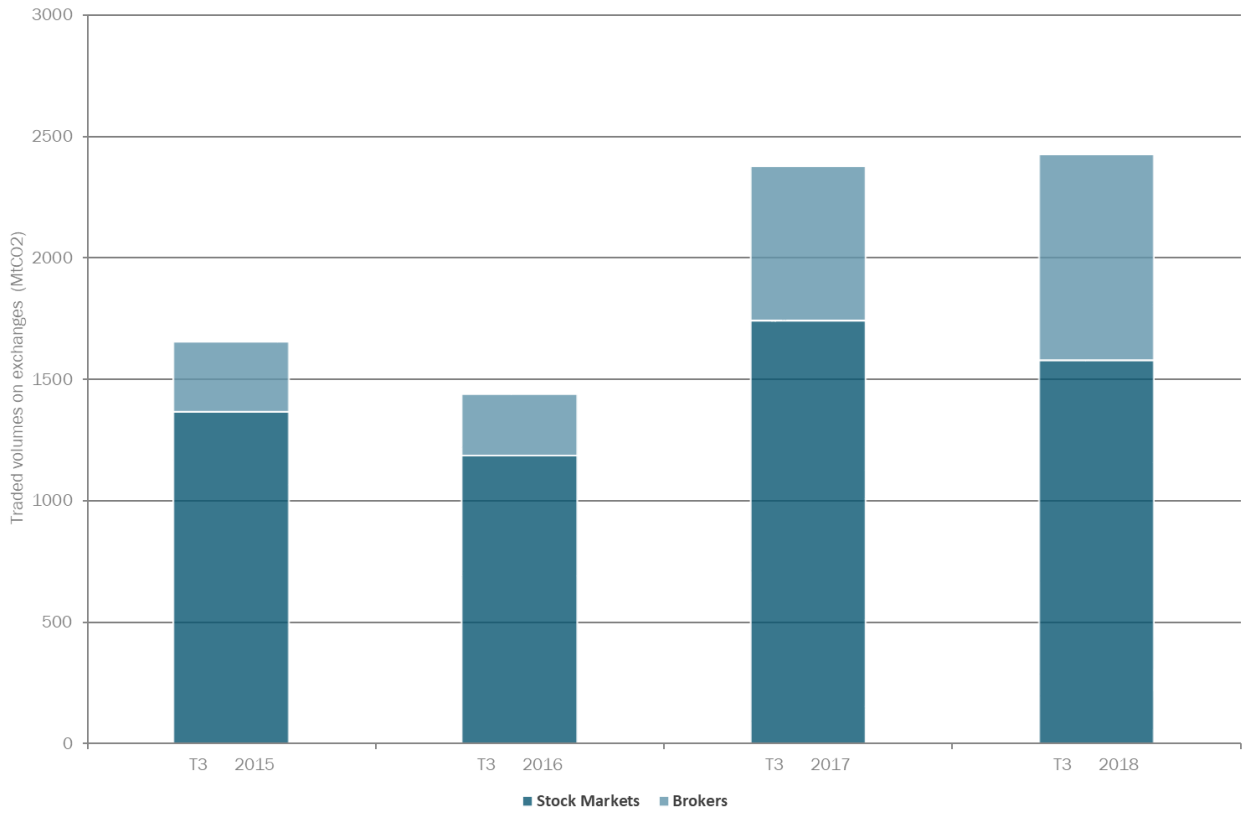
1. PRICE OF CO₂ ALLOWANCES

Figure 55: Evolution of EUA prices



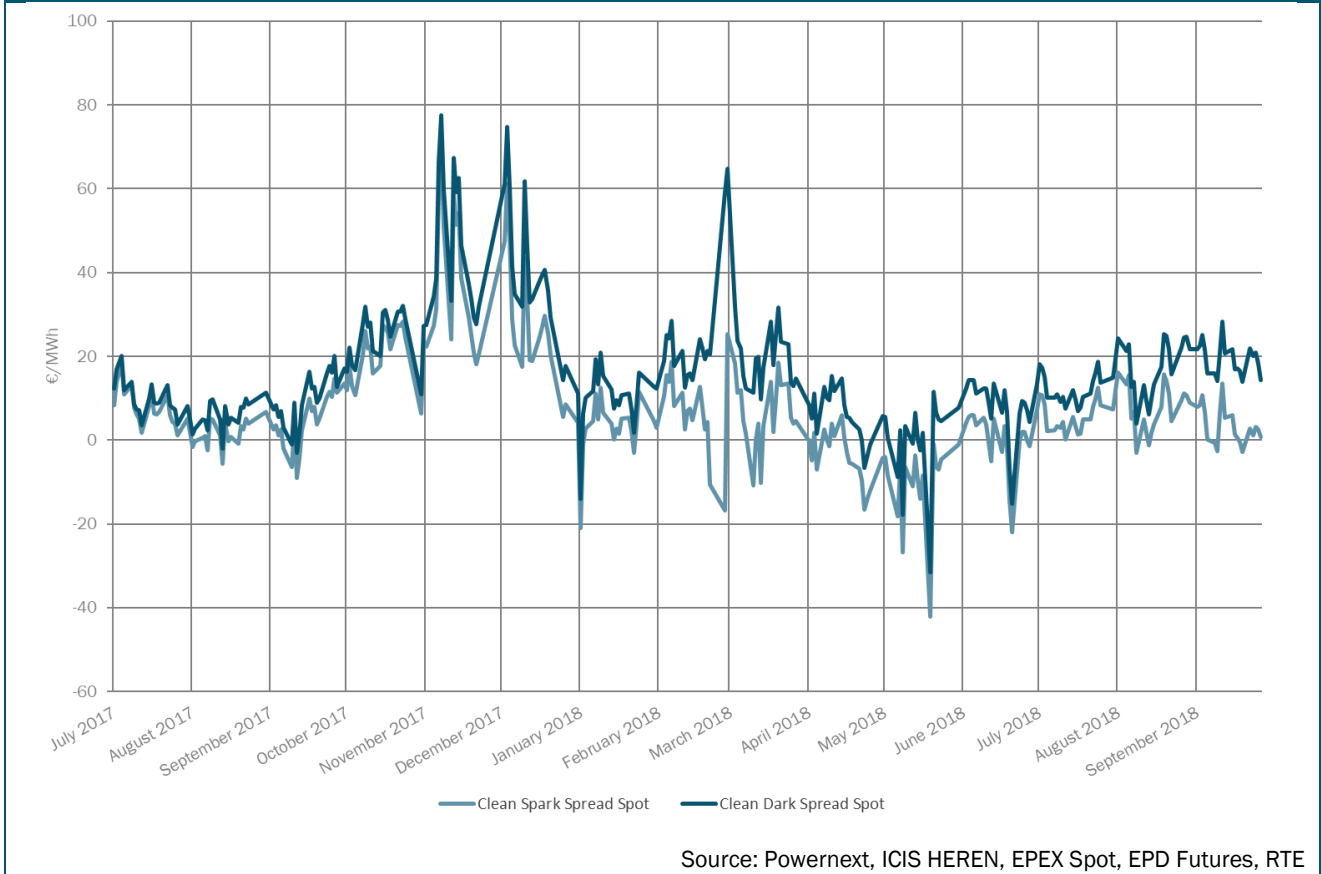
Source: ECX

Figure 56: EUA quarterly volumes traded on exchanges and via brokers



Source: EEX, ECX, LEBA

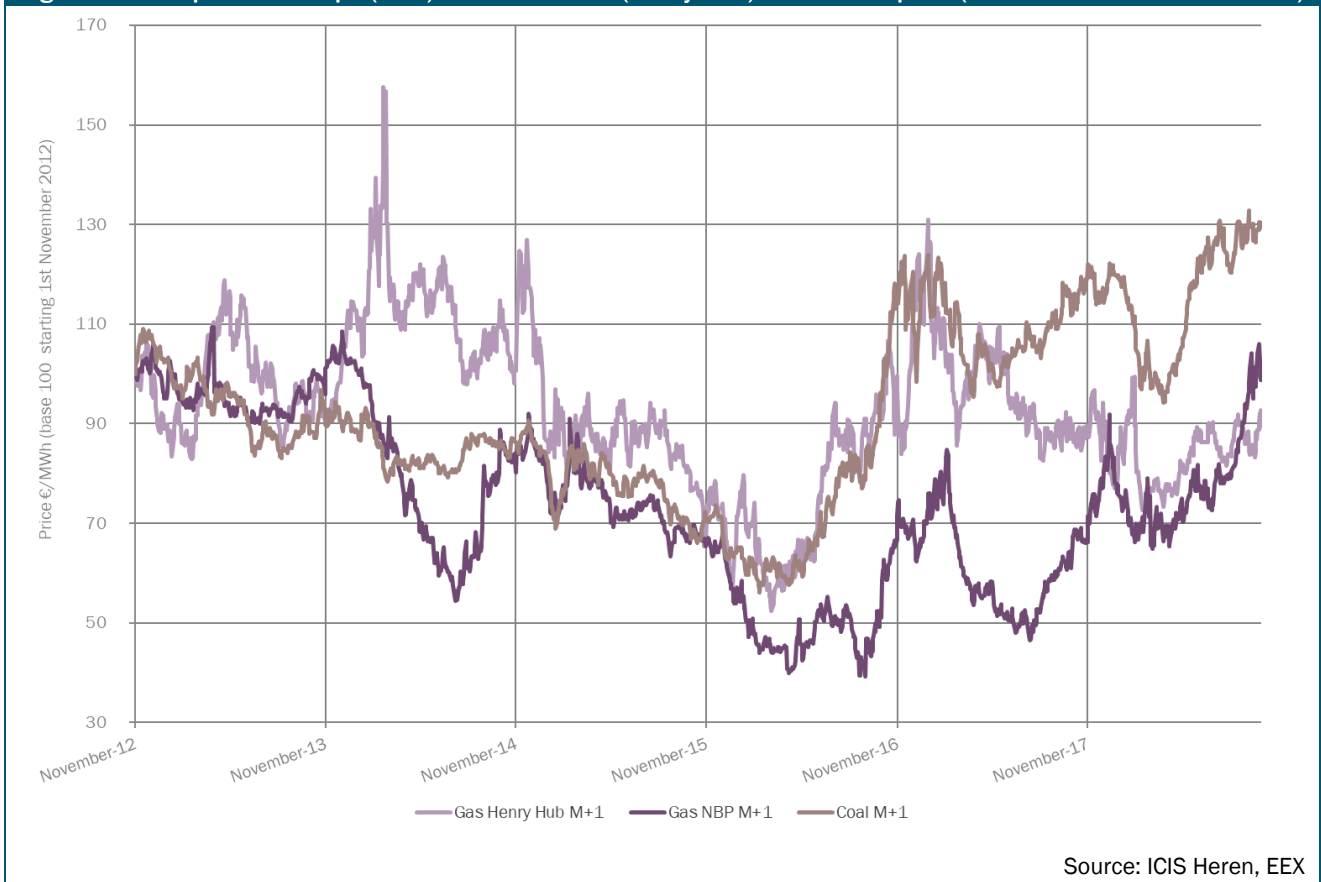
Figure 57: Evolution of the Clean Dark Spread and Clean Spark Spread on spot peakload



Clean Dark Spread (€/MWh) = $p_E - (\alpha p_C + \beta p_{CO_2})$	Clean Spark Spread (€/MWh) = $p_E - (\gamma p_G + \delta p_{CO_2})$
<ul style="list-style-type: none"> p_E spot or Y+1 peakload price in France (€/MWh) p_C M+1 or Y+1 coal price (€/MWh) p_{CO_2} spot or Y+1 CO₂ price(€/MWh) α includes the calorific power value and the coal yield* β coal emission factor** 	<ul style="list-style-type: none"> p_E spot or Y+1 peakload price in France (€/MWh) p_G M+1 or Y+1 gas price at PEG North (€/MWh) p_{CO_2} spot or Y+1 CO₂ price(€/MWh) γ gas yield*** δ gas emission factor****
<p>* Based on the assumption of a calorific power of 8.14 MWh/t for coal and a yield of 35% for coal-fired plants. It should be noted that these yields correspond to new reference installations and therefore may be quite different from the yields of existing installations and that other costs, including transportation, are not taken into account.</p> <p>** Based on an assumed emission factor of 0.96 t CO₂/MWh for coal-fired plants.</p> <p>*** Based on an assumed yield of 49% for gas plants.</p> <p>**** Based on an assumed emission factor of 0.46 t CO₂/MWh for gas plants.</p>	

2. GAS PRICE IN EUROPE AND IN AMERICA VERSUS COAL PRICE

Figure 58: Gas price in Europe (NBP) and in America (Henry Hub) versus coal price (base 100 in November 2012)



GLOSSARY

GENERAL GLOSSARY

Delivery on the wholesale market: Daily declaration of a market player to a system operator, of the gas or electricity exchanges taking place the following day with each of its counterparties. Each delivery can result from one or several transactions concluded beforehand on the wholesale market.

Forward contract: a standard contract agreement for delivery of a given quantity at a given price, for a given maturity (OTC markets).

Future contract: a standard contract agreement for delivery of a given quantity at a given price, for a given maturity (organized exchanges). Different maturities can be proposed depending on the exchange platform (week, half-year, quarter, month, year, etc.). The Y+1 contract correspond to the calendar year after the current year.

Day-ahead: a contract agreement signed for delivery the day after.

Transaction on the wholesale market: Conclusion of a contract between two wholesale market players, relative to the delivery of gas or electricity for a determined period of time, at a given price. The number of transactions in a market represents its level of activity, or its liquidity.

WHOLESALE ELECTRICITY MARKET GLOSSARY

Main electricity power exchanges in Europe:

- **EPEX Spot:** French power exchanges, non-mandatory (www.epexspot.com/fr).
- **EEX Power Derivatives:** German European Energy Exchange power exchanges, non mandatory (www.eex.de).
- **APX:** Dutch Amsterdam Power Exchange power exchanges, mandatory for imports and exports to the Netherlands (www.apx.nl).
- **Omel:** Spanish pool, almost mandatory (www.omel.es).
- **NordPool:** Scandinavian power exchanges, non-mandatory (one of the power exchanges in Europe, www.nordpool.no).

Wholesale products:

- **Intraday:** hourly contracts and intraday blocks for an undergoing day delivery.
- **Day-ahead:** contract negotiated the day before the delivery date.
- **Future:** standard contract for a given quantity, at a given price, at a given delivery date. The maturity of the contracts depends on the organized market place (week, month, quarter, season, year). The maturity Y+1 refers to the next calendar year following the on-going year.
- **Baseload:** 24 hours a day, 7 days a week.
- **Peak:** from 8 a.m. to 8 p.m. Monday to Friday.

Wholesale market segments:

- **Generation**
 - **ARENH:** stands for 'Regulated Access to Incumbent Nuclear Electricity'. It is a right that entitles suppliers to purchase electricity from EDF at a regulated price, in volumes determined by the French energy regulator.
 - **VPP:** "Virtual Power Plant" or capacity auction sales set up by EDF as a result of a decision made by the European Commission (<http://capacityauctions.edf.com/the-edf-group/capacityauctions/overview-114023.html>)

- **Wholesale purchases and sales (OTC, over the counter):** Block trading notifications, i.e, quantities selected by RTE the previous day for the day after, excluding trading via EPEX Spot.
- **Imports and exports:** http://www.rte-france.com/htm/fr/offre/offre_inter_1.htm.
- **Purchases and sales via EPEX Spot, the French electricity power exchange:** www.epexspot.com.
- **Final consumption:** sales to sites as a balancing responsible entity or under block trading.
- **Sales to network operators to compensate for their losses:** http://www.rtefrance.com/htm/fr/offre/offre_perte.htm.
- **Ventes aux gestionnaires de réseaux pour la compensation de leurs pertes :** http://www.rte-france.com/htm/fr/offre/offre_perte.htm.
- **VPP - Products auctioned off by EDF:**
 - **VPPs baseload:** these are products that reflect a generator running in base mode. It runs on the principle that bidders pay a fixed premium (in Euros/MW) each month in order to reserve available capacity, and that they regularly send EDF a schedule for using these capacities. Then they pay an operating fee per MWh taken off, which is similar to the marginal cost of EDF's nuclear generators. The price structure is therefore "fixed cost + variable cost".
 - **VPPs peak:** these are products that reflect a generator running in peak mode. The principle is the same as for the VPPs baseload, but the price paid for each MWh taken off is an estimate of the marginal cost of EDF's peak generators. Given this high variable cost, the fixed premium paid by bidders is lower than for VPPs baseload.

WHOLESALE NATURAL GAS MARKET GLOSSARY

Bcm: billion cubic meters.

Balancing zone: geographical zone of the natural gas transmission system within which entry and exit flows must be balanced by shippers.

Day-ahead: contract negotiated the day before the delivery date.

ENTSO-G: European Network of Transmission System Operators for Gas, association created by the European Commission to facilitate the cooperation between the network operators from European Member States and the creation of a European gas network.

Forward: contract with delivery at a given quantity, price and deadline.

Future: forward contract traded on an exchange (organized market).

Gas release program: in order to encourage competition in the South of France, a gas release program was set up in 2005 for a three-year period. During this program, Gaz de France released 15 TWh per year (i.e. 45 TWh for the entire program) at PEG South through calls for tenders and bilateral negotiations. Total released 1,1 TWh per year (i.e. 3,3 TWh during the program) at PEG TIGF.

Herfindahl-Hirschman Index (HHI): it is equal to the sum of the squares of the market shares of the companies and measures the market's concentration. It is higher for a concentrated market. It is normally assumed that a market is not concentrated when the HHI is lower than 1,000 and very concentrated if it is above 1,800.

Market coupling: mechanism that enables to bring together supply and demand of the coupled markets and to simultaneously and implicitly allocate the interconnection capacities between the balancing zones (North and South). Market coupling between North and South GRTgaz zones respects the specificities of the gas market: day-ahead prices are set continuously (each transaction is dealt at a particular price) and not by a fixing as it is for the electricity market (a unique auction operated by the exchange to set the price for each hour of the day).

Liquefied Natural Gas (LNG): LNG is natural gas condensed into liquid (by reducing its temperature to about -160 °C at atmospheric pressure), which has a volume decreased to about 1/600. It is mainly transported by sea in LNG tankers and unloaded in regasification terminals before being reinjected into the transport network.

National Balancing Point (NBP): gas hub of the United Kingdom. Because of the large volumes exchanged on this hub, prices on that exchange are an important reference for gas wholesale exchanges in Europe.

Nomination: quantity of energy, expressed in kWh (PCS 25 °C) notified by the shipper to the TSO any day that the shipper asks the TSO to take off, transmit or deliver gas in the transport network. By extension, “to nominate” refers to the notification to the TSO of a nomination.

North H / North B balancing zones: the North B balancing zone is supplied by B-gas, which comes essentially from the Netherlands and is characterized by a higher level of nitrogen (B and H meaning low and high calorific value, respectively). Since 1st April 2013, the North-H and North-B balancing zones merged creating a unique balancing zone.

PEG, Point d'échange de gaz: Virtual point attached to each balancing zone in France in which players in the wholesale market can exchange physical quantities of gas.

Spot market: the spot market include Intraday, Day-ahead, Weekend, Week products and those with a maturity below one month.

Take-or-Pay: clause of a long-term gas contract under which the seller (generally the producer) guarantees to supply a defined volume of gas to its client (generally an end consumer supplier) in exchange of its engagement to pay a minimal volume, whether or not the client decided to take this volume.

Unconventional gas: shale gases include three types of natural gas: shale gas, coal bed methane and tight gas. Unlike conventional gases, unconventional gases are found in low permeability rocks difficult to access. Their extraction is done thanks to two techniques: horizontal drilling and hydraulic fracturing.

WHOLESALE CARBON MARKET GLOSSARY

Backloading: Short-term solution to limit the surplus of CO2 allowances available on the market. It consists in removing 400 million of allowances in 2014, 300 million in 2015 and 200 million in 2016. Instead of selling it back in 2019 or 2020, these allowances will finally be put in the Market Stability Reserve in 2019

Banking: possibility for registrants to use an allowance issued at the beginning of a previous compliance period for compliance purposes.

Borrowing: the borrowing of an allowance for compliance purposes, giving registrants the option to use an allowance granted at the beginning of the followings compliance period (allowances for Year N are entered on the registers before 28 February, while on 30 April in Year N, allowances must be returned in respect of emissions for Year N-1).

Carbon dioxide (CO2): main greenhouse gas, produced primarily from the combustion of fossil energies.

CITL: Community Independent Transaction Log, a central transaction log run by the European Commission, which records the information provided by national registers.

CDM: Clean Development Mechanism. This is one of the flexibility mechanisms under the Kyoto Protocol, which enables developed countries to finance emissions reduction or greenhouse gas sequestration projects in developing countries and to claim Certified Emissions Reduction units (CERs), which they can accrue to fulfil their own emissions reduction obligations. CDM projects aim to encourage the transfer of environmentally-friendly technologies and to promote sustainable development in developing countries.

CER: Certified Emissions Reduction units from projects deployed under the Clean Development Mechanism (CDM) of the Kyoto Protocol. Some countries and companies make use of credits from CDM projects and joint application projects to comply with their Kyoto objectives. These units can be used in a limited way for the EU ETS compliance purpose until the end of the third phase, meaning 2020.

ECX: European Climate Exchange, carbon exchange based in London (www.theice.com)

Emission allowance (or emissions permit): unit of account under the EU Emission Trading Scheme. The allowance is a quantity of GHG emissions (expressed in tonnes of CO2 equivalent) that cannot be exceeded over a given period, which is granted to a country or an economic agent by an administrative authority (intergovernmental organization or government agency).

Energy - climate package: a set of EU laws adopted late 2008, relating to energy and climate change.

ERU: Emission Reduction Unit, carbon credits generated by Joint Implementation (JI) projects, in accordance with the rules defined by the Kyoto Protocol. Companies falling within the scope of the European Union Emission Trading Scheme (EUETS) can use these credits to meet their greenhouse gas emission reduction obligations. These units can be used in a limited way for the EU ETS compliance purpose until the end of the third phase, meaning 2020.

EUA: European Union Allowance, European emission allowance that authorizes the holder to emit the equivalent of one tonne of carbon dioxide in greenhouse gases.

EU ETS: the European Union Emission Trading Scheme is an EU mechanism that aims to reduce the global emission of CO₂ and achieve the European Union's objectives under the Kyoto Protocol. It is the largest greenhouse gas emission trading scheme in the world.

GHG: greenhouse gas. Gas contributing to the greenhouse effect (see Greenhouse effect). Not all GHGs make the same contribution to the greenhouse effect. In order to compare the different greenhouse gas emissions, their effects are expressed in terms of tonnes of carbon dioxide.

Greenhouse effect: effect causing a natural process, which maintains the lower atmosphere at an average temperature of 15°C. It is linked to the presence of certain gases in the atmosphere, such as carbon dioxide and methane, which trap the radiation emitted by the Earth and reflect some of it in the direction of the sun. As the quantity of greenhouse gases produced by humans is too high, temperatures are increasing significantly.

Kyoto Protocol: international treaty aiming to reduce greenhouse gas emissions. The Protocol sets out detailed commitments for the industrialized countries concerned, for reducing or limiting greenhouse gas (GHG) emissions during the first, so-called commitment period, i.e. 2008-2012 (-5.2% in relation to 1990). To achieve this, these countries are obliged to define policies and national measures to fight climate change.

Market Stability Reserve: Long-term solution to limit the surplus of CO₂ allowances available on the market. This mechanism will start in 2019 and will absorb 12 % of the market surplus when it is above 833 MtCO₂ and release 100 MtCO₂ when it is below 400 MtCO₂. From 2019 to 2023, the absorption rate will be doubled. Finally, the volume of the reserved is capped by the amount of allowances that were auctioned the previous year: if the reserve volume is above this amount, the surplus of allowances will be cancelled.

Phase IV: the fourth phase of the EU ETS for the period 2021-2030, whom reform, adopted in November 2017 by the European Commission, aims to better address the risk of carbon leakage, and limit the surplus on the carbon market.

Set aside: option of setting aside a share of the allowances for Phase III proposed by the European institutions, in order to curb the surplus of allowances of EU ETS.

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