COMMISSION
DE RÉGULATION
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SURVEILLANCE

REPORT 2015-2016

Functionning of the wholesale electricity, CO_2 and natural gas markets

CONTENTS

SUMMARY

Effective operational implementation of the REMIT regulation

Following the adoption of the Commission implementing regulation on data reporting in the wholesale electricity and gas markets, the implementation of Regulation (EU) No 1227/2011 of the European Parliament and of the Council on wholesale energy market integrity and transparency (REMIT) has fully entered a concrete phase both at European and national levels.

At European level, the Agency for the Cooperation of Energy Regulators (ACER) started the collection of transaction data for standard contracts in October 2015. The collection of data for non-standard contracts started in April 2016. For all European markets, the collection of these data is centralised when possible, with data reporting entities. Power exchanges, including EPEX, EEX and Powernext, as well as brokers are some of such entities.

At national level, CRE is one of the first regulators to have its IT security systems certified by ACER, which is a pre-condition for the sharing of data by ACER with national regulators. This certification validated the robustness of CRE's information security policy within the framework of its wholesale market surveillance activities. In addition, the national legal framework was supplemented by order No 2016-461 of 14 April 2016 which in particular amended Articles L. 131-2 and L. 134-25 of the Energy Code to specify CRE's competence as regards the collection of information, registration as well as obligations of persons professionally arranging transactions and the possibility for CRE's standing committee for disputes and sanctions (CoRDiS) to sanction any breaches. The powers to sanction breaches of Articles 3, 4 and 5 of REMIT moreover apply to the capacity market.

Several months ago, CRE began to receive flows of data relayed by ACER within the framework of European data collection. This is done on a daily basis for standard contract data. CRE participates actively in analysis led by ACER to test the quality and completeness of data that are collected. In that regard, CRE temporarily extended the national data collection system in order to carry out these tests.

At the institutional level, CRE contributes actively to European implementation of the REMIT regulation. It takes part in the working groups of CEER and ACER on the subject. It also contributes, in coordination with ACER and on a bilateral basis with regulators of several countries bordering France, to sharing methodology and good practices as concerns the surveillance of wholesale energy markets.

Law No. 2013-312 of 15 April 2013 amended the French Energy Code entrusting CRE with guaranteeing compliance with obligations and prohibitions set out in REMIT and giving CoRDiS the possibility of sanctioning any breaches. To date, three investigations have been opened by CRE, one for electricity and two for gas. The investigation concerning the electricity market was not referred to CoRDiS since it dealt with transactions occurring prior to the adoption of Law No. 2013-312 of 15 April 2013 which empowered CoRDiS to sanction any breaches of the REMIT regulation.

Continued drop in raw material prices throughout 2015, followed by a rebound since early 2016

No major tightness was observed in 2015 in the French wholesale electricity and gas markets, against a drop in raw material prices, with another year warmer than usual and a particularly mild winter 2015-2016.

The drop in oil prices, which was fast in 2014, continued in 2015, down an average 36 % between the two years. Coal prices dropped (-16 % in 2015). However, raw material prices rebounded in the first months of 2016. Therefore, between the first and second quarter of 2016, oil prices increased 26 % reaching €31/barrel. Similarly, the price of coal increased from €32.4/t in January to €50.1/t at the end of June (+55 %). Developments in supply (OPEP decisions), and especially in demand, related to growth prospects (particularly in Asia) are responsible in part for these changes. These trends are reflected in the wholesale energy price developments.

The price of CO_2 allowances was disconnected from the raw material trends, first with an increase in 2015 exceeding €8/tonne, followed by a sharp decline early 2016 (below €5). This fall is due in particular to sales carried out by electricity producers in Europe against a backdrop of excess allowances.

In this context, the French government proposed a national minimum price for the tonne of CO_2 (envisaged at €30/tonne) for thermal power stations. On 11 July 2016, the government announced that this mechanism would be applied only to coal plants.

CRE recommends that the effects of such a mechanism should be studied specifically given the potential effects on the functioning of markets. The following in particular should be analysed:

- the effects on wholesale electricity prices in France and on border exchanges;
- the resulting carbon footprint since the expected rise in French wholesale electricity prices could lead to high-carbon electricity imports from bordering countries according to the periods of the year;
- the micro-economic effects for the plants concerned and the macro-economic effects in terms of supply security;
- and lastly, how it will link with the European framework, in particular the European Union Emissions Trading System or, with other similar national measures.

Wholesale electricity markets: forward electricity prices, after bottoming out in 2015, increased sharply in the first quarter of 2016 against growing liquidity

No notable tightness in the supply/demand balance was seen in 2015. Consumption picked up compared to the low levels in 2014 and subscriptions to the ARENH mechanism (regulated access to incumbent nuclear electricity) dropped drastically. The renewable energy portfolio continues to grow. Renewable energy now accounts for almost 14 % of installed capacity (33 % when including hydraulic capacity). The relative level of electricity prices and raw material prices enabled an average 24 % use of installed gas capacity (compared to 9 % in 2014). Therefore, as to be expected, gas was marginal in the power plant merit order more often in 2015 (16 % of the time) than in 2014 (9 % of the time).

Under these conditions, spot prices remained at a relatively low level at an average €38.5/MWh in 2015, even though they were up compared to the previous year (+11 %). This pickup could be linked to the upturn in electricity consumption compared to the very low levels of 2014. This was seen in particular in the second quarter of 2015 with hydraulic power production down drastically compared to the same period in 2014.

Forward prices on the other hand dropped continuously throughout 2015. Calendar prices dropped from €39.9/MWh to €33.5/MWh between the start and the end of the year. They remained higher than German prices (an average difference of €7.2 in 2015), a difference which narrowed in the first half of 2016 (average difference of €5.1/MWh).

However, after bottoming out during the first quarter of 2016 (€25/MWh for calendar 1, 2 and 3 year products), forward prices quickly picked up and stood at almost €35/MWh at the end of June. This upturn followed a similar movement followed by raw material prices and in particular coal and also reflected price increase expectations in the event of the implementation of a national floor price system for CO_2.

Wholesale electricity prices increased sharply over the last two weeks in September and the 2017 calendar product went from €32/MWh at the start of September to €40/MWh at the start of October. This increase occurred against low effective availability of nuclear generation and information that nuclear unit outages would be extended.

Current uncertainty concerning the availability of nuclear generation is responsible for the pickup in wholesale prices. This increase, given its magnitude and quick pace, is likely to have a major impact on energy markets. In this context, CRE will be particularly attentive to the conditions of this price increase and in particular to compliance with the transparency obligations of the REMIT regulation.

Current calendar prices for 2017 delivery are at levels that could renew interest in ARENH product subscriptions.

With regard to market liquidity, the low electricity prices in 2015 favoured the continued growth in volumes traded in the wholesale markets. This improvement is seen in the spot market and in all long-term market timeframes. Volumes traded increased by almost 50 % in 2015 compared to 2014, reaching 1,466 TWh, i.e. a transaction volume of €52 billion.

Wholesale gas markets: prices that remain low and convergence of world prices, with the exception of the USA

In 2015, the fundamentals of the French wholesale gas market were marked by comfortable supply and the absence of tightness in infrastructure use. Gas prices at the PEG Nord were linked closely to the prices of adjacent markets. In the south zone, the price difference with the PEG Nord was very narrow against the absence of tightness at the Nord-Sud (north-south) link and good LNG supply.

The abundance of supply to meet existing gas demand enabled the convergence of gas prices in Europe, Asia and South America. Only US prices remained disconnected, at levels lower than those of the other world prices.

In this context, gas prices dropped all throughout 2015, reaching at its lowest €12/MWh (April 2016). These prices then recovered slightly, but to a lesser extent than for other raw materials. Similar developments were observed in forward prices.

Lastly, volumes traded in the wholesale gas markets increased compared to 2014. In total, these volumes increased 15 % in 2015 compared to 2014. They represent 605 TWh for a transaction volume of over €12 billion.

KEY FIGURES

1. ELECTRICITY MARKET

Table 1: Installed generation capacity in France

				Annual variation 2014/2015	
	End 2013	End 2014	End 2015	As a percentage	As a value
Generating facilities (GW)	**128.1**	**128.9**	**129.3**	**0 %**	**0.4**
Nuclear	**63.1**	**63.1**	**63.1**	**0 %**	**0.0**
Hydraulic	**25.4**	**25.4**	**25.4**	**0 %**	**0.0**
Fossil-fired	**25.6**	**24.4**	**22.6**	**-8 %**	**-1.9**
Coal	6.3	5.1	3.0	-41 %	-2.1
Fuel oil	8.8	8.9	8.6	-3 %	-0.2
Gas	10.5	10.4	10.9	4.7 %	0.5
Renewable (excluding hydraulic)	**14.0**	**16.0**	**18.2**	**14 %**	**2.2**
Wind	8.1	9.1	10.3	13 %	1.2
Photovoltaic	4.3	5.3	6.2	17 %	0.9
Renewable thermal	1.5	1.6	1.7	8 %	0.1

Source: RTE

Table 2: Production of different technology sectors in France

				Annual variation 2014/2015				Variation HY1 2015/HY1 2016	
	2013	2014	2015	As a percentage	As a value	HY1 2015	HY1 2016	As a percentage	As a value
Production (TWh)	**550.9**	**540.6**	**545.1**	**1 %**	**4.5**	**282.3**	**275.8**	**-2 %**	**-6.5**
Nuclear	**403.7**	**415.9**	**416.8**	**0 %**	**0.9**	**210.4**	**204.5**	**-3 %**	**-5.9**
Hydraulic	**75.7**	**68.2**	**58.7**	**-14 %**	**-9.5**	**36.3**	**34.9**	**-4 %**	**-1.4**
Fossil-fired	**44.7**	**27.0**	**33.2**	**23 %**	**6.2**	**18.1**	**18.3**	**1 %**	**0.2**
Coal	19.8	8.3	8.5	2 %	0.2	5.0	2.7	-47 %	-2.3
Gas	19.5	14.3	21.9	53 %	7.6	11.3	14.5	28 %	3.2
Fuel oil	5.4	4.4	2.8	-36 %	-1.6	1.8	1.1	-38 %	-0.7
Renewable (excluding hydraulic)	**26.8**	**29.5**	**36.4**	**23 %**	**6.9**	**17.5**	**18.2**	**4 %**	0.7
Wind	15.9	17.0	21.1	24 %	4.1	10.2	11.6	14 %	1.4
Photovoltaic	4.6	5.9	7.4	25 %	1.5	3.8	3.9	3 %	0.1
Renewable thermal	6.3	6.6	7.9	20 %	1.3	3.5	2.7	-24 %	-0.8
Consumption (TWh)	**462.0**	**435.0**	**443.0**	**2 %**	**8.0**	**230.7**	**232.2**	**1 %**	**1.5**

Source: RTE

Table 3: France imports and exports

				Annual variation 2014/2015				Variation HY1 2015 / HY1 2016	
	2013	2014	2015	As a percentage	As a value	HY1 2015	HY1 2016	As a percentage	As a value
Imports	**31.8**	**27.2**	**31.8**	**17 %**	**3.6**	**18.4**	**15.0**	**-18 %**	**-3.4**
Peak imports (TWh)	13.7	11.9	12.9	8 %	1.0	7.6	5.7	-25 %	-1.9
Off-peak imports (TWh)	18.1	15.3	18.9	23 %	3.6	10.8	9.3	-14 %	-1.5
Exports	**79.1**	**92.3**	**93.8**	**2 %**	**1.5**	**45.8**	**43.6**	**-5 %**	**-2.2**
Wind	15.9	17.0	21.1	24 %	4.1	10.2	11.6	14 %	1.4
Photovoltaic	4.6	5.9	7.4	25 %	1.5	3.8	3.9	3 %	0.1
Net export balance	**47.3**	**65.1**	**62.0**	**-5 %**	**-3.1**	**27.4**	**28.6**	**4 %**	**1.2**

Source: RTE

Table 4: Clean dark and spark spread and coal

				Annual variation 2015/2014				Variation HY1 2016 / HY1 2015	
	2013	2014	2015	As a percentage	As a value	HY1 2015	HY1 2016	As a percentage	As a value
Coal (€/t)	67.1	58.9	49.4	-16 %	-9.4	53.0	39.8	- 25 %	- 13.2
Peak clean dark spread (forward) (€/MWh)	30	19	22	+ 15 %	+ 3	21	14	- 35 %	- 7.5
Peak clean spark spread (forward) (€/MWh)	0.5	0.6	4.5	+ 700 %	+ 4	2.5	5.5	+ 130 %	+ 3

Source: Heren, ECX, EEX

Table 5: Review of injections and withdrawals in the French electricity system

				Annual variation 2015 / 2014				Half–year variation HY1 2016/HY1 2015	
	2013	2014	2015	As a percentage	As a value	HY1 2015	HY1 2016	As a percentage	As a value
Injections, in TWh									
Production, excluding ARENH and VPP, in TWh	478	466	529	14 %	63.2	270	284	5 %	13.7
ARENH, in TWh	64	71	16	-77 %	-55.1	12	0	-100 %	-12.4
VPP, in TWh	8	3	0	-89 %	-2.7	0	0.0	-100 %	-0.3
Imports, in TWh	32	27	32	16 %	4.4	18	15	-18 %	-3.3
Withdrawals, in TWh									
End customer consumption, in TWh	461	435	442	2 %	7.4	233	233	0 %	-0.2
Pumping, in TWh	7.1	7.9	6.8	-14 %	-1.1	3.6	3.5	-4 %	-0.1
Exports, in TWh	81	95	96	1 %	0.9	47	45	-4 %	-2.0
Losses, in TWh	34	31	33	9 %	2.7	18	18	-1 %	-0.2

Source: RTE

Table 6: Spot and forward prices in the French electricity market

				Annual variation 2015/2014				Variation HY1 2016/HY1 2015	
	2013	2014	2015	As a percentage	As a value	HY1 2015	HY1 2016	As a percentage	As a value
Spot market prices									
Intraday price France, in €/MWh	44.34	35.01	38.78	11 %	3.76	39.43	27.89	-29 %	-11.54
Day-Ahead price France baseload, in €/MWh	43.27	34.64	38.50	11 %	3.86	38.78	27.36	-29 %	-11.42
Day-Ahead price France peakload, in €/MWh	55.10	43.83	46.63	6 %	2.80	46.51	33.63	-28 %	-12.88
France-Germany Day-Ahead Baseload spread, in €/MWh	5.48	1.87	6.51	248 %	4.64	8.55	2.13	-75 %	-6.42
France-Germany Day-Ahead peakload spread, in €/MWh	6.40	2.84	8.99	216 %	6.15	9.56	2.73	-71 %	-6.83
Day-Ahead France-Germany convergence rate	47 %	51 %	27 %	-	-24 %	26 %	44 %	-	18 %
Forward market prices									
M+1 price France, in €/MWh	43.16	40.02	36.92	-8 %	-3.10	35.88	27.00	-25 %	-8.89
M+1 France-Germany spread, in €/MWh	5.41	6.51	5.95	-9 %	-0.57	5.11	2.43	-52 %	-2.68
Q+1 price France, in €/MWh	43.92	42.02	37.11	-12 %	-4.91	31.68	25.02	-21 %	-6.67
Q+1 France-Germany spread, in €/MWh	5.57	7.60	6.15	-19 %	-1.44	1.35	0.65	-51 %	-0.69
Y+1 price France, in €/MWh	43.32	42.48	38.14	-10 %	-4.33	38.83	28.96	-25 %	-9.87
Y+1 France-Germany spread, in €/MWh	4.24	7.38	7.18	-3 %	-0.20	6.80	5.09	-25 %	-1.71
Y+1 Peak/baseload ratios									
France	1.31	1.25	1.23	-2 %	-0.02	1.22	1.30	7 %	0.08
Germany	1.27	1.26	1.26	0 %	0.00	1.27	1.26	0 %	0.00

Source: EPEX SPOT, EEX

Table 7: Spot and forward volumes in the French electricity market

				Annual variation 2015/2014				Variation HY1 2016 /HY1 2015	
	2013	2014	2015	As a percentage	As a value	HY1 2015	HY1 2016	As a percentage	As a value
NEB									
NEB volumes, in TWh	307	339	503	48 %	164,2	230	289	26 %	59.8
NEB/French consumption ratio	67 %	78 %	114 %	-	35.8 %	99 %	124 %	-	25.8 %
Spot market, In TWh	**84.9**	**106.7**	**159.3**	**68 %**	**52.66**	**77.1**	**76.7**	**0 %**	**-0.32**
Volumes in the EPEX SPOT intraday market, in TWh	4.3	5.2	5.4	4 %	0.21	2.7	2.8	2 %	0.05
Portion of Intraday cross-border Fr-Ger volumes	61 %	72 %	62 %	-15 %	-0.11	58 %	71 %	22 %	0.13
Volumes in the EPEX SPOT Day-Ahead market, in TWh	58.5	67.8	106.4	57 %	38.54	49.9	58.0	16 %	8.12
Volumes in the Broker Day-Ahead market, in TWh	22.18	33.66	47.57	41 %	13.91	24.48	16.00	-35 %	-8.48
Forward market									
Volumes, in TWh	490.4	825.4	1111.9	35 %	286.5	556.6	658.7	25 %	132.14
Broker market share	97.9 %	95.7 %	91.1 %	-	-4.6 %	91.7 %	86.2 %	-	-5.5 %
EEX market share	2.1 %	4.3 %	8.9 %	-	4.6 %	8.3 %	13.8 %	-	5.5 %
Number of transactions	53 301	87 876	113 223	29 %	25344	55 554	47 998	-14 %	-7556
Broker market share	97.5 %	95.7 %	91.1 %	-	-2.0 %	93.1 %	92.1 %	-	-1.0 %
EEX market share	2.5 %	4.2 %	6.2 %	-	2.0 %	6.9 %	7.9 %	-	1.0 %
Y+1 product									
Volumes, in TWh	110.4	206.1	296.3	44 %	90.2	135.0	254.2	88 %	119.2
Number of transactions	2267	4020	6531	62 %	2511	2843	6022	112 %	3179
Q+1 product									
Volumes, in TWh	47.5	92.0	122.4	33 %	30.4	56.2	46.5	-17 %	-9.7
Number of transactions	2638	6699	8320	24 %	1621	3497	3282	-6 %	-215
M+1 product									
Volumes, in TWh	83.0	118.9	162.6	37 %	43.67	81.7	57.1	-30 %	-24.6
Number of transactions	8858	16288	24550	51 %	8262	12257	9136	-25 %	-3121

Source: EPEX SPOT, EEX, Brokers

Table 8: France imports and exports

				Annual variation 2015/2014				Variation HY1 2016 / HY1 2015	
	2013	2014	2015	As a percentage	As a value	HY1 2015	HY1 2016	As a percentage	As a value
Balance at borders, in TWh									
CWE zone	3.1	10.6	6.7	-37 %	-3.9	1.8	0.5	-74 %	-1.3
Spain	5.8	6.47	9.3	44 %	2.8	2.3	2.5	11 %	0.3
United Kingdom	10.5	15.1	13.9	-8 %	-1.2	7.3	7.7	5 %	0.4
Italy	15.3	19.3	19.7	2 %	0.4	9.8	10.6	8 %	0.8
Switzerland	16.5	16.4	14.1	-14 %	-2.4	6.2	7.4	18 %	1.1
Total	**47.3**	**65**	**63.7**	**-2 %**	**-1.34**	**27.4**	**28.6**	**4 %**	**1.2**

Source: RTE

2. NATURAL GAS MARKET

Table 9: Fundamentals of the gas market in France

Market fundamentals	Yearly values			Yearly variation 2015 / 2014				Yearly variation S1 2016 / S1 2015	
	2013	2014	2015	In percentage	In value	S1 2015	S1 2016	In percentage	In value
Entry and exit flows									
Supply (TWh)	687	624	648	4%	24	340	350	3%	9
Storages withdrawals	124	100	120	20%	20	79	70	-11%	-8
Imports	559	524	528	1%	4	262	279	7%	18
Pipeline	473	454	463	2%	9	230	241	5%	11
LNG	86	70	65	-7%	-5	31	38	21%	7
Production	4	0	0	54%	0	0	0	-13%	0
Demand (TWh)	687	624	648	4%	24	340	350	3%	9
Storages injections	116	116	115	-1%	-1	42	49	16%	7
End consumers demand	497	416	448	8%	32	257	260	1%	3
Distribution consumers	335	271	289	7%	18	177	177	0%	0
Consumers connected to the transmission system	162	145	160	10%	15	80	83	3%	3
Exports	67	87	87	0%	0	38	66	71%	27
Other	6	5	-2	-137%	-7	2	-25	-1164%	-27
Deliveries at PEGs (TWh)	581	585	687	18%	103	343	388	13%	45
PEG Nord	442	452	546	21%	94	274	314	15%	40
TRS*	139	133	141	6%	9	69	73	7%	5
Infrastructure figures									
North-to-south link	94%	94%	90%		-4%	88%	92%		4%
Availability of North-to-south link	77%	86%	83%		-4%	82%	83%		2%
Utilization of Taisnieres H interconnection (Entry)	69%	74%	69%		-4%	73%	63%		-10%
Utilization of Obergailbach interconnection (Entry)	65%	44%	33%		-11%	36%	42%		5%
Utilization of Pirineos* interconnection (Exit)	76%	79%	57%		-21%	61%	45%		-16%
Stock levels (TWh as at the end of the Quarter)	74	96	83	-13%	-13	83	78	-7%	-6
Avg. Net variation of French stocks (GWh/j)	22	-11	-8	-28%	3	-33	16	-147%	49
Avg. LNG terminals senf-out (GWh/j)	236	190	179	-6%	-11	174	208	19%	34
Avg. Exports from France to Spain (GWh/j)	115	134	101	-25%	-33	103	102	-2%	-2

* Larrau and Biriatou average figures before the virtual interconnection point Pirineos creation date (01/10/2014)

Table 10: Price of gas in France

Prices	Yearly values			Yearly variation 2015 / 2014				Yearly variation S1 2016 / S1 2015	
	2 013	2 014	2 015	In percentage	In value	S1 2015	S1 2016	In percentage	In value
Spot prices (€/MWh)									
PEG Nord day-ahead (avg.)	27.6	21.4	20.1	-6%	-1.3	21.5	13.2	-39%	-8.3
TRS* day-ahead (avg.)	30.5	25.0	21.6	-14%	-3.5	22.3	13.5	-39%	-8.7
Day-ahead PEG Nord/Sud spread (avg.)	2.8	3.5	0.5	-85%	-2.9	0.5	0.3	-34%	-0.2
Day-ahead PEG Nord/TTF Spread (avg.)	0.6	0.5	0.3	-49%	-0.2	0.4	0.2	-47%	-0.2
Forward prices (€/MWh)									
PEG Nord M+1 (avg.)	27.2	21.9	19.9	-9%	-2.0	21.3	13.0	-39%	-8.3
TRS* M+1 (avg.)	32.5	25.7	20.5	-20%	-5.1	21.8	13.5	-38%	-8.3
PEG Nord Y+1 (avg.)	27.1	24.8	20.4	-18%	-4.4	21.9	14.8	-32%	-7.1
M+1 PEG Nord/Sud spread (avg.)	4.4	3.8	0.6	-84%	-3.2	0.6	0.5	-11%	-0.1
M+1 PEG Nord/TTF spread (avg.)	0.5	0.4	0.3	-30%	-0.1	0.4	0.2	-50%	-0.2
Summer-ahead/Winter-ahead spread (avg.)	1.6	3.4	1.5	-56%	-1.9	1.6	1.8	9%	0.1

* Before 1 April 2015 (TRS implementation), prices are the average of PEG Sud and TIGF

Table 11: Gas trading in France

Trading activity	Yearly values			Yearly variation 2015 / 2014				Yearly variation S1 2016 / S1 2015	
	2 013	2 014	2 015	In percentage	In value	S1 2015	S1 2016	In percentage	In value
Wholesale markets activity in France									
Natural gas exchanged at PEG (TWh)	422	485	556	15%	71	284	293	3%	8
% of national consumption	85%	117%	124%		7%	111%	113%		2%
Trading volumes in the French intermediated markets									
Spot market (TWh)	154	153	176	15%	23	90	91	1%	1
Intraday	16	16	18	17%	2.6	8.8	13.3	50%	4.5
Day Ahead	84	90	101	12%	11.0	51.8	50.8	-2%	-1.1
Exchange (DA, WD, WE, other spot)	70	93	117	26%	23.8	57.2	63.7	11%	6.5
Brokers (DA, WD, WE, other spot)	83	61	59	-2%	-1.2	32.6	27.4	-16%	-5.2
Forwards market (TWh)	295	372	429	15%	57	211	263	25%	52
M+1	86	111	106	-4%	-4.5	48.5	57.7	19%	9.3
Q+1	25	43	50	16%	7.0	20.9	17.5	-16%	-3.4
S+1	84	102	74	-27%	-27.5	51.9	48.0	-7%	-3.9
Y+1	14	15	46	214%	31.1	9.1	4.4	-52%	-4.7
Exchange (all maturities)	29	41	35	-14%	-5.9	21.1	24.0	14%	2.9
Brokers (all maturities)	265	332	394	19%	62.6	189.7	238.9	26%	49.2
Number of transactions in the French intermediated markets									
Spot market	98 585	120 319	136 695	14%	16376	68215	66222	-3%	-1993
Intraday	18 462	21 952	24 408	11%	2456	12365	14431	17%	2066
Day Ahead	64 892	81 162	91 239	12%	10077	45483	42770	-6%	-2713
Exchange (DA, WD, WE, other spot)	64 843	90 590	110 954	22%	20364	54610	54396	0%	-214
Brokers (DA, WD, WE, other spot)	33 742	29 729	25 741	-13%	-3988	13605	11826	-13%	-1779
Forwards market	3 929	5 405	5 841	8%	436	2661	3102	17%	441
M+1	2 483	3 320	3 206	-3%	-114	1467	1635	11%	168
Q+1	228	400	553	38%	153	196	206	5%	10
S+1	387	598	488	-18%	-110	334	278	-17%	-56
Y+1	75	91	241	165%	150	54	39	-28%	-15
Exchange (all forward maturities)	1 061	1 614	1 323	-18%	-291	632	663	5%	31
Brokers (all forward maturities)	2 868	3 791	4 518	19%	727	2029	2439	20%	410
Concentration of the natural gas market in France									
Numbers of shippers active in the market	96	106	110	4%	4	103	98	-5%	-5
Active in Powernext Gas Spot	43	53	53	0%	0	51	53	4%	2
Active in Powernext Gas Futures	33	39	39	0%	0	35	44	26%	9

Table 12: Trade statistics for the French organised and brokered markets

	2013	2014	2015	HY1 2015	HY1 2016	2015 / 2014	HY1 2016 / HY1 2015
Volume traded (TWh)							
Spot	154	152	175	90	90	15%	1%
day-ahead	84	90	101	52	51	12%	-2%
Forwards	295	373	431	211	263	15%	25%
month	102	130	130	59	72	0%	22%
season	140	165	146	98	131	-11%	34%
Total intermediated market	448	526	606	301	354	15%	18%
Nombre de transactions							
Spot	98 583	120 274	136 607	68 193	66 184	14%	-3%
day-ahead	64 892	81 162	91 239	45 483	42 770	12%	-6%
Forwards	3 931	5 450	5 924	2 682	3 134	9%	17%
month	2 880	3 851	3 793	1 662	1 969	-2%	18%
season	614	894	883	592	657	-1%	11%
Total intermediated market	102 514	125 724	142 531	70 875	69 318	13%	-2%
Most commonly trades volumes (MWh/j)							
Spot	1000 (31%)	1000 (44%)	1000 (48%)	1000 (45%)	1000 (52%)		
day-ahead	1000 (33%)	1000 (49%)	1000 (53%)	1000 (51%)	1000 (56%)		
Forwards	720 (45%)	720 (39%)	720 (40%)	720 (44%)	720 (42%)		
month	720 (46%)	720 (40%)	720 (40%)	720 (43%)	720 (43%)		
season	720 (43%)	720 (40%)	720 (49%)	720 (53%)	720 (44%)		
Total intermediated market	1000 (30%)	1000 (43%)	1000 (46%)	1000 (44%)	1000 (49%)		

SECTION 1
INTEGRATION OF WHOLESALE MARKET SURVEILLANCE IN THE EUROPEAN SYSTEM

Pursuant to the provisions of Article L. 131-2 of the French Energy Code, CRE "*monitors electricity and natural gas transactions carried out between suppliers, traders and producers, transactions carried out on the organised markets as well as cross-border trades. It monitors the consistency of the offers [...] made by producers, traders and suppliers [...] with their economic and technical constraints".* CRE's mission to monitor wholesale markets therefore aims at ensuring that prices in the wholesale energy markets are consistent with the technical and economic fundamentals of these markets.

Since 28 December 2011, CRE's wholesale energy market surveillance mission has also been governed by the European regulation on the integrity and transparency of wholesale energy markets (EU Regulation No. 1227/2011 of 25 October 2011) known as REMIT. In that regard, Article L.131-2 of the Energy Code henceforth states that CRE shall "*guarantee compliance with Articles 3, 4, 5, 8, 9 and 15*" of that regulation. In particular, CRE shall ensure compliance with:

- the transparency obligations specified in Article 4 of REMIT concerning the publication of inside information;
- prohibition of market abuse specified in Article 3 (insider trading) and Article 5 (market manipulation);
- the obligation for market participants to provide the Agency with a record of wholesale energy market transactions, including orders to trade (Article 8);
- the obligation for market participants to register (Article 9);
- the obligations of persons professionally arranging transactions in the event of a suspicion of market abuse (Article 15).

Following the adoption of the implementing regulation on transaction data reporting in the wholesale electricity and gas markets (Implementing Regulation (EU) No. 1348/2014 of 17 December 2014), the implementation of the REMIT regulation entered an operational deployment phase at European and national level.

1. A COMPLETE AND FULLY OPERATIONAL LEGAL FRAMEWORK

Law No. 2013-312 of 15 April 2013[1] amended the Energy Code to entrust CRE with guaranteeing compliance with the obligations and prohibitions specified by the REMIT regulation. When CRE detects or is informed of any potential breaches of the provisions of the REMIT regulation, it may carry out investigations. Law No. 2013-312 of 15 April 2013 introduced provisions in the Energy Code concerning CRE's sanctioning powers. Therefore, if breaches are proven, CRE's standing committee for disputes and sanctions (CoRDiS) can carry out sanctions.

The law was supplemented by order No. 2016-461 of 14 April 2016[2] which in particular amended Articles L. 131-2 and L. 134-25 of the Energy Code to specify CRE's competence as regards the collection of information, registration as well as obligations of persons professionally arranging transactions.

The legal framework therefore is now complete and fully operational and enables CRE, within the framework of REMIT, to:

- monitor the wholesale markets;
- conduct investigations in the event of suspected market manipulation;
- refer cases to CoRDiS which has the power to sanction breaches.

2. CONSTITUTION OF A EUROPEAN REGISTER OF PARTICIPANTS BASED ON NATIONAL REGISTERS

The REMIT regulation provides that before reporting their data, market participants must register with the national regulatory authority (NRA) in the Member State in which they are established or, if they are not established in the Union, with the NRA of a Member State in which they are active[3]. Being responsible for the information contained in the national register, these participants are required to communicate promptly to the NRA any changes in the information they provided[4]. In France, CRE chose to use the CEREMP (Centralised European Register for Market

[1] See law no. 2013-312 of 15 April 2013
[2] Consult the text of order no. 2016-461 of 14 April 2016
[3] Consult the fourth edition of ACER's guidance on this subject
[4] See Article 9(5) of REMIT

Participants) system developed by the Agency for the Cooperation of Energy Regulators (ACER), accessible since 7 October 2014. A page on CRE's website is dedicated to REMIT[5] and provides access to the registration platform.

All of the information related to the information to be reported is specified in the annex to the implementing regulation. On this point, specifications are also provided in ACER's technical documents available on the REMIT portal[6]. At the end of August 2016, 1,056 market participants were registered with CRE.

On the basis of the information provided by the NRAs, ACER establishes a European register of market participants. This register is regularly updated and part of the information it contains is made public[7], in particular, the name of each market participant, its ACER code and the website dedicated to the publication of any inside information that concerns it.

3. START OF DATA REPORTING AT EUROPEAN LEVEL

At European level, ACER began to collect transaction data for standard contracts on 7 October 2015, while the collection of non-standard contract data began on 7 April 2016. As of those dates, participants active in the wholesale market had to be registered in the European register.

In addition, data relating to the following can be collected on an ad hoc basis upon reasoned request by ACER[8]:

- intragroup contracts;
- contracts for the physical delivery of electricity produced by a single production unit with a capacity equal to or less than 10 MW or by production units with a combined capacity equal to or less than 10 MW;
- contracts for the physical delivery of natural gas produced by a single gas production facility with a capacity equal to or less than 20 MW;
- contracts for balancing services in electricity and natural gas.

Moreover, REMIT specifies that the collection of data by ACER is without prejudice to the NRAs' right to collect additional data for national purposes[9].

For all European markets, this collection is done via reporting entities, which can be the market participants themselves when they have been accredited as a "registered reporting mechanism" (RRM) or through a third-party RRM. When possible, collection is centralised with these reporting entities. Exchanges, including EPEX, EEX and Powernext, as well as broker platforms are some such reporting entities.

To assist in the application of the implementing regulation, ACER published documents specifying the criteria for collecting transaction data and updates them regularly. In particular, the Transaction Reporting User Manual (TRUM) and the Manual of Procedures on transaction and fundamental data reporting (MOP) provide elements for understanding the regulation and conditions for data reporting[10]. Lastly, ACER specified the registration criteria for reporting entities in the "RRM requirements" document together with videos detailing the procedures they must follow.

CRE held an information meeting with market participants active in France on 9 June 2015. Specific meetings were also held with renewable energy producer associations and local distribution companies. These meetings presented the REMIT regulation and its operational implementation to market participants. All of these documents are available on CRE's website[11]. In 2015 and the first half of 2016, CRE also made a significant effort to assist market participants and aid with the understanding of the regulation in order to answer their practical questions concerning registration and data reporting obligations.

The data collected by ACER are retransmitted to the relevant NRAs to enable them to carry out their surveillance activities. The data can also be transmitted to other competent authorities (financial and competition authorities, etc.), subject to compliance with strict confidentiality and data protection requirements. In application of the provisions of Articles 10, 11 and 12 of the REMIT regulation, ACER ensures the confidentiality, integrity and protection of the information received and gives access to information-sharing mechanisms only to authorities

[5] See the relevant pages: http://www.cre.fr/marches/remit
[6] Consult the TRUM, MoP, standard contracts and the list of organised marketplaces
[7] See the European register of market participants
[8] See ACER's no-action relief letter concerning the deadline of 31 December 2016 for reporting this data
[9] See recital (17) of REMIT
[10] ACER publishes other useful information for market participants in this area: the list of organised market places (OMP), the list of standard contracts, the list of registered reporting mechanisms (RRM) with the type of data they report, the monthly update of answers to questions most frequently asked by market participants (REMIT Q&A), the REMIT quarterly. These documents which are regularly updated are accessible on the ACER ACER REMIT portal (https://www.acer-remit.eu/portal/public-documentation).
[11] See the page devoted to REMIT

that have set up systems enabling them to comply with these requirements. In that regard, ACER has implemented a complex certification procedure for NRAs' security policies, in particular concerning their IT security systems.

CRE is one of the first regulators to have its IT security systems certified by ACER, which is a pre-condition for receiving collected data.

Within this framework, the year 2016 is a transitional year, since for several months now CRE has begun to receive flows of information relayed by ACER on a daily basis. In addition, CRE continues to collect data directly from market participants and has extended, on a transitional basis, the national data collection system. Indeed, CRE participates actively in the analysis led by ACER in order to test the quality and completeness of data collected at European level. In the long run, CRE's analyses will be based mainly on the data collected by ACER, supplemented, where appropriate, by the collection of information deemed necessary by CRE at national level.

In addition, CRE contributes actively to the implementation of the REMIT regulation, in particular by taking part in the working groups of the Council of European Energy Regulators (CEER) and ACER on market integrity and transparency. Moreover, it lends its expertise to the coordination group created by ACER in 2015 and contributes, in coordination with ACER and on a bilateral basis with several regulators in bordering countries, to the sharing of methodologies and good practices as concerns energy market surveillance. Bilateral meetings are also regularly held among regulators.

This work serves to address:

- matters relating to the operational implementation of REMIT, and in particular, the IT and security aspects of data transmission and exchange systems;
- issues relating to tools, methods and means of surveillance;
- harmonisation of the answers to be provided to questions raised by European participants;
- matters relating to the coordination of investigations in the event of a detection of cross-border market abuse.

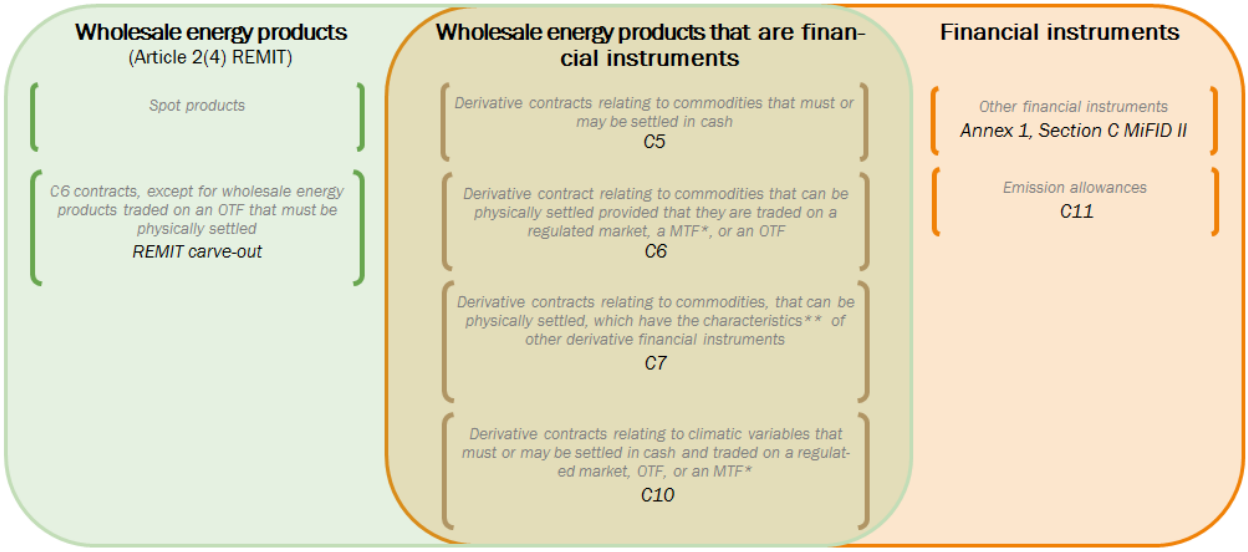
4. LINK WITH FINANCIAL REGULATION

Implementation of the REMIT regulation takes into account and is linked with financial regulation. Article 3 (prohibition of insider training) and Article 5 (prohibition of market manipulation) do not apply to wholesale energy products which are also qualified as financial instruments in accordance with financial regulations[12]. In particular, the directive[13] and regulation[14] relating to markets in financial instruments (known as MIF II[15]), adopted in May 2014, as well as the regulation and directive relating to market abuse (MAD II[16] and MAR[17]), which revise current regulations, will apply to these products.

[12] See Article 1(2) of REMIT (Regulation (EU) No 1227/2011)
[13] Consult the Directive (EU) 2014/65/EU of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC
[14] Consult the Regulation (EU) 600/2014 of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012
[15] MIF II therefore refers to the MiFID II directive and the MiFIR regulation
[16] Consult directive (EU) 2014/57/EU of 16 April 2014 on criminal sanctions for market abuse
[17] Consult regulation (EU) 596/2014 of 16 April 2014 on market abuse

Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU (MiFID II) in particular extended the definition of financial instruments to include contracts traded on an organised trading facility (OTF) and CO_2 emission allowances[18]. Therefore, derivatives and underlying gas and electricity traded on an OTF can also fall within the scope of financial regulation, with the exception of wholesale forward energy products (within the meaning of REMIT) which **must be** physically settled[19] (an exception known under the term 'REMIT carve-out').

Graph 1: Simplified classification of wholesale energy products and financial instruments (MiFID II)



* MTF: Multilateral trading facilities

** These characteristics are specified in Article 38 of Regulation (EU) No 600/2014 on markets in financial instruments (MiFIR)

Classification C5-C11 is described in section C of Annex I of Directive 2014/65/EU.

Sources: Directives 2003/06/EC; 2004/39/EC; 2014/57/EU; 2014/65/EU and Regulations (EU) 648/2012; 596/2014; 600/2014 and Delegated regulation of 25 April 2016 supplementing Directive 2014/65/EU and Regulation (EU) No. 1227/2011 –

Analysis: CRE

[18] See Annex I, section C (11) of Directive 2014/65/EU
[19] See Annex I, section C (6) of Directive 2014/65/EU

Specifications about the definition of products not falling within the scope of financial regulation are made by the Delegated regulation of 25 April 2016 of the European Commission[20] (Article 5[21] and Article 8[22] in particular). This text lifts major uncertainty about the legal regime applicable in terms of market abuse.

The provisions of the abovementioned directives are currently being transposed by each European Union Member State into its national legislation. On 10 February 2016, the European Commission postponed to 3 January 2018 the entry into effect of the MiFID II package, initially scheduled for early 2017, in order to give sufficient time to participants and competent authorities to set the appropriate systems.

The directive and regulation on market abuse (MAD II and MAR) entered into effect on 3 July 2016. They extend the scope of application of the provisions concerning market abuse:

- to contracts traded in regulated markets (RM) and multilateral trading facilities (MTF);
- to financial instruments traded in organised trading facilities (OTF) and to OTC derivatives and spot commodities, excluding wholesale energy products, which can influence the prices of contracts traded in the regulated markets, MTFs and OTFs.

MAR also explicitly prohibits manipulation of benchmarks and introduces a specific regime for whistleblowers. Persons professionally arranging or executing transactions (PPAET) are required to set up surveillance tools and means to report suspicious transactions and orders. Lastly, new provisions strengthen financial regulators' powers to investigate and sanction, propose common principles, particularly in terms of maximum sanction, and provide for the introduction of penal sanctions by Member States.

With regard to the prohibition of market abuse, a wholesale energy product is therefore likely to fall within the scope of application of either REMIT or of financial regulation based on its maturity, platform of negotiation and the application or non-application of this exception. Nevertheless, REMIT remains in any event applicable to wholesale energy products which are also qualified as financial instruments regarding obligations to publish inside information (Article 4), to report information to ACER (Article 8) and to register (Article 9). It should however be noted that reporting obligations in accordance with the provisions of Article 8 of REMIT do not apply to participants that have fulfilled their obligations under the European Market Infrastructure Regulation (EMIR)[23], in order to prevent double reporting[24]. As such, the information collected by central counterparties and trade repositories concerning wholesale energy products qualified as financial instruments is also reported to ACER.

[20] Consult the delegated regulation supplementing directive 2014/65/EU of 25 April 2016 of the European Commission

[21] These criteria are defined as follows:

*"a wholesale energy product **must be physically settled** where all the following conditions are satisfied:*

it contains provisions which ensure that parties to the contract have proportionate arrangements in place to be able to make or take delivery of the underlying commodity; a balancing agreement with the Transmission System Operator in the area of electricity and gas shall be considered a proportionate arrangement where the parties to the agreement have to ensure physical delivery of electricity or gas;

(b) it establishes unconditional, unrestricted and enforceable obligations of the parties to the contract to deliver and take delivery of the underlying commodity;

(c) it does not allow either party to replace physical delivery with cash settlement;

(d) the obligations under the contract cannot be offset against obligations from other contracts between the parties concerned, without prejudice to the rights of the parties to the contract, to net their cash payment obligations.

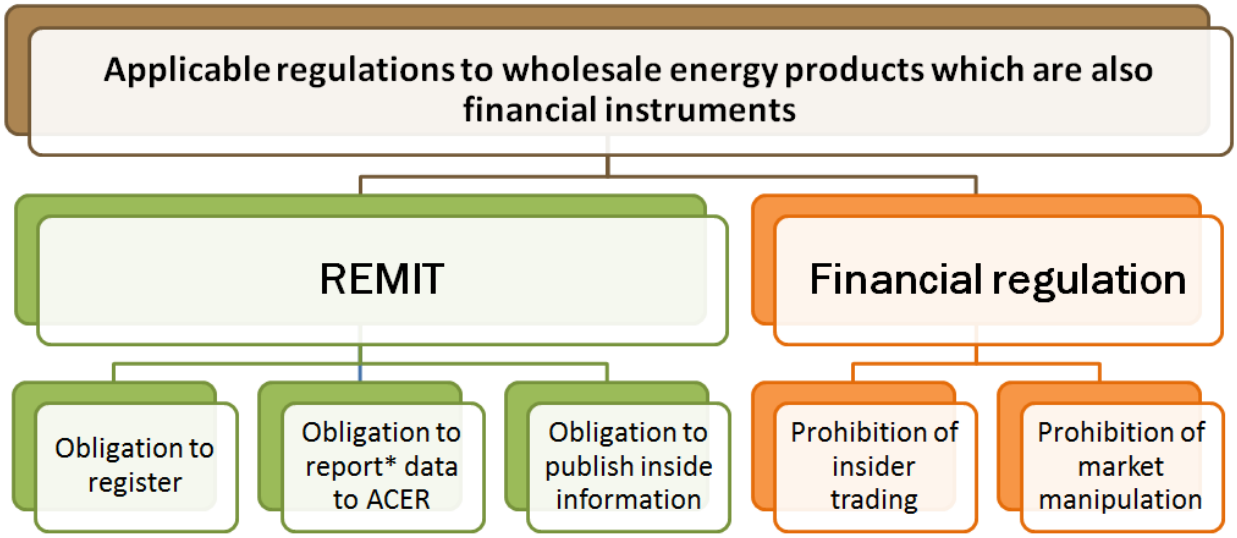
For the purposes of point (d), operational netting in power and gas markets shall not be considered as offsetting of obligations under a contract against obligations from other contracts".

[22] Transmission rights related to electricity transmission cross zonal capacities when they are, on the primary market, entered into with or by a transmission system operator or any persons acting as service providers on their behalf and in order to allocate the transmission capacity are expressly excluded from the definition of financial instrument. (Article 8)

[23] Consult Regulation (EU) No 648/2012 of 4 July 2012

[24] See Article 8(3) of REMIT. In March 2013, technical standards concerning the EMIR regulation entered into effect. They describe the reporting obligations applicable to market participants' derivative contracts with central counterparties (Consult Commission Delegated Regulation (EU) No 153/2013 of 19 December 2012 supplementing Regulation (EU) No 648/2012 of the European Parliament and of the Council with regard to regulatory technical standards on requirements for central counterparties)

Graph 2: Financial regulation and wholesale energy products



* This obligation however does not apply when participants have fulfilled the reporting obligation under financial regulation.

Sources: Directives 2003/06/EC; 2004/39/EC; 2014/57/EU; 2014/65/EU and Regulations (EU) 648/2012; 596/2014; 600/2014 and Delegated regulation of 25 April 2016 supplementing Directive 2014/65/EU and Regulation (EU) No 1227/2011 –

Analysis: CRE

Lastly, MiFID II specifies exemptions from the qualification of investment service providers for persons dealing on own account (or who provide investment services other than dealing on own account to the customers or suppliers of their main business) in commodity derivatives or emission allowances or derivatives thereof. Market participants that wish to be exempt from this qualification and the resulting obligations must pass two tests, one which compares the ancillary activity of a group to the total size of the EU market, and the other, an intragroup test to determine if the size of the ancillary activity is proportionate to the total size of the group's trading business. This second test is being drafted by the European Commission.

At national level, the interaction between REMIT and financial regulation is the subject of regular discussions between CRE's and AMF's (French financial authority) departments within the framework of the cooperation agreement between the two institutions.

5. SURVEILLANCE OF WHOLESALE MARKETS

Within the framework of its wholesale market surveillance mission, CRE may be required to conduct analyses following the detection of an unusual or suspicious market event. This detection may be done by:

- CRE's wholesale market surveillance department;
- persons professionally arranging transactions, who must immediately alert the national regulatory authority if they suspect a breach of Articles 3 and 5 of REMIT. In that regard, a notification platform was set up by ACER for all notifications of suspected breaches of REMIT[25];
- ACER within the framework of its market surveillance activities. In the event of a suspected market abuse or non-disclosure of inside information, ACER may request CRE to carry out an investigation. If ACER considers that a potential breach of REMIT has a cross-border impact, it may establish and coordinate an investigation group with the relevant NRAs, as well as representatives of financial regulators or of any other relevant authority;
- any other actor that suspects a breach of REMIT and informs CRE. The notification platform set up by ACER can also be used by these actors.

[25] See the suspicious transactions reporting platform

When CRE detects or is informed of an unusual event, it conducts an in-depth analysis to determine if there is a potential breach of REMIT or if the event pertains to another breach that may seriously affect the functioning of the energy markets. When the launch of an investigation has been decided, CRE's chairman appoints the officer responsible for conducting it.

In 2015, CRE sent 13 requests for information to operators within the framework of in-depth analyses. Six of them were made as of the first half of 2016.

To date, three formal investigations have been opened by CRE, one for electricity and two for gas.

The investigation related to the electricity market dealt with a suspected market abuse in connection with information related to a production plant. It was not referred to CoRDiS since it pertained to transactions occurring prior to the adoption of the law of 2013 which empowered CoRDiS to sanction any breaches of the REMIT regulation. Given the lessons learned from this investigation, CRE considers it relevant to reiterate to all market participants their obligation to publish inside information (box).

Obligation to publish inside information

The REMIT regulation requires market participants to publish inside information (Article 4) and prohibits market abuse (Articles 3 and 5).

REMIT defines inside information as "*information of a precise nature which has not been made public, which relates, directly or indirectly, to one or more wholesale energy products and which, if it were made public, would be likely to significantly affect the prices of those wholesale energy products.*" Examples and details concerning the scope of this notion are provided in the ACER non-binding guidance. Drawn up in cooperation with national regulators, including, CRE, these guidelines are published on ACER's website[26] and are regularly updated.

The determination of what is considered inside information is the responsibility first of all, of market participants. They must evaluate the precise and non-public nature of the information they hold and any influence it might have on market prices.

As specified by REMIT, the information does not have to be certain for it to be considered precise. The fact that a piece of information concerns an event whose probability of occurrence is uncertain is not enough to make it any less potentially precise within the meaning of the REMIT regulation, and therefore, the obligation to publish inside information (Article 4) remains.

Determination of the precise or unprecise nature of a piece of information, must, in any event be analysed on a case-by-case basis based on the nature of the information and taking into account the general context. This is reiterated by ACER in section 5.2 of the fourth edition of its guidance published on 17 June 2016.

Regarding in particular information relating to means of production, the events likely to affect the level of supply may have an influence on market prices. For example, estimates of the risk of losses (with figures) at one or several production sites at a given timeframe, once identified by the market participant, even though they are still uncertain, are likely to fall within the scope of REMIT's publication obligation.

In addition, a piece of information can be considered public if it is accessible from an electronic platform dedicated to the publication of information on the wholesale energy market. In that regard, ACER makes reference to the sectoral publicity.

Publication on the portal intended for that purpose by RTE may meet the requirements concerning accessibility of the information by the public. The notion of public, may in fact be understood as broad trading public, as ACER specifies in section 5.3 of its guidance.

When market participants register in the national register, they must indicate which platform for the disclosure of inside information they use. The list of these platforms is accessible on ACER's REMIT portal[27].

CRE intends to reiterate that each market participants is responsible for publishing the inside information it holds as explicitly as possible and stating the level of certainty of the information disclosed. Market participants must ensure follow-up and update its publications.

CRE monitors the compliance of operations and practices of market participants with the requirements of REMIT, particularly in terms of the publication of inside information, as part of its market surveillance missions.

[26] Guidance on the application of Regulation (EU) No. 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency – 4th Edition – 17 June 2016. Available on ACER's REMIT portal (https://www.acer-remit.eu/portal/custom-category/remit_guidance_and_recommendations)
[27] https://www.acer-remit.eu/portal/list-inside-platforms

SECTION 2
CONTEXT OF THE ENERGY MARKETS

Wholesale energy market trends developed against the drop in the prices of raw materials, oil, coal and gas throughout 2015. Prices rebounded in the first months of 2016 and caused forward electricity prices to increase along with them.

In terms of weather, the year 2015 was once again warmer than usual; according to Météo France, it was one of the three warmest years since 1900. Rainfall was lower than normal in 2015 and led to a drop in hydroelectric power generation, especially in the second half of 2015, and an increase in electricity spot prices, against the movement of raw materials and forward prices.

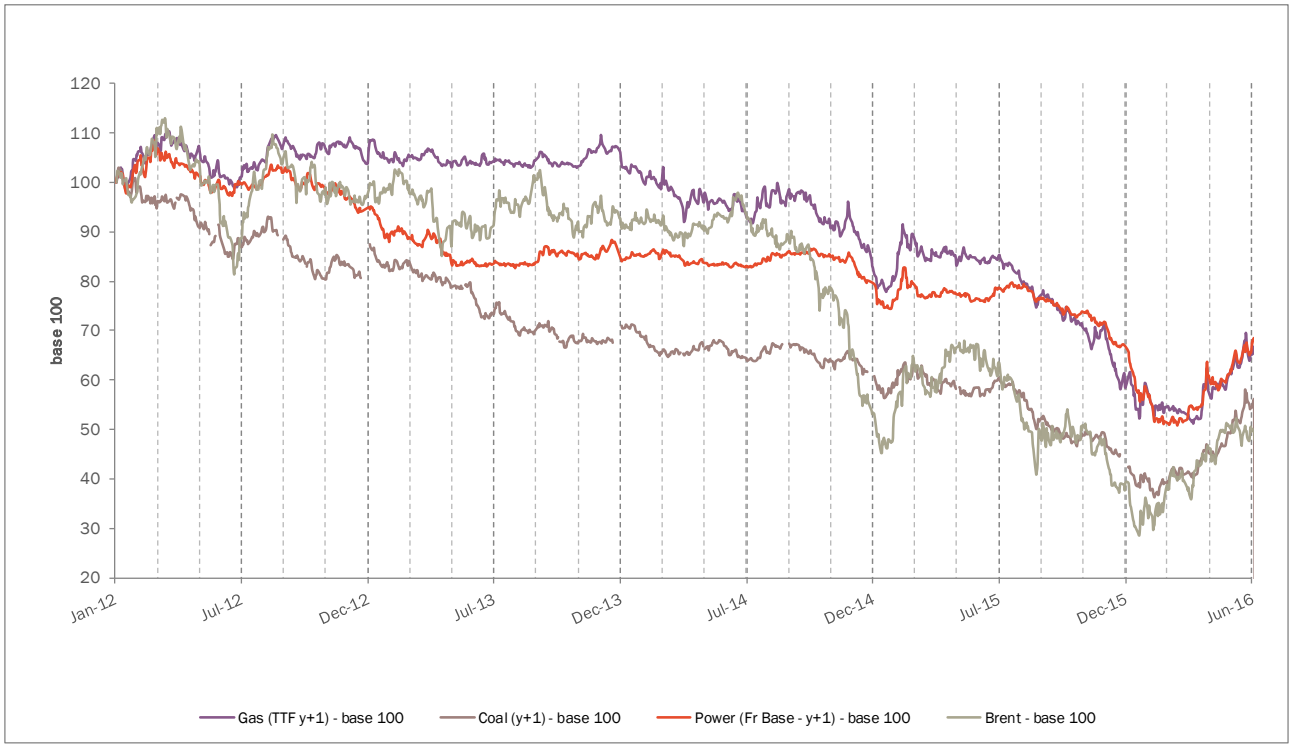
Prices of CO_2 allowances remain very low, despite the partial reduction in surplus allowances in the European market. In April 2016, the French President announced the implementation in 2017 of a floor price for CO_2 allowances for electricity production in France. This floor price, according to precisions provided by the Minister for energy and the environment in July 2016, would be applied only to coal plants.

1. DROP IN RAW MATERIAL PRICES CONTINUED IN 2015 BUT PRICES ON THE REBOUND SINCE EARLY 2016

The major drop in the prices of the main energy commodities (oil, coal, gas and electricity) continued in 2015, and in January 2016 they reached the lowest level seen since the 2008 economic and financial crisis (Graph 3). This trend confirmed the abundant supply (particularly in oil markets) and relatively low demand affected by the slowdown in global growth[28].

This trend however reversed course in 2016, with raw material prices picking up as from the second quarter of 2016 adjusting to better economic prospects and specific episodes of tightness in short-term fundamentals. Among other things, there was a drop in oil production from non-OPEC countries, an increase in coal consumption in China and a drop in gas flows from Norway to Europe. Despite this correction, prices remained at low levels compared to those recorded in 2013.

Graph 3: Evolution in commodity prices (index base 100 = 01/01/2012)



Source: EEX, ICIS Heren, Reuters, ICE

[28] Global primary energy consumption increased 1 % in 2015, i.e. the weakest growth (with the exception of the 2009 economic crisis) since 1998 (source: *BP statistical review*).

1.1 Excess supply kept oil prices at very low levels

Oil prices continued the trend seen in 2014: the Brent stood at an average €47.2 per barrel in 2015, i.e. a 36 % drop compared to 2014. This difference is even greater in dollars because of the appreciation of the dollar compared to the euro in 2015[29] (Graph 4).

Graph 4: Evolution in the price of oil

Source: Reuters

The drop in oil prices in 2015 stemmed in particular from the excess supply created by the increase in shale oil production in the USA and the lack of price support measures by OPEC countries. Tensions in Yemen partly explain the pickup period observed between March and May 2015. In turn, the drop in prices encouraged global consumption, which increased 1.9 % in 2015, compared to 1.0 % in 2014. Excess oil production and high stock levels in the USA and China exacerbated the drop in prices as from August 2015 and price pressure continued until mid-January 2016, when the Brent reached a minimum level of €24.7 per barrel (20 January), i.e. the lowest levels seen since the 2008 economic and financial crisis.

This very low price episode was followed by a notable correction in the second quarter of 2016. For this quarter, the Brent price stood at an average €31.0 per barrel, i.e. a 26 % increase compared to the first quarter of 2016. This movement is due to brighter prospects for growth in demand, a slowdown in US production and by several production problems (in particular fires in Alberta, Canada, and attacks on production sites in Nigeria). Prices went back to their levels of August 2015 but remained well below the levels seen in 2013.

1.2 Pickup in coal prices since early 2016 and evolution of gas prices favouring demand by combined-cycle plants

Contrary to what may have been observed in 2014, gas prices in 2015 saw a greater downward trend compared to that of coal. In 2014, coal prices had been heavily affected by the excess supply resulting from the drop in US demand. In 2015, it was European gas prices that were the most heavily affected by the drop in oil prices and their convergence with the prices of Asian gas (Section IV, Chapter 2.2). This led to a major reduction in the differences between the prices of gas and that of coal (Graph 3).

The price differences between these two raw materials narrowed in 2016 with the more marked increase in coal prices. Low ARA[30] coal stock levels are behind this trend. After a low point at €32.4/t at the start of 2016, coal

[29] The average Brent price in 2015 was €52.4 per barrel, i.e. a 47 % drop compared to the level seen in 2014.
[30] European reference. This is coal delivered in the Amsterdam-Rotterdam-Anvers region.

prices increased quickly in the second half of 2016, reaching €50.1/t as at 30 June 2016. Forward electricity prices increased as a result of this pickup (Section III, Chapter 2.2).

Within this context, competitiveness of European gas-fired power plants was favoured in 2015: in France gas-fired power generation increased 54.8 % compared to the previous year (Section III, Chapter 1.4 and Section IV, Chapter 1.1).

2. ANOTHER YEAR MARKED BY TEMPERATURES ABOVE NORMAL WITH A PARTICULARLY MILD 2015-2016 WINTER

Temperatures in 2015 were on average 1.07°C higher than normal season averages. According to Météo France, the year 2015 is the third warmest year since 1900, behind 2011 (+1.1°C) and 2014 (+1.2°C).

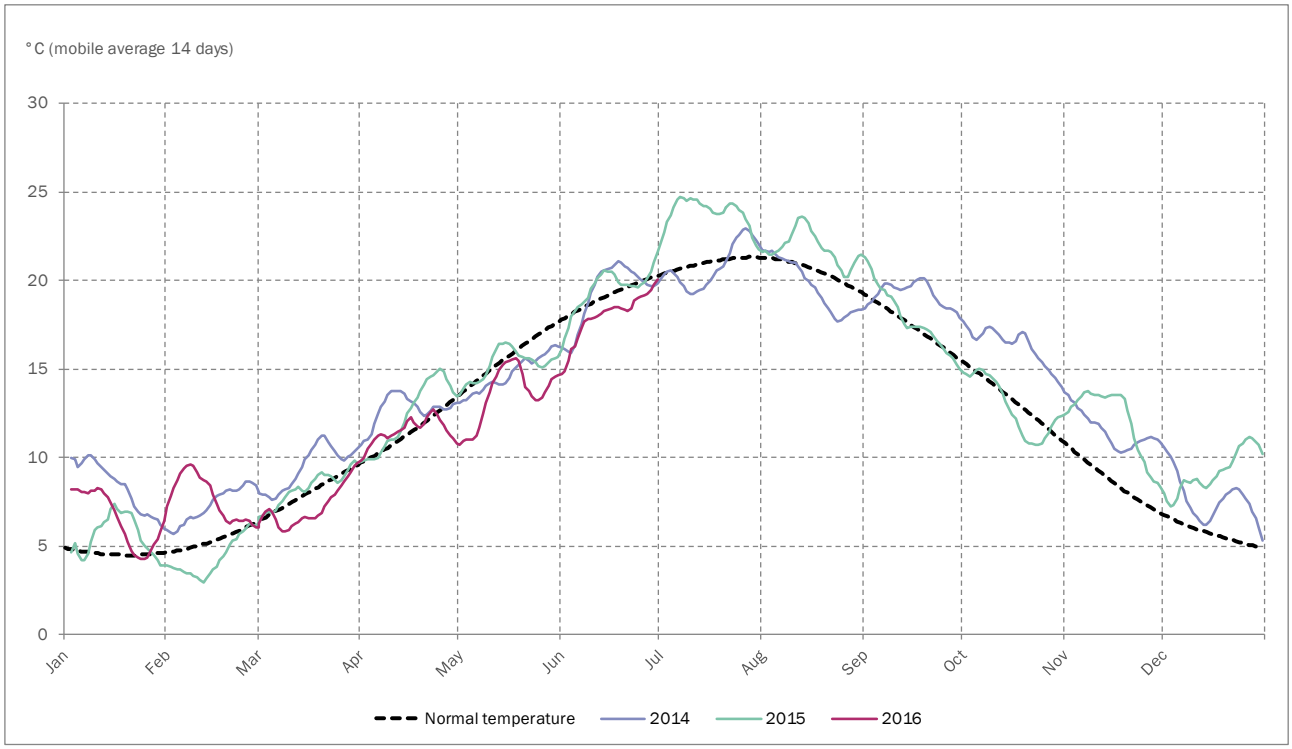
Temperatures were close to normal at the start of the year, with a positive difference of 0.4°C compared to normal temperatures between January and March, and an average positive difference of 0.68°C over the entire first quarter. Conversely, temperatures were warmer in the second half of 2015, with an average positive difference of 1.46°C compared to normal temperatures. The month of July was marked by two heat waves with temperature peaks and on some days positive differences of more than 7°C compared to reference temperatures.

In general, the year 2015, with the exception of the months of February, September and October, saw higher temperatures than normal.

Winter 2015-2016 was marked by very mild temperatures, with an average positive difference of 2.5°C compared to normal temperatures between the months of November 2015 and February 2016, which had a significant effect on gas and electricity demand. From the month of March 2016, temperatures drew closer to normal season temperatures, with an average difference lower than 0.1°C. For all of the first quarter of 2016, temperatures were an average 0.6°C below normal.

Despite several high-intensity rainy periods in the south of France between the month of August and October, rainfall in 2015 was on average more than 15 % lower than normal according to Météo France. In 2016, spring was marked by stormy weather with exceptional rainfall that caused flooding. This led to a return to hydroelectric power generation which had been at very low levels since the end of 2015.

Graph 5: Temperatures



Source: Reuters

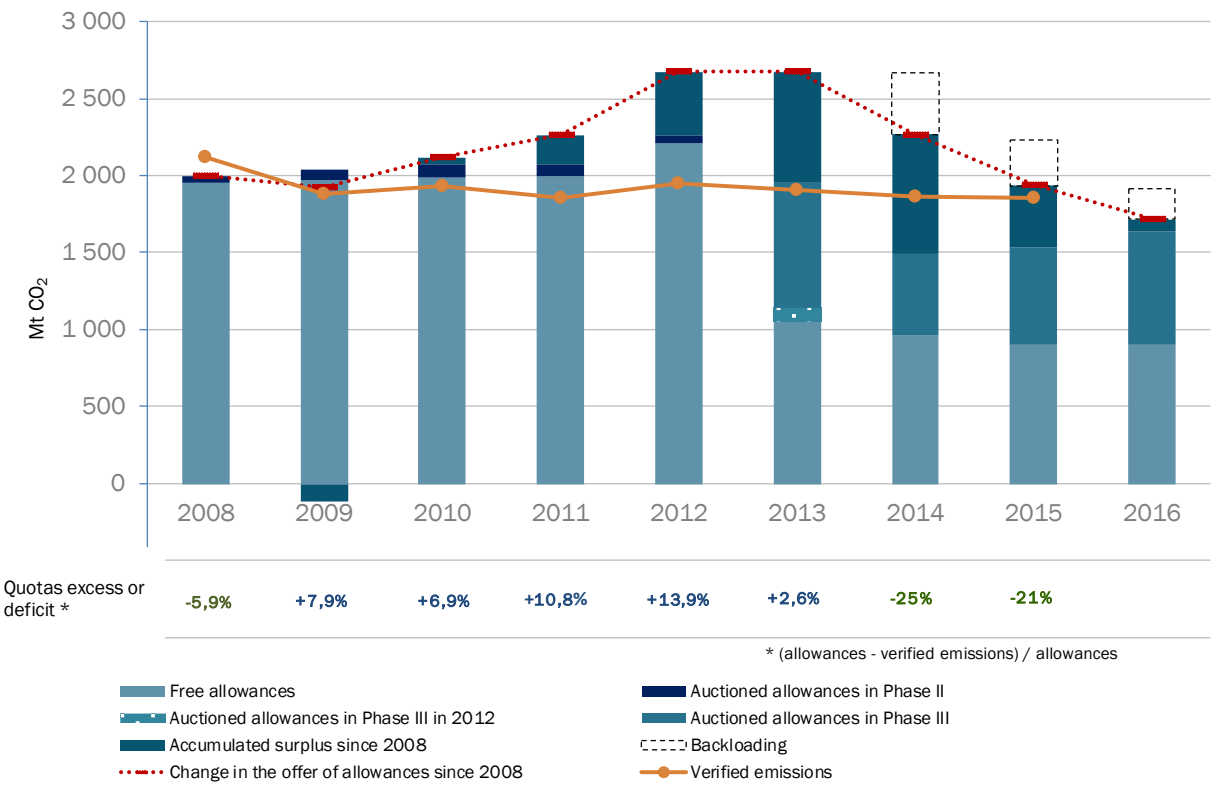
3. SHARP DROP IN THE PRICE OF EMISSION ALLOWANCES IN JANUARY AFTER AN INCREASE IN 2015

3.1 Reduction of the allowance surplus in 2015

In 2015, the number of emission allowances auctioned totalled 633 MT, i.e. roughly 100 more than in 2014. The backloading measure withheld 400 MT from auctioning in 2014, 300 MT in 2015 and should withhold 200 MT in 2016 (Graph 6) to be placed in the stability reserve. Consequently, in 2015 the number of allowances withheld was lower than in 2014, which explains the increase in the emissions auctioned in 2015.

A deficit of 321 MT was observed between the allowances distributed and verified emissions in 2015 and therefore enabled the existing surplus to be reduced. The emissions surplus accumulated since 2008 is only 81 MT in 2016 (compared to 402 MT in 2015).

Graph 6: Accumulation of surplus CO_2 allowances since 2008



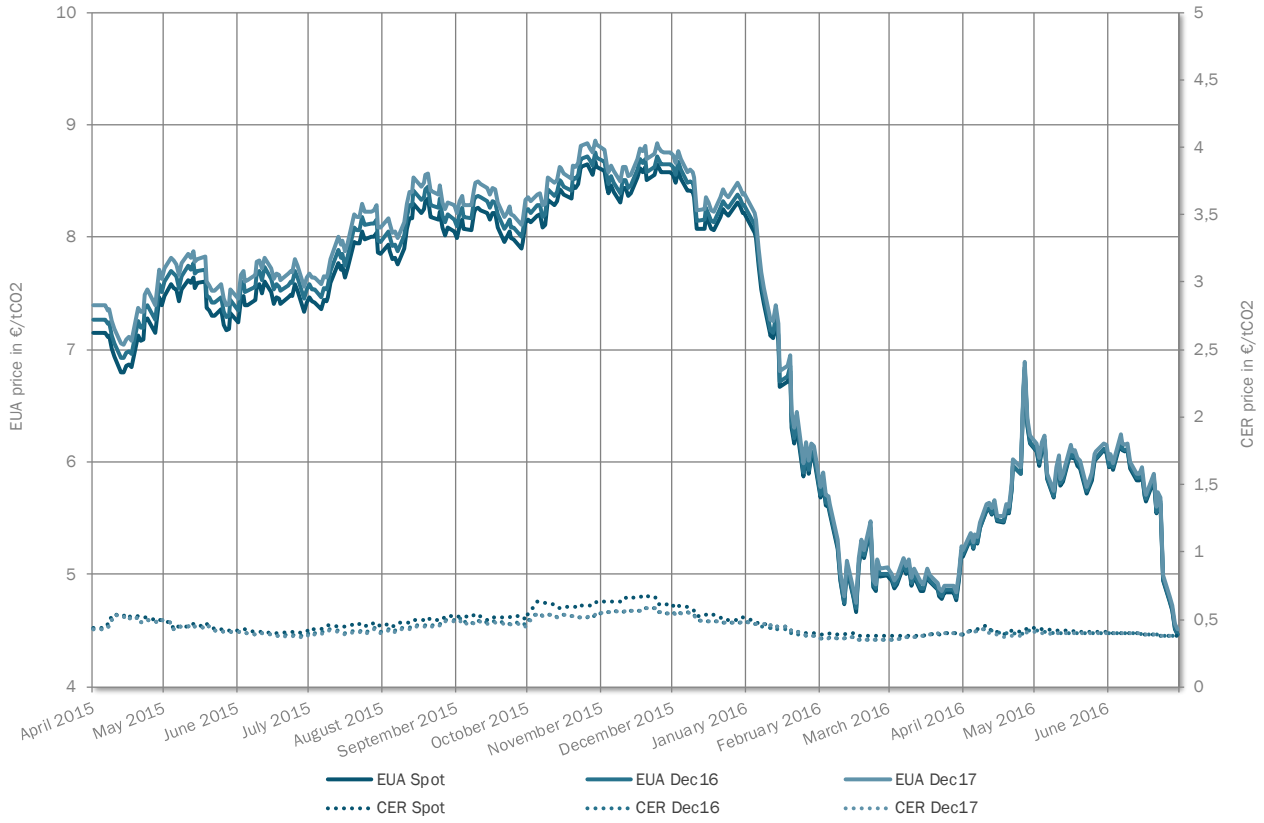
Source: CITL, European Commission– Analysis: CRE (assumptions for 2016: free allocations identical to 2015; 100 MT of additional allowances compared to 2015 taking into account backloading of 200 Mt instead of 300 MT in 2015)

3.2 Decline in CO_2 prices since early 2016

Contrary to other raw materials, the price of the CO_2 allowance increased in 2015 (+17 %) against European market reforms and the reduction of excess supply. This trend however came to a stop at the end of the year and the price of CO_2 fell sharply in January (-30 %) to level off at around €5/t in the first quarter (Graph 7). This movement may be due to sales made by electricity producers in Europe as they held excess allowances.

As from 31 March 2016, the allowance price went back to €6/t following the announcement by the Minister of the Economy, Industry and Digital Sector during the general assembly of the union of energy users (UNIDEN) of an intention to implement a floor price for carbon. It increased rather sharply on 26 April, the day after the announcement by the French President of the project to establish a floor price for the CO_2 allowance for electricity production in France (Graph 7 and Box Implementation of a floor price for CO_2 in France). It finally went below €5/t after the announcement of the results of the British Brexit referendum on 24 June.

Graph 7: Evolution of the price of the CO_2 allowance



Source: ECX – Analysis: CRE

Implementation of a floor price for CO_2 in France

At the environment conference of 25 April 2016, the French President announced the implementation of a floor price for CO_2, unilaterally as from 2017, for thermal power generation in France. The Minister of the Ecology, Development and Energy indicated that the price envisaged could range from €25 to €30/tonne. The announcements may have had an impact on the price of CO_2 allowances at European level and on futures wholesale prices in France. Some wholesale energy market participants expressed concerns over such a mechanism, in particular with regard to its impact on combined-cycle gas plants whose profitability and positioning in the plant merit order at European level would be adversely affected. Concerns were also raised by producers of fossil-fired power in terms of security of supply.

A report was published in July within the framework of the mission led by the Canfin, Grandjean and Mestrallet Commission on the proposals for carbon prices aligned with the Paris agreement. On the occasion of the delivery of this report, the Minister of the Environment and Energy, in charge of climate negotiations, specified on 11 July 2016 that the measure envisaged would concern only coal plants.

Given the potential effects of this measure on the functioning of markets, CRE recommends that the impact assessment of this measure should analyse:

- the effects on wholesale electricity prices in France and on border exchanges;
- the resulting carbon footprint since the expected rise in French wholesale electricity prices could lead to high-carbon electricity imports from bordering countries depending on the time of the year.
- the micro-economic effects for the plants concerned and the macro-economic effects in terms of supply security;
- and lastly, the link with the European framework, in particular the European Union Emissions Trading System or, with other similar national measures.

SECTION 3
WHOLESALE ELECTRICITY MARKETS

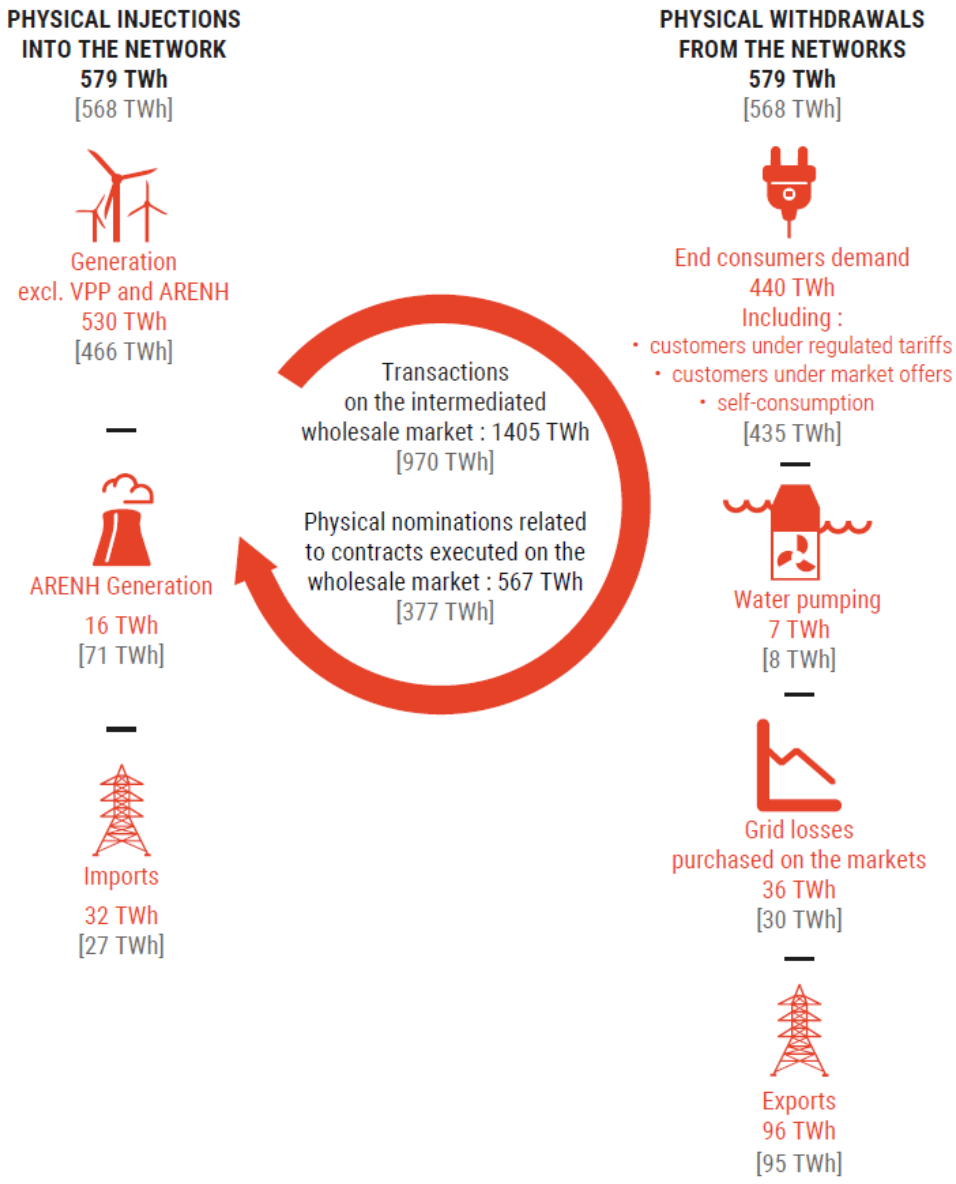
1. FUNDAMENTALS OF THE WHOLESALE ELECTRICITY MARKET: A SUPPLY/DEMAND BALANCE WITHOUT ANY SPECIFIC TIGHTNESS IN 2015

The year 2015 was marked by a slight pickup in electricity consumption compared to 2014, though the level remained low, in particular because of weather conditions. Demand was met under these conditions with no specific periods of tightness. Nuclear availability was stable, with the exception of the month of September 2015, which was marked by a high unavailability of plants. Hydroelectric generation was affected in the second half by a low level of runoff, but the other renewable energy sources continued their boom and henceforth account for 14 % of installed power. Lastly, gas plant generation increased. Price conditions in the wholesale markets heavily reduced the attractiveness of the ARENH product.

1.1 Slight recovery in consumption and decline in ARENH subscriptions

Graph 8 presents a simplified version of the main flows for 2015 in the French electricity system and compares them to the figures for 2014 (between brackets).

Graph 8: Injections and withdrawals for 2015 [2014]



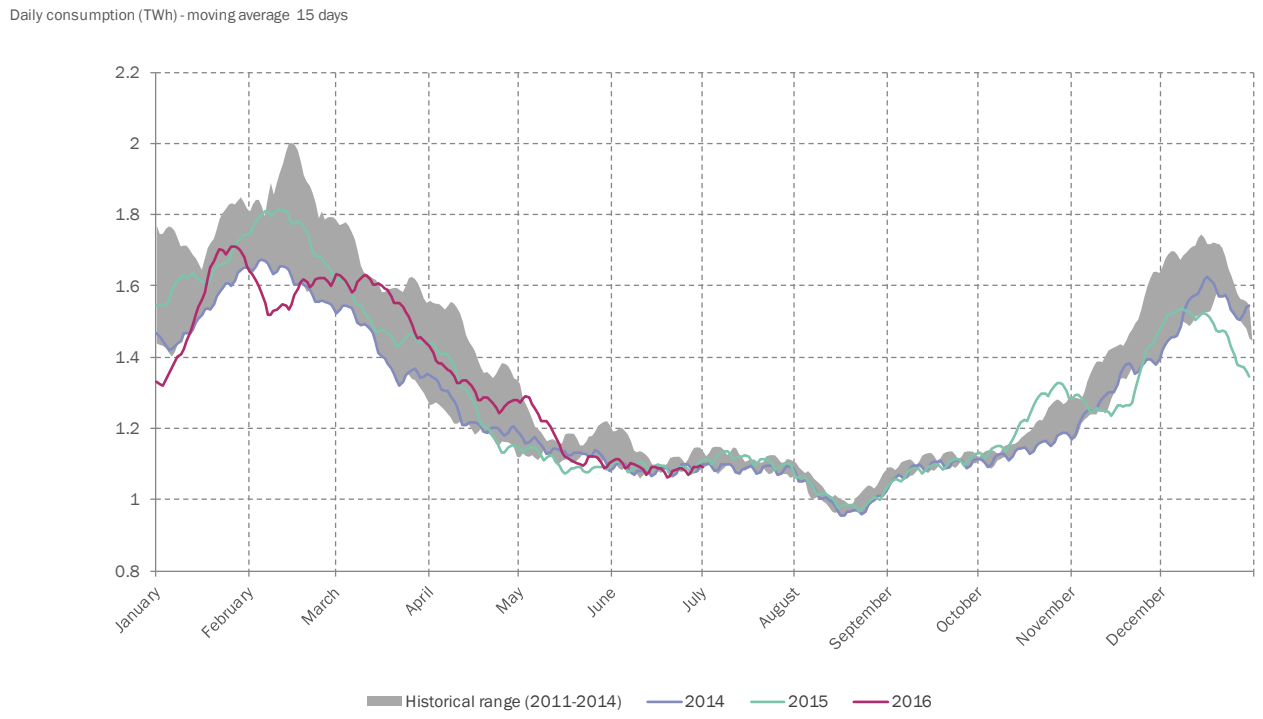
Total consumption picked up in 2015 compared to the low 2014 levels, increasing from 435 TWh in 2014 to 440 TWh in 2015, i.e. a +1.1 % increase (Graph 9). Household and business consumption increased by 3.6 %, going from 195 TWh to 202 TWh. Large industry and SME/SMI consumption increased by 1.2 %, from 235 TWh to 238 TWh[31].

The consumption increase is mainly related to a winter, an early spring and a month of October that were colder than in 2014, though temperatures were generally warmer than usual. Heat events in the month of July had only a limited overall impact on consumption (+2 % compared to July 2014). However, 2015 remained a year of relatively low consumption (roughly -4 % compared to 2012 and 2013).

In the first half of 2016, the month of February was marked by low consumption due to higher temperatures than normal (+2 °C).

As regards physical injections into the grid, electricity deliveries related to the Virtual Power Plant[32] (VPP) mechanism are now nil. No product offered during the last auctions in 2012 concerned deliveries beyond 2015. In addition, there was a sharp drop in ARENH subscriptions for delivery in 2015 (-77 %). Alternative suppliers arbitrate between market products and the ARENH product, which has been less competitive since calendar prices dropped below €42/MWh at the end of 2014. Five participants cancelled their ARENH rights in 2015, before the 1 July gate. For 2016, there are no ARENH subscriptions. However, renewed interest in the mechanism in the medium term should not be dismissed if calendar prices again draw close to €42/MWh and in particular if the capacity market is effectively set up[33].

Graph 9: Consumption in France



Source: RTE – Analysis: CRE

[31] Source: RTE (http://www.rte-france.com/fr/article/statistiques-de-l-energie-electrique-en-france)

[32] Mechanism set up in 2001 following the European Commission's request in order to "eliminate the strengthening of EDF's dominant position on the market for eligible customers in France": EDF was offering to alternative participants – through an auction mechanism – production capacity with withdrawal rights.

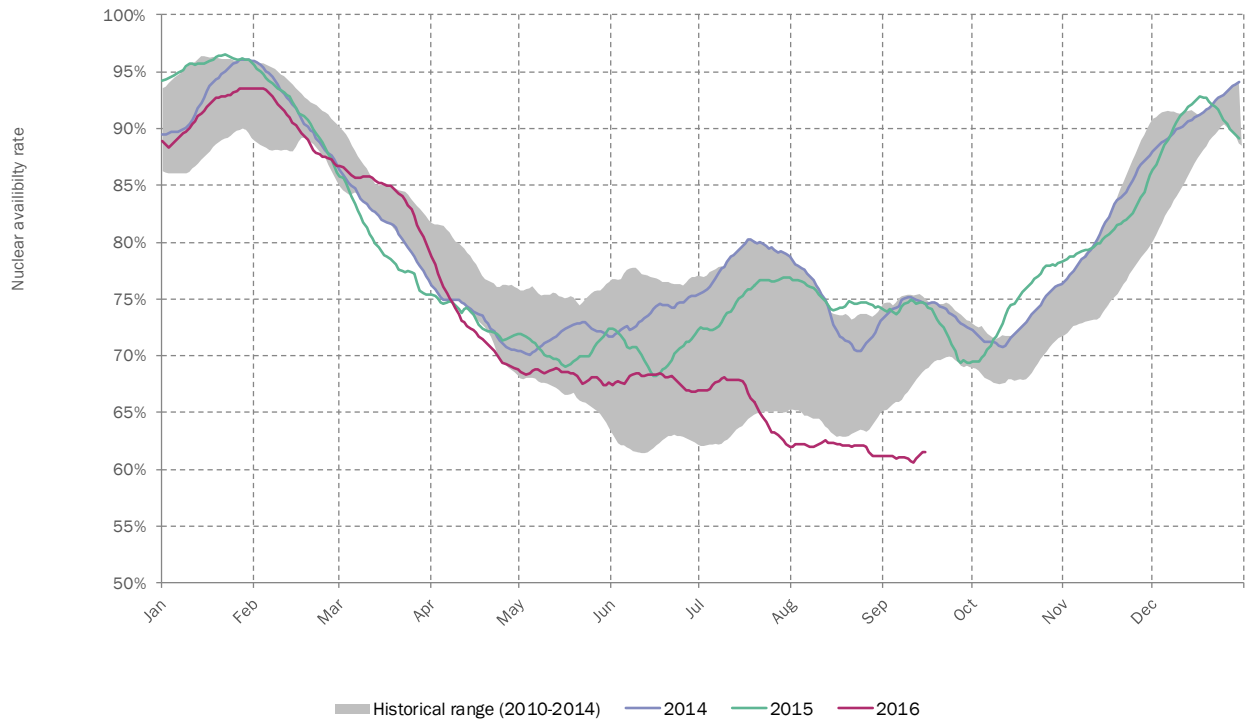
[33] The ARENH product corresponds to baseload energy delivered over the year, but also to guaranteed capacity. Arbitration is between, on the one hand, the sum of calendar product prices and capacity prices, an on the other hand the ARENH price.

1.2 Stable nuclear availability and decline in hydroelectric power generation in the second half of 2015

The year 2015 was marked by good nuclear availability (79 %), which is comparable to that of the year 2014 (Graph 10). However, some months were marked by high unavailability levels, particularly September 2015. Since the month of July 2016, effective unavailability of nuclear production facilities increased and information concerning extensions of nuclear unit outages was made public[34]. The rate of availability recorded during summer is particularly low and explains the movements recently seen in electricity forward prices (See Chapter 2.2).

With regard to hydroelectric power generation, contrary to 2014, the year 2015 was marked by low rainfall (-15 % compared to normal), which led to a drop in production, particularly in the second half of 2015. Hydroelectric power generation levels dropped sharply in July and bottomed out in August 2015, as well as at the end of the year (Graph 11). Early 2016 followed on from the end of 2015, with low production (use rate 10 points lower than the lowest level in the 2010-2014 curve) and low stock levels (-25 % compared to early 2015). The rise in run-of-river hydroelectric power generation leading to the increased use rate of the hydraulic sector recorded in January is due to heavy rainfall. Low consumption levels in February led to a drop in production from dams. Exceptional rainfall in spring 2016 led to a major increase in run-of- river generation and increased stock levels.

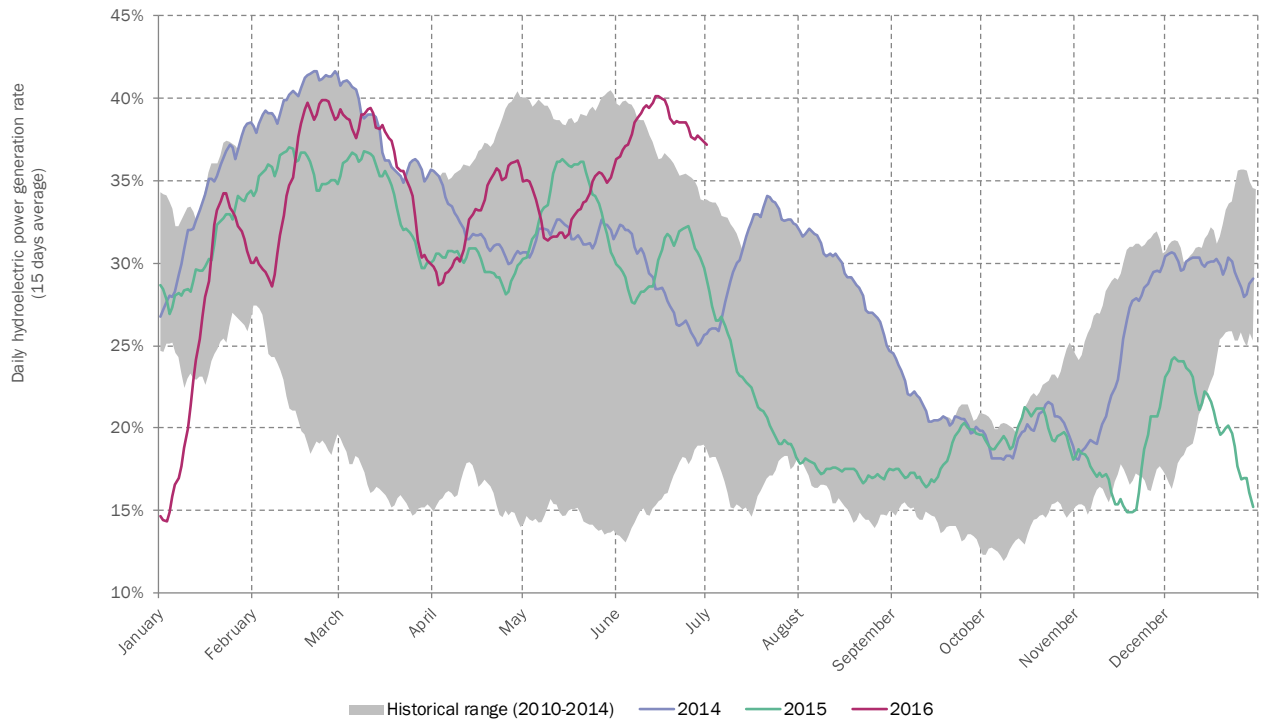
Graph 10: Availability rate of French nuclear power stations



Source: RTE – Analysis: CRE

[34] See in particular the press release by the French nuclear authority (ASN) on 23 June 2016

Graph 11: Rate of hydroelectric power generation



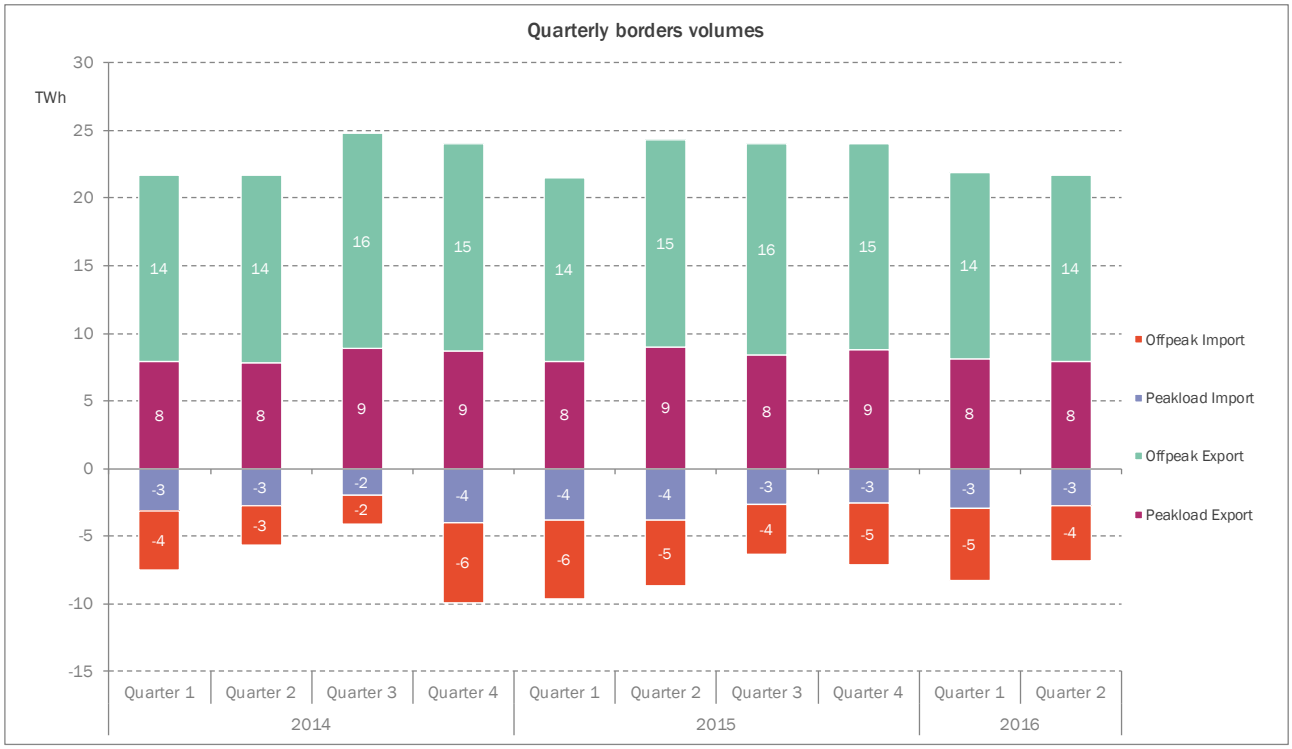
Source: RTE – Analysis: CRE

The relatively low consumption level of the year 2015, combined with good nuclear availability (79 % on average for the year) once more enabled a high export level with a net export balance of 63 TWh (65.1 TWh in 2014 and 47 TWh in 2013) (Graph 12).

The net export balance of winter 2014/2015 was down compared to that of winter 2013/2014, in particular because of the higher consumption and the equivalent nuclear availability rate. In summer, the net export balance remained high in 2015 though lower than in 2014, despite the major drop in hydroelectric generation (Graph 12). Autumn 2015 was marked by a considerable increase in the net export balance, due in particular to the growth of exports to Spain following the commissioning of the new interconnection line on 5 October 2015. This new line has brought average commercial capacity to roughly 2 GW, i.e. an additional 1 GW[35] (Graph 13 and Graph 14). The increase in net export balance during this period is also due to mild weather conditions (in November and December), which led to a drop in consumption and therefore favoured exports, particularly to Switzerland which has two unavailable nuclear units.

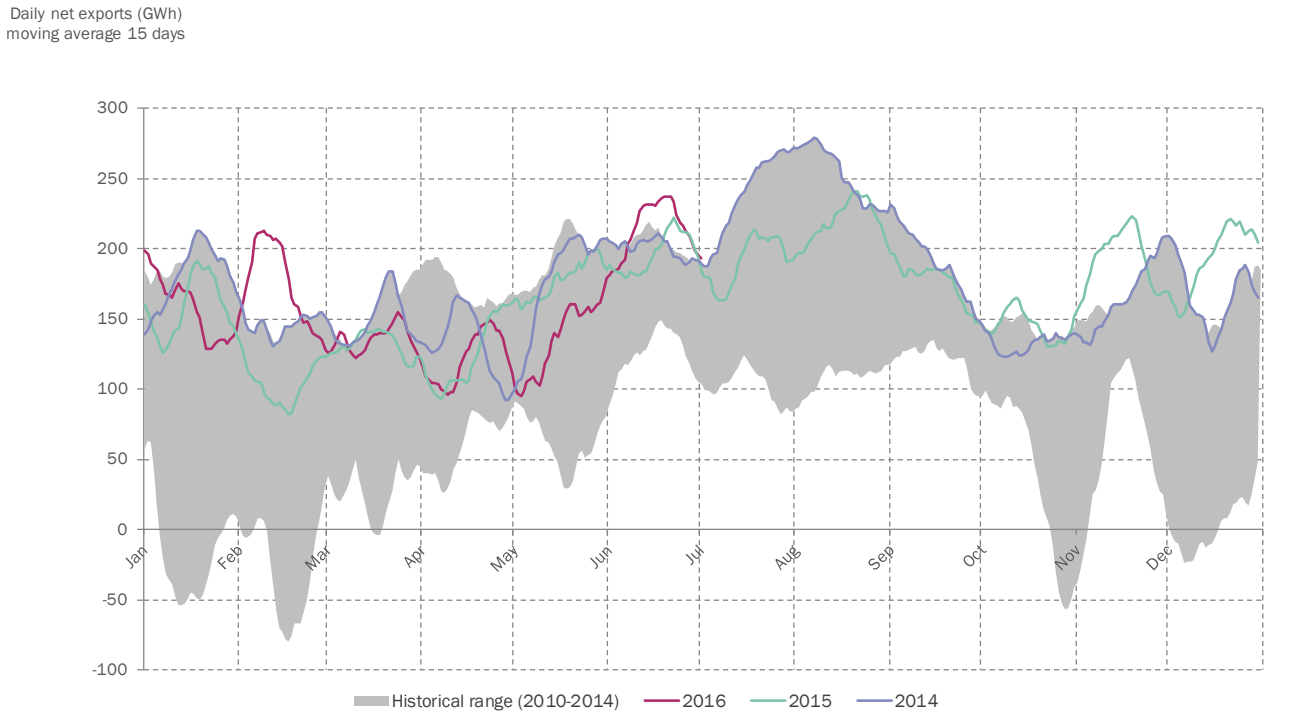
[35] Once the network is strengthened on the Spanish side, the interconnection's commercial capacity should reach 2.8 GW in both directions.

Graph 12: Quarterly volumes traded at borders



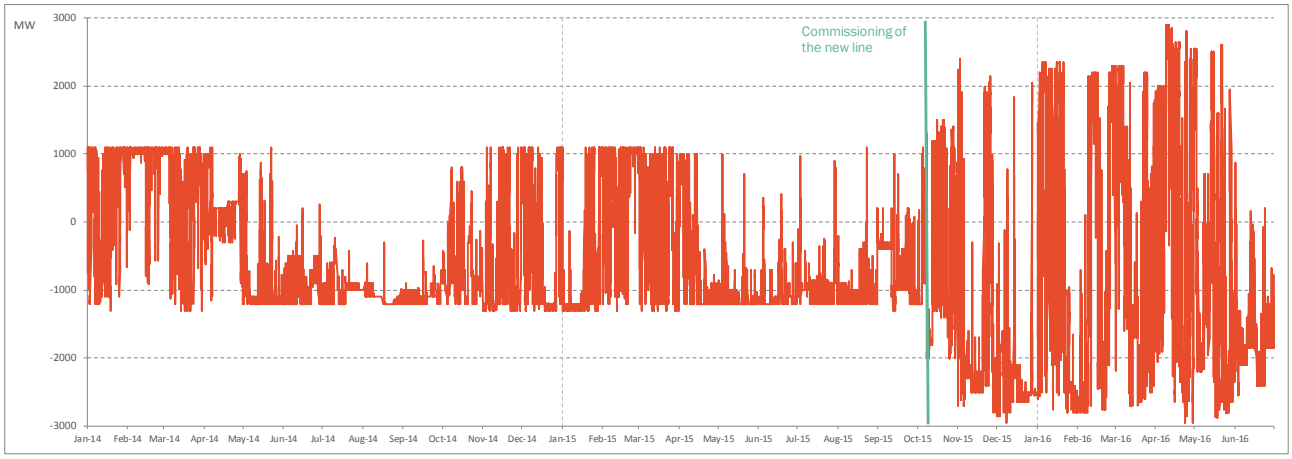
Source: RTE – Analysis: CRE

Graph 13: Export balance



Source: RTE – Analysis: CRE

Graph 14: Trade with Spain (exports = negative values)



Source: RTE – Analysis: CRE

1.3 Continuing boom in renewable energy (excluding hydroelectric) which now represents 14 % of installed power

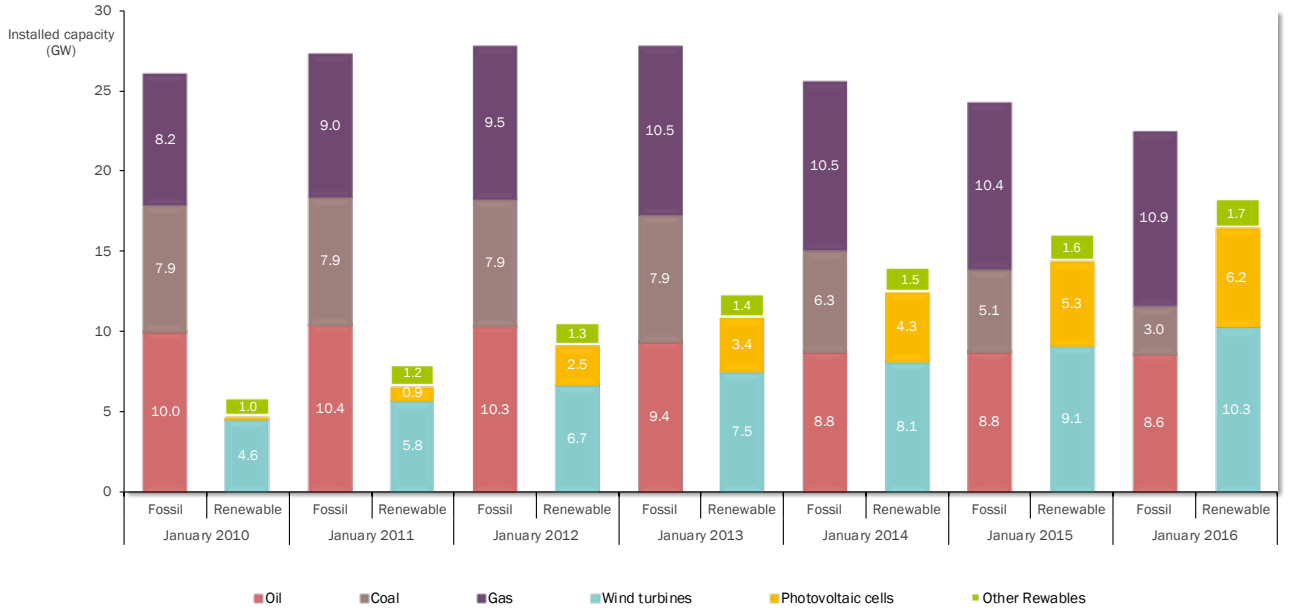
Installed capacity from renewable energy sectors has grown continuously for several years (Table 13). Between 1 January 2015 and 1 January 2016, this capacity increased by 2.2 GW, i.e. +14 %. The capacity of coal-based generating facilities declined: -2.1 GW in 2015, i.e. a 40 % drop (–1.6 GW in 2013 and -1.2 GW in 2014) (Graph 15).

Table 13: Evolution of installed capacity from renewable sectors

	2012	2013	2014	2015	AAGR 2012/2016
Wind	+12 %	+8 %	+12 %	+13 %	+11 %
Solar	+36 %	+27 %	+22 %	+17 %	+25 %

Source: RTE – Analysis: CRE

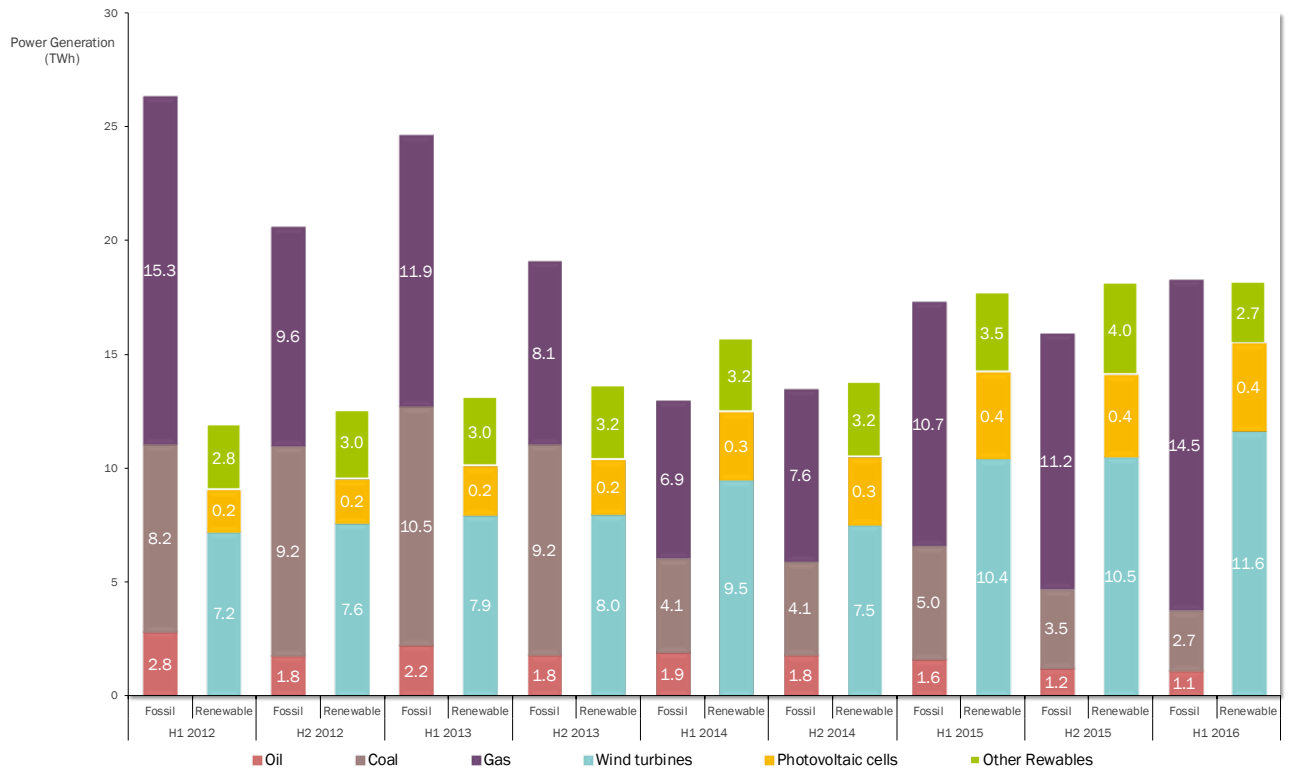
Graph 15: Comparison of installed capacity from the thermal fossil (excluding nuclear) and renewable energy sectors (excluding hydroelectric power)



Source: RTE – Analysis: CRE

For the second consecutive year, renewable sector generation (excluding hydraulic) has exceeded generation from the fossil thermal sector (excluding nuclear), despite increased generation from the latter (+7 TWh) related to growth in gas-fired power generation (see Section II, chapter 1.4). Renewable generation reached 35.8 TWh (+6.4 TWh compared to 2014) compared to 33.2 TWh for the fossil thermal sectors (Graph 16).

Graph 16: Comparison of six-month production of the thermal fossil (excluding nuclear) and renewable energy sectors (excluding hydraulic)



Source: RTE – Analysis: CRE

1.4 Increase in gas-fired generation, promoted by low fuel prices

In 2015, gas-fired production increased sharply compared to 2014 (Table 2): it went from 14 TWh to 22 TWh (+60 %). The average increase is +0.7 GW for off-peak times and +1.3 GW for peak times. Gas plants therefore became more often profitable at peak times, and there were also profitable off-peak times as well (Graph 17).

The highest part of this increase was recorded during the winter months (January to March and October to December). Gas plants were used a lot more often because of the consumption increase in the first quarter of 2015 and against the low gas prices, despite a drop in the export balance. In addition, there was also a slight increase in gas-fired generation in July 2015, which is connected to the drop in nuclear availability and run-of-river generation, continuity of exports, and heat peaks.

The increase recorded in the fourth quarter of 2015 corresponds, on the one hand, to a slight drop in unavoidable energy production, but especially to a net increase in exports resulting from the effects of low gas prices, the commissioning of the new interconnection line with Spain, and the unavailability of two Swiss nuclear units.

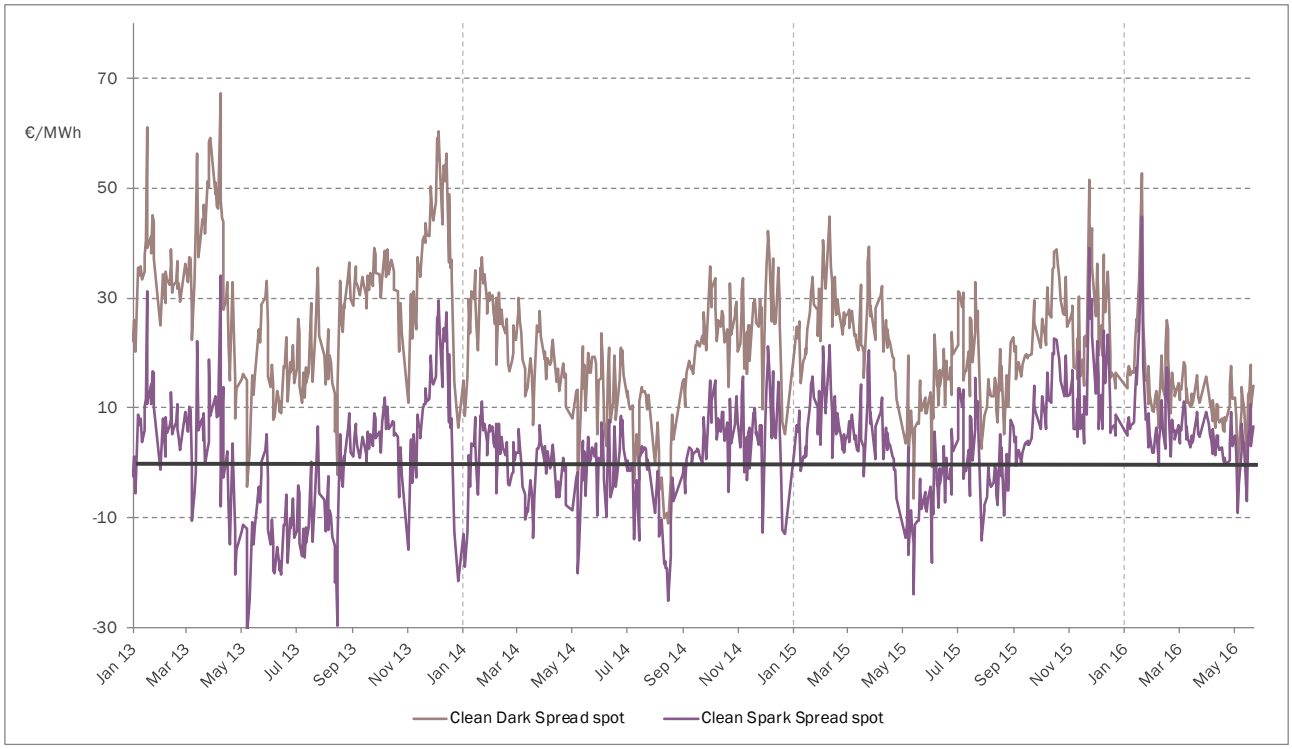
In addition, based on the clean dark spread indicator[36] (Graph 17), coal plants were profitable for a major part of the year 2015, as a result of the low coal prices. Electricity generation from these plants stayed at the same level as in 2014 despite the shutdown of 2.1 GW. This resulted in an increase in the daily use rate of the sector (Graph 19).

[36] The clean dark and spark spreads are indicative calculations, which do not take into account all plant costs, in particular fixed costs and start-up costs, and are therefore not the only indicators for a decision to start a unit.

CSS (€/MWh) = $p_E - (\alpha p_C + \beta p_{CO2})$, where p_E is the day-ahead peak electricity price in France, p_C is the price of coal, p_{CO2} the spot price of CO_2, α the average yield of a coal plant (35 %) and β the emission factor of coal plants (0.96 tCO_2/MWh). Calculations were done assuming a coal calorific value of 8.14 MWh/t.

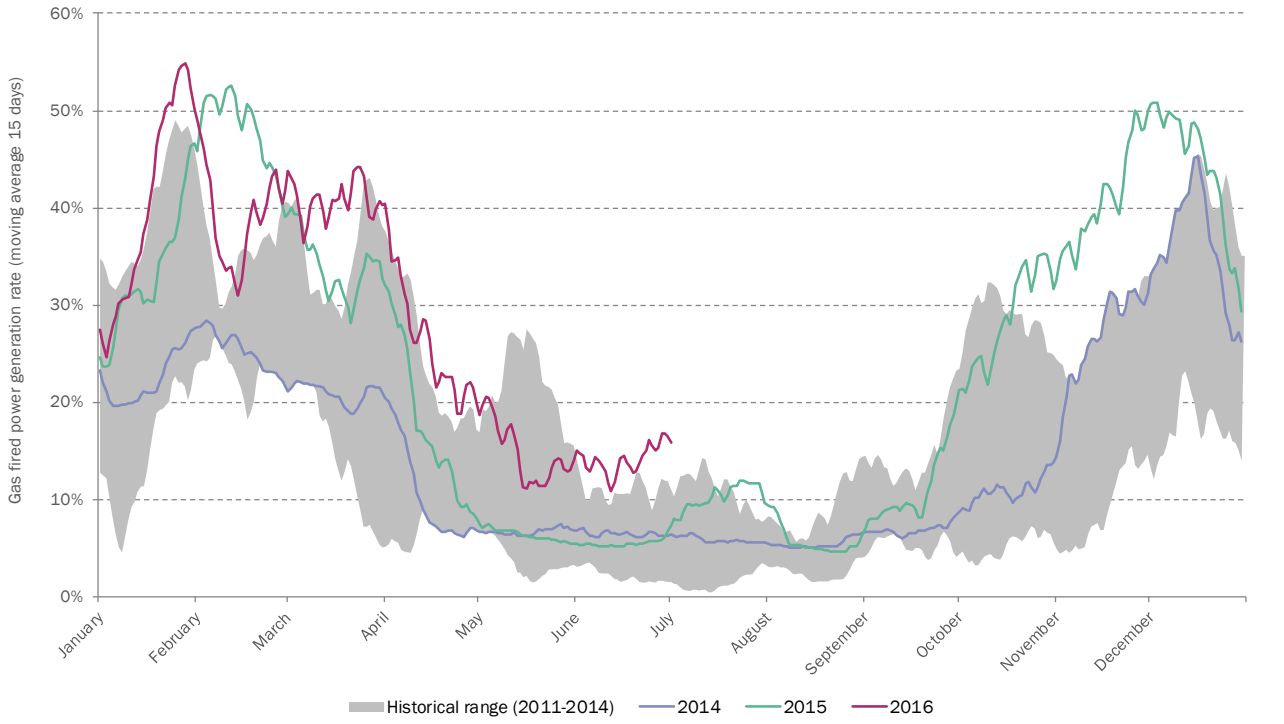
CSS (€/MWh) = $p_E - (\gamma p_G + \delta p_{CO2})$, where p_E is the day-ahead peak electricity price in France, p_G is the price of gas, p_{CO2} the spot price of CO_2, γ the average yield of a gas plant (52 %) and δ the emission factor of gas plants (0,43 tCO2/MWh)

Graph 17: Peak spot clean dark spread and peak spot clean spark spread



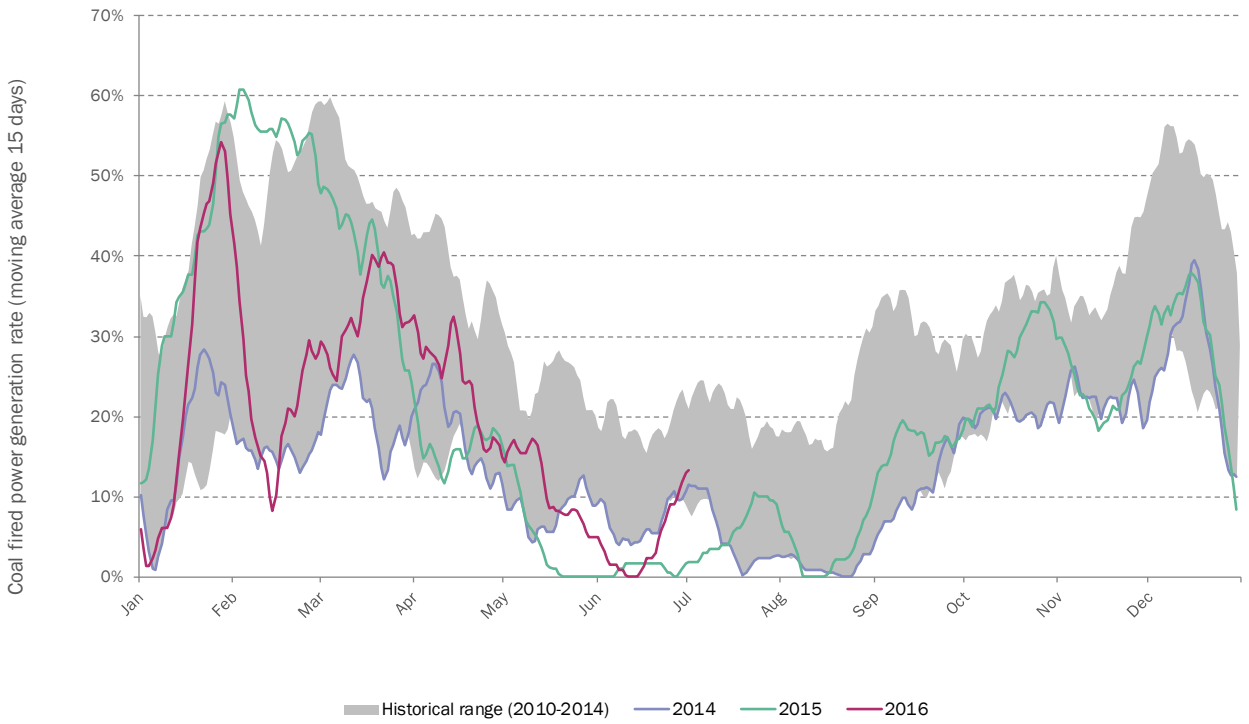
Source: ECX, Heren, Powernext, EPEX Spot - Analysis: CRE

Graph 18: Rate of gas-fired power generation



Source: RTE – Analysis: CRE

Graph 19: Rate of coal-fired power generation



Source: RTE – Analysis: CRE

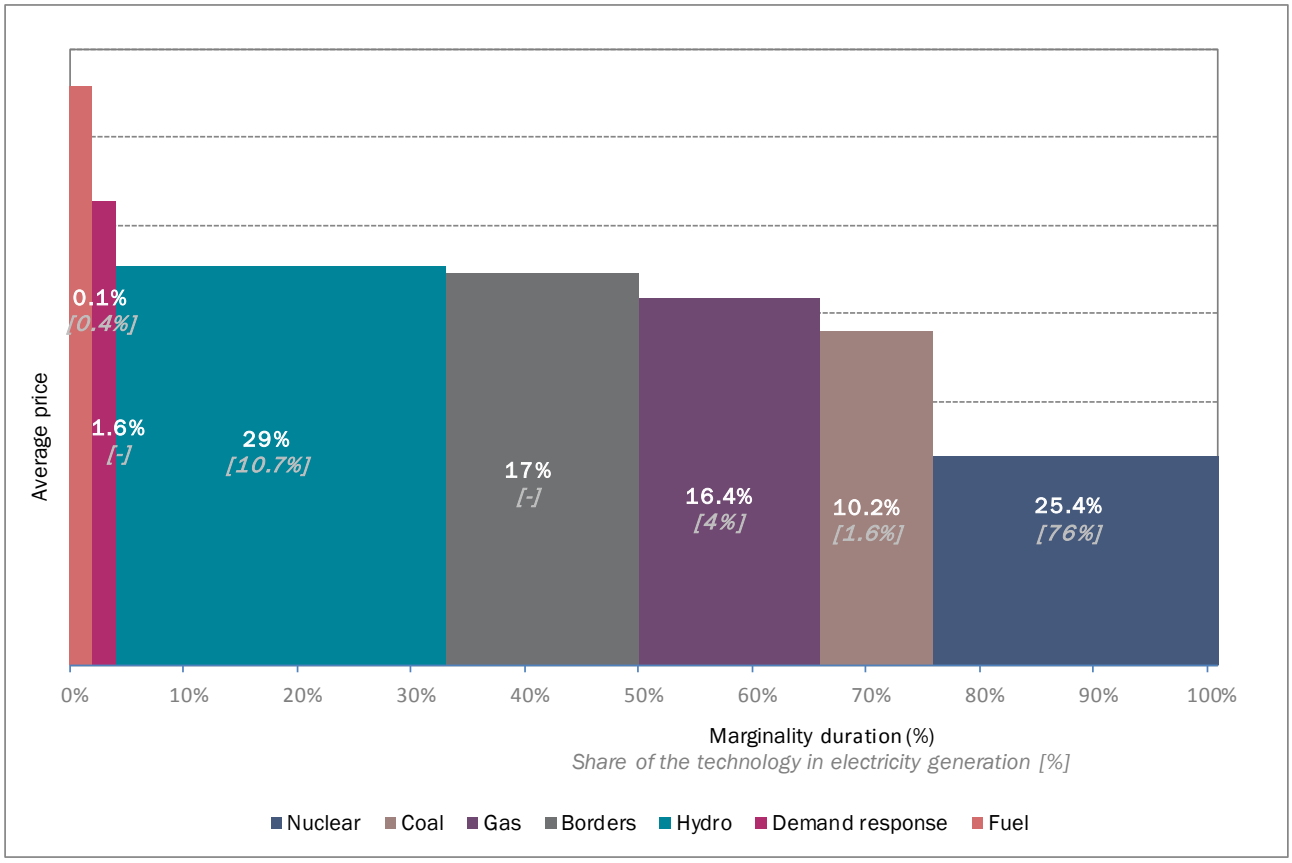
1.5 The gas sector more present in 2015 with its marginal price more frequently determining market price

A generation sector is said to be "marginal" when its marginal cost determines the market price, i.e. when the cost of a plant in this sector is close to EPEX SPOT's day-ahead auction market price. It can then be considered that it is the last unit used to meet demand and that its cost is decisive in the formation of the market price.

Methodological improvements to the calculation of marginality have been made since the previous surveillance report, with the inclusion in the calculation of "bloc" type offers in the day-ahead market.

Marginality of the different generation sectors in 2015 corroborates fundamental analysis, with the nuclear sector marginal one-fourth of the year and increased marginality of the gas sector, in line with the greater profitability recorded in 2015.

Graph 20: Marginality of the different generation sectors in 2015



Sources: EPEX SPOT, RTE, Producers

1.6 Overvaluation of D-7 nuclear availability compared to actual availability for 3.8 % of existing facilities in 2015

As for previous years, forecast availability anticipated one to several days beforehand compared to actual availability is always overestimated by electricity producers. This is due to the type of contingencies generally affecting production units, in particular unplanned outages and delays in maintenance. The main uncertainty concerned nuclear availability which was overvaluated at D-7 by 2.4 GW, up slightly from 2014 (+200 MW). This represents 3.8 % of the installed nuclear base. Uncertainty surrounding coal availability dropped on the other hand, going from 532 MW in 2014 to 413 MW in 2015, i.e. 8.6 % of the installed base.

Since December 2014, RTE harmonised the data it publishes with those required by the transparency regulation EC 543/2013[37] of the Commission of 14 June 2013 on submission and publication of data in electricity markets. Forecast availability must be recalculated based on planned and unplanned unavailability published, so that the publishing of this indicator may continue to be consistent with previous years.

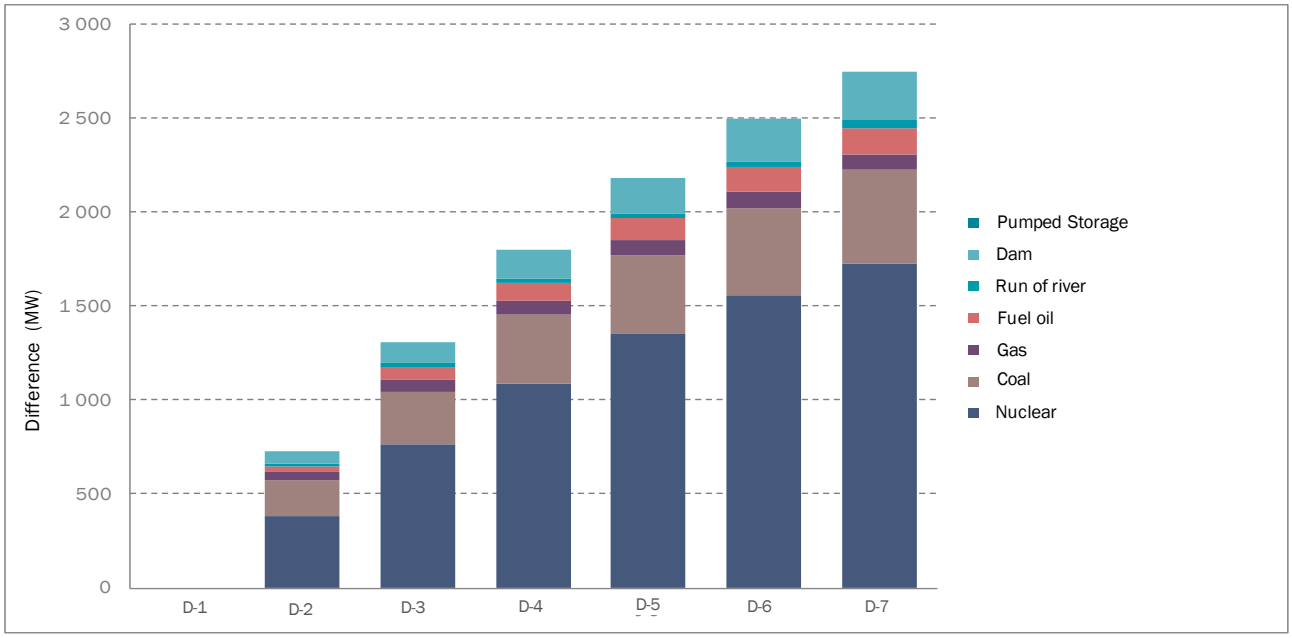
[37] http://eur-lex.europa.eu/legal-content/fr/TXT/PDF/?uri=CELEX:32013R0543&rid=10

Table 14: Forecast availability of the different generation sectors in 2015

Sector	Nuclear	Coal	Gas	Fuel oil	Hydraulic run-of-the-river/dam	Hydraulic lakes	Total
Average difference 1 day ahead (MW)	669	100	57	57	-11	-6	866
Average difference 3 days ahead (MW)	1610	295	111	173	0	8	2197
Average difference 7 days ahead (MW)	2412	413	171	313	4	29	3342
Average difference 7 days ahead (% of the base)	3.8 %	8.6 %	2.9 %	4.6 %	0.0 %	0.4 %	3.2 %
Average difference 7 days ahead in 2014 (% of the base)	3.5 %	11.1 %	1.5 %	2.7 %	0.5 %	4.5 %	3.3 %

Source: RTE – Analysis: CRE

Graph 21: Average difference between availability forecasts and D-1 forecast



Source: RTE – Analysis: CRE

2. WHOLESALE PRICES LOW IN 2015

Wholesale electricity prices remained low in 2015, but with different trends for spot prices and forward prices. Forward prices, at an average €38.5/MWh in 2015 remained low but were up compared to the previous year, particularly during the second half because of low hydroelectric power generation (see above). Forward prices however, dropped continuously throughout 2015 and only started to recover in the first half of 2016. This trend was in line with that recorded for the main raw materials.

The recent pickup in forward prices now places calendar products at about €40/MWh, and if they rise again, they may rekindle interest in the ARENH product.

2.1 Spot prices up in 2015 due to low runoff

2.1.1 Spot prices at €38.6/MWh in 2015

Due to a colder winter and spring in 2015 compared to 2014, and summer marked by major heat events, consumption grew +1.8 % compared to 2014. Because of the reduced hydroelectric power generation, short-term prices increased, though they remained at low levels: the average day-ahead baseload power price was €38.6/MWh, up 11.2 %, i.e. a €3.9/MWh increase compared to the year 2014 (Table 15 and Graph 22). This price increase was also seen for the peakload day-ahead price, with an average price of €46.6 per megawatt-hour compared to €43.8 in 2014, i.e. a smaller increase than for baseload prices at 6.4 %. The average intraday price in the EPEX SPOT market in 2015 followed the same trend as spot prices, standing at €38.8/MWh, i.e. a €3.8/MWh increase compared to 2014.

During the first half of 2016, there was a notable price correction of the 2015 movement. The very mild temperatures at the start of 2016 reduced consumption in France and lowered spot prices over that period. The greatest difference was recorded in February when spot prices were an average €24.6/MWh less expensive than prices recorded at the end of February 2015. For the first half of 2016, the average baseload price was €27.30/MWh compared to €38.9/MWh in the first half of 2015, i.e. a significant 29.8 % drop.

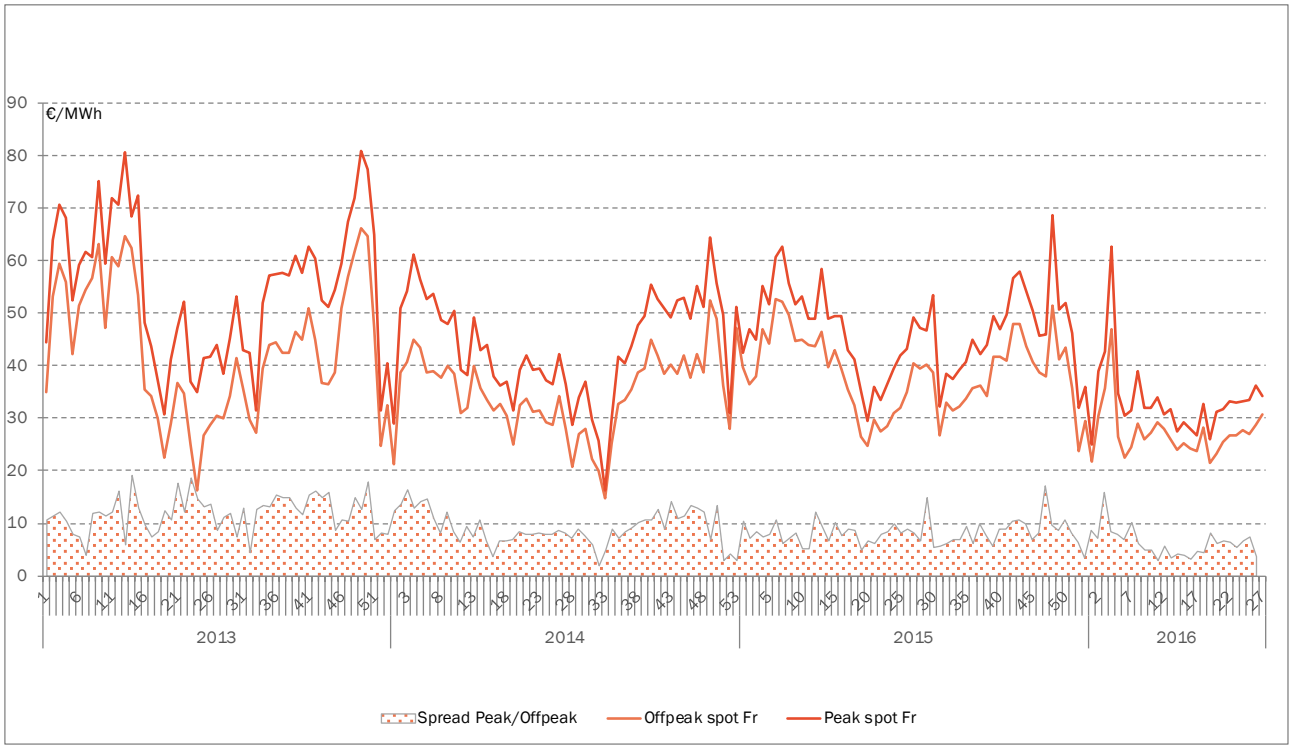
In the first half of 2016, the average intraday price was €27.7/MWh, i.e. a drop by €11.8/MWh compared to the first half of 2015, which is comparable to the drop recorded for day-ahead prices.

Table 15: Average day-ahead and intraday prices

Period	Average day-ahead price	Average intraday price
2014	€34.7/MWh	€35.1/MWh
2015	€38.6/MWh	€38.8/MWh
HY1 2015	€38.9/MWh	€39.6/MWh
HY1 2016	€27.3/MWh	€27.7/MWh

Source: EPEX SPOT

Graph 22: Evolution of day-ahead prices in France (average weekly price)



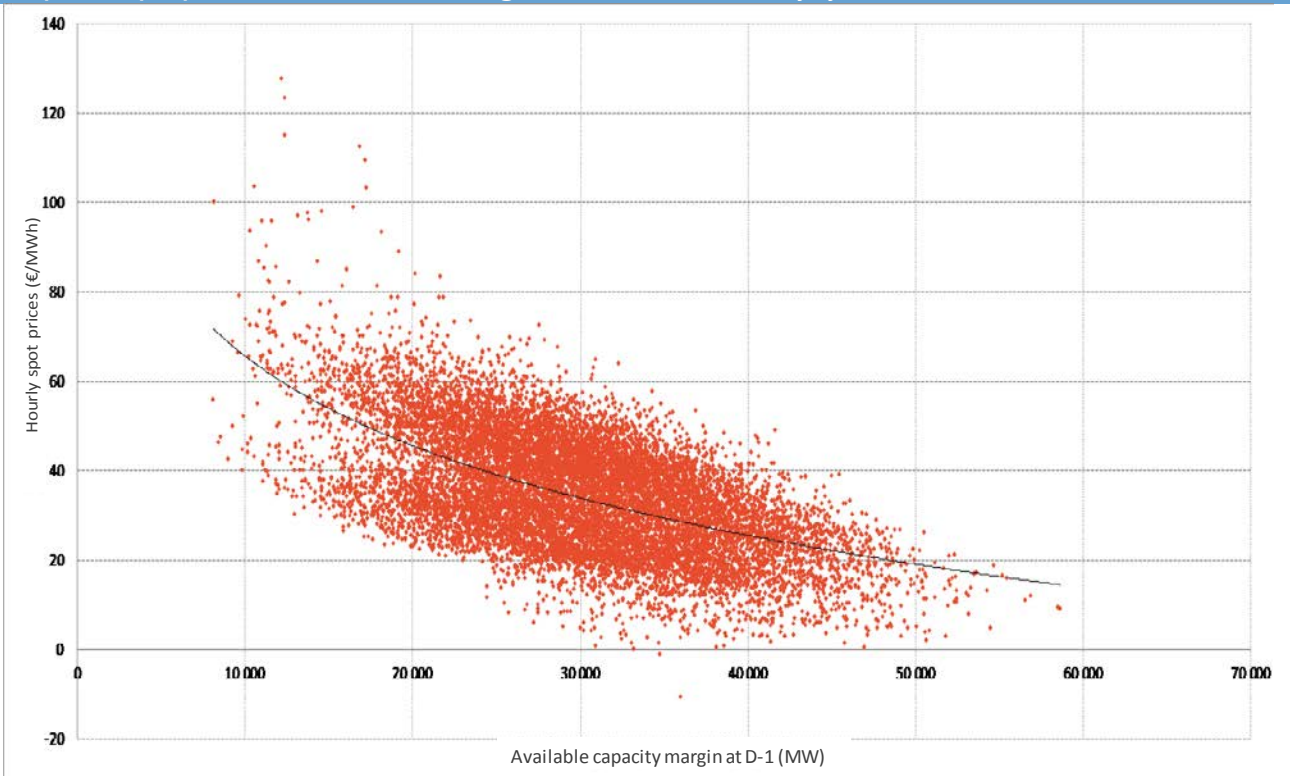
Source: EPEX SPOT

No price spikes were to be noted in 2015 in the day-ahead market due to the absence of supply/demand tightness and comfortable margins in the French electricity system. In 2015, these margins[38] were an average 30.7 GW, up slightly compared to 2014 (+1.2 GW) because of better availability of thermal generation facilities. Comparing spot prices with the margins observed hour by hour helps to check the overall consistency of prices with fundamentals (Graph 23).

This absence of a price spikes fell within the context of low volatility of the French market. Volatility of spot market prices remained below 15 % in France and Germany, as in 2014 (Graph 24). Only the Belgian market saw price peaks on 22 September and 16 October 2015, which explains the volatility increase as from these dates.

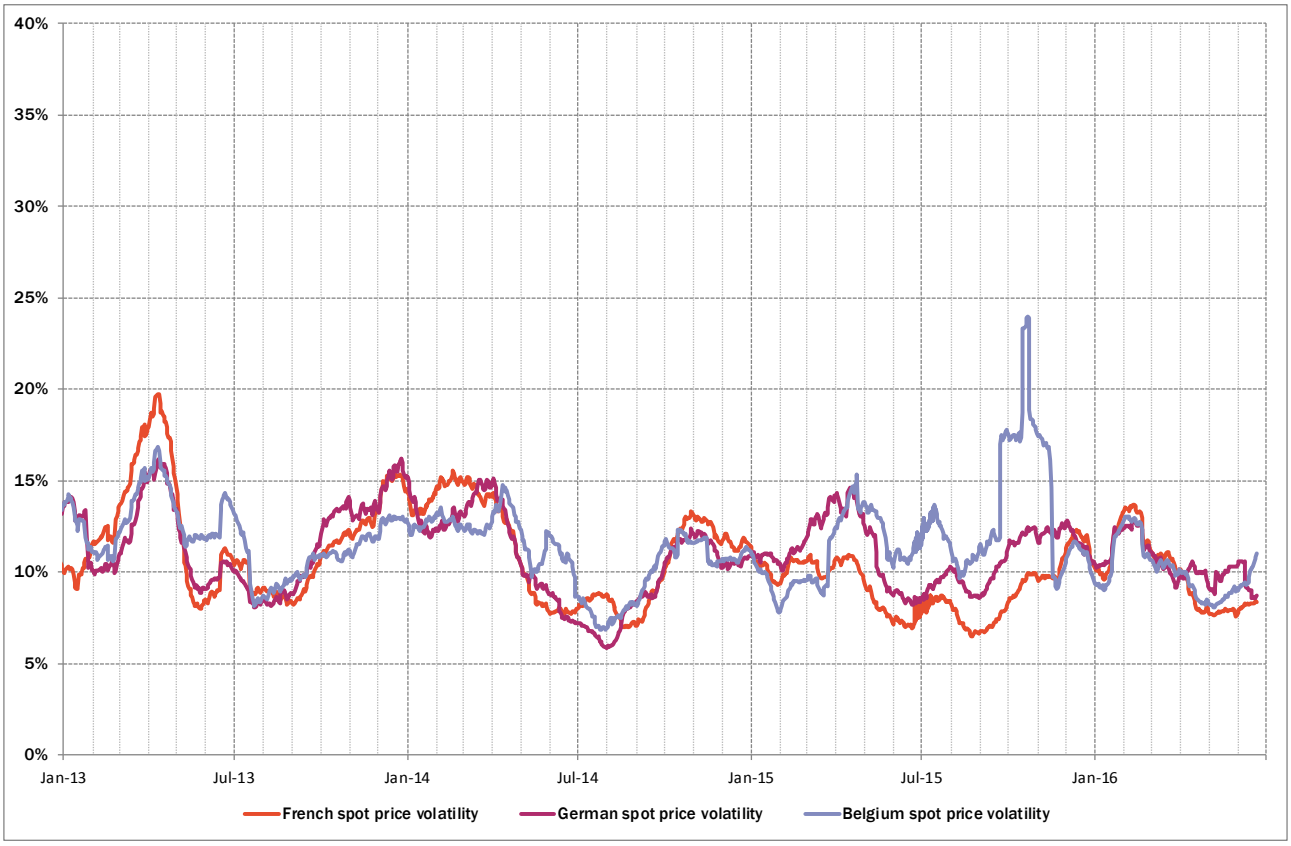
[38] Calculated as the difference between available production capacity and consumption

Graph 23: Spot prices and D-1 forecast margin of the French electricity system in 2015 and the first half of 2016



Source: RTE, EPEX SPOT

Graph 24: Volatility of day-ahead prices



Source: EPEX SPOT, Belpex - Analysis: CRE

2.1.2 A stable difference between spot prices and EDF's marginal costs in 2015

With regard to the formation of the spot price, CRE specifically monitors differences existing between the prices in the spot market and the marginal costs of EDF's generation facilities resulting from the calculation of its daily optimisation models.

On average, the price-cost difference[39] during these periods in 2015 was 5.3 %, i.e. a level comparable to that recorded in 2014 which was 5.5 % (4.5 % in 2013) (see 2014-2015 and 2013-2014 Surveillance Reports). Ever since CRE started to measure this indicator (2008), it has never exceeded 6.5 %.

CRE questioned EDF about the factors behind the result measured in 2015. EDF highlighted greater sensitivity of its marginal costs to variations in demand because of the low availability of coal production facilities particularly in summer 2015.

CRE considers that the difference measured for 2015 remains within a range that does not reflect the exercise of market power.

2.1.3 A spot price difference with Germany at an average €6.9/MWh in 2015 and an average coupling rate of 26.5 % of the time with Germany

The year 2015 was marked by the extension of French day-ahead market coupling with the Italian market as from February. France is now coupled with all bordering countries, with the exception of Switzerland. In May 2015, flow-based market coupling was launched with Belgium, Germany and the Netherlands. Flow-based coupling is a market coupling mechanism which consists in optimising interconnection capacity in the day-ahead timeframe by directing electricity from the country where the price is cheapest to the country where it is the highest.

The evolution of the coupling rate between French prices and those of bordering countries is heterogeneous (Graph 25).

As in 2014, France – Belgium coupling dropped in 2015 due in particular to the tight supply context of the Belgian network with the reduction in its nuclear and coal production. Belgian prices were therefore driven upwards with, in particular an average spot price going from €40.79/MWh in 2014 to €44.74/MWh in 2015. Despite the growth in Belgium's import balance with its neighbouring countries, its import balance remained stable with France (about 16 TWh).

Coupling with Germany dropped considerably in 2015 (coupling duration was almost halved between 2014 and 2015) and France's import balance with this country increased by approximately 3 TWh. Contrary to France, German spot prices were down in 2015, against the drop in the price of coal and the increase in renewable energy production. The baseload German spot price was €31.70/MWh in 2015, i.e. a drop of €1.1/MWh compared to 2014.

In general, French prices tend to be higher than German prices during winter because of the thermo-sensitive nature of French demand, which contributes to a positive average annual price spread. Against colder temperatures in winter 2014/2015 than in winter 2013/2014, French prices were driven up by the increase in demand and low runoff compared to 2014, whereas German prices were pulled downwards by coal prices and high renewable-based production. Therefore, the France-Germany price spread was €6.9/MWh in 2015, i.e. a significant increase of €5/MWh compared to 2014 (Graph 26).

In 2015, the France-Belgium price spread stayed at almost the same level as that in 2014, i.e. €-6.2/MWh compared to €-6.1/MWh in 2014 (Graph 27).

Since March 2014, France has been coupled commercially with Spain, and since February 2015, with Italy. Exchanges with these countries have increased. Spanish imports from France have increased by 45 % and exports from Spain to France, by 43 %. The net export balance between France and Spain is 7.3 TWh.

Because of the characteristics of the Italian market, where almost 50 % of demand is met by fossil fuel and 15 % by imports[40], spot prices tend to be significantly higher than French prices, which explains the low coupling rate with this border and a high use rate of interconnection capacity from France to Italy (98 %)[41].

[39] This indicator assists in detecting the exercise of market power. This analysis is carried out on a daily basis, based on data received monthly, and covers the times for which EDF's offers are supposed to determine the auction price.
[40] Source: ENTSO-E
[41] Source: RTE

Graph 25: Quarterly coupling rate of hourly prices with coupled countries

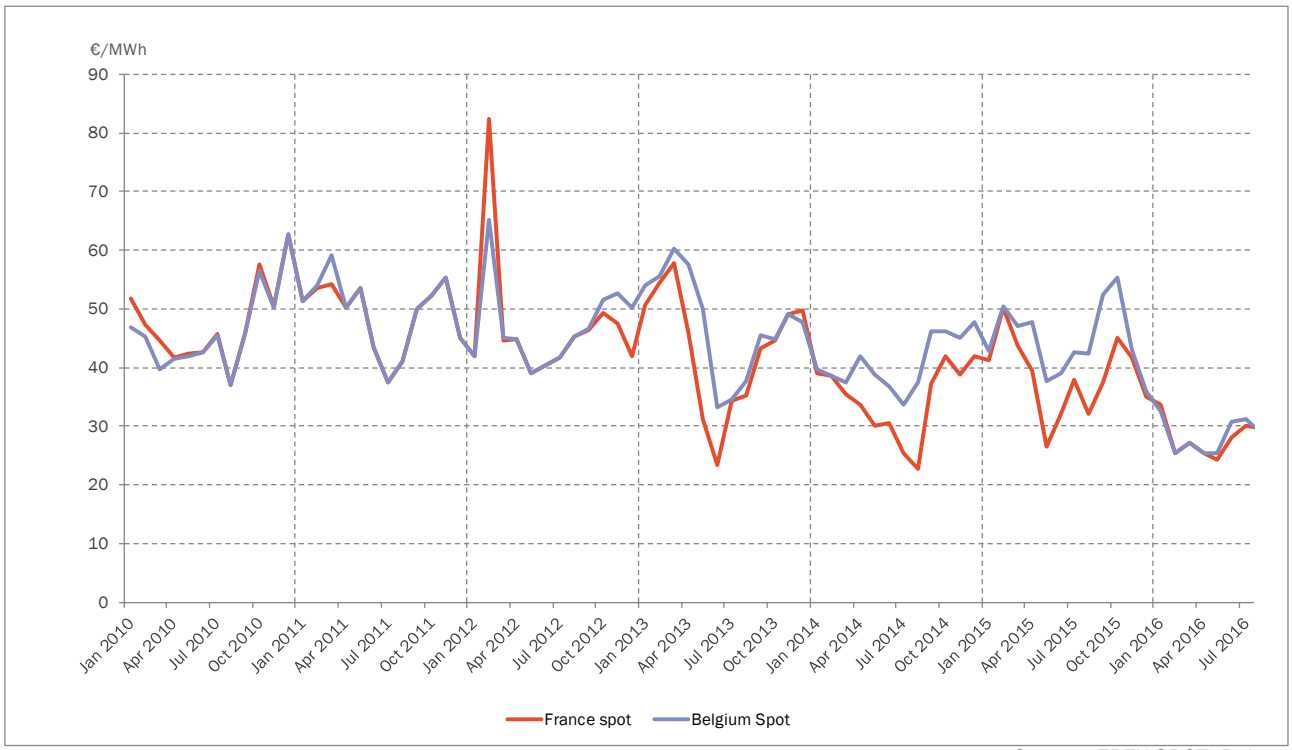
Source: EPEX SPOT, Belpex, OMEL, IPEX

In the first quarter of 2016, favourable weather conditions led to a drop in demand in the Central West Europe (CWE) zone and therefore reduced the price difference between France and its borders. The France-Belgium price spread was €-0.4/MWh in the first half of 2016, compared to €-5.2/MWh for the same period in 2014, and the France-Germany spread was €2/MWh in the first half of 2016 compared to €8.6/MWh for the same period in 2014.

Graph 26: France and Germany spot prices (Monthly average)

Source: EPEX SPOT

Graph 27: France and Belgium spot prices (monthly average)



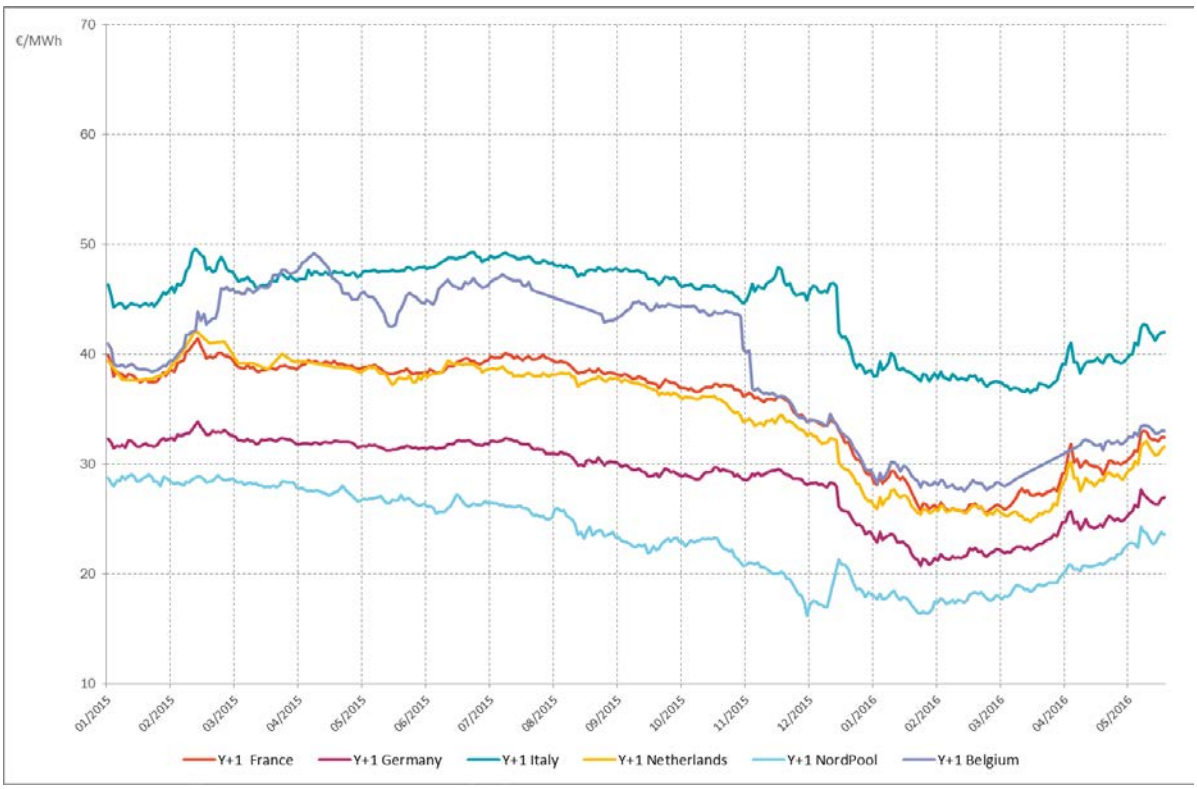
Source: EPEX SPOT, Belpex

2.2 Futures prices down throughout 2015 before picking up in the first half of 2016 following gas and coal prices

2.2.1 Increased volatility, both in France and in Germany

The evolution of futures electricity prices in Europe was heavily correlated to that of fossil fuels (gas, coal and oil) in 2015 and in the first half of 2016 (Graph 28). All European prices followed the drop which first affected oil prices at the end of 2015 and early 2016. Since March 2016, prices have increased slightly, influenced by a small pickup in gas and oil prices, but mostly in coal prices. Belgian prices, which had deviated from French and Dutch prices in February 2015 following the disconnection of units at the DOEL and TIHANGE nuclear plants, converged again in November 2015 upon the announcement of the plants' restart.

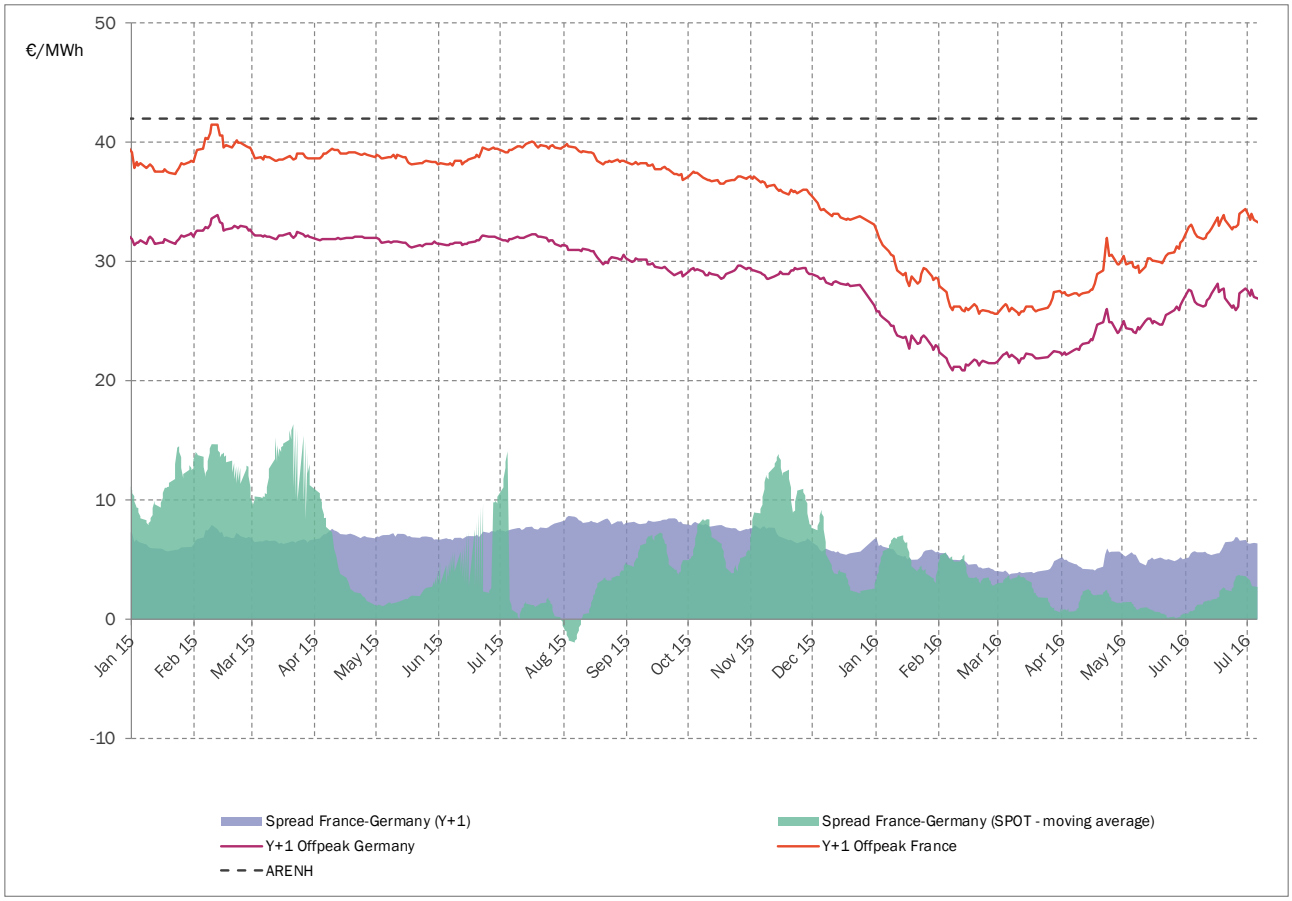
Graph 28: Price of Y+1 products in Europe



Sources: EPD, ICE ENDEX, Heren

Calendar product prices for the following year saw very similar trends in France and Germany in 2015 and the first half of 2016, which highlighted the impact of the price of the German product, especially influenced by changes in coal prices, on the price of the French product (Graph 29). The price spread between the two countries narrowed following the price drop and stood at around €5/MWh in the first half of 2016, far from the €9/MWh reached in 2014 when French prices stabilised at the level of the ARENH price.

Graph 29: Prices and spreads between the French and German calendar products



Sources: EPEX SPOT, EEX

The French price was also influenced intermittently by the announcement of a floor price for CO_2 in France for the electricity sector, made by the French president on 25 April 2016[42]. The forward market reacted then with a €2/MWh increase in calendar products before the price was corrected (Graph 31).

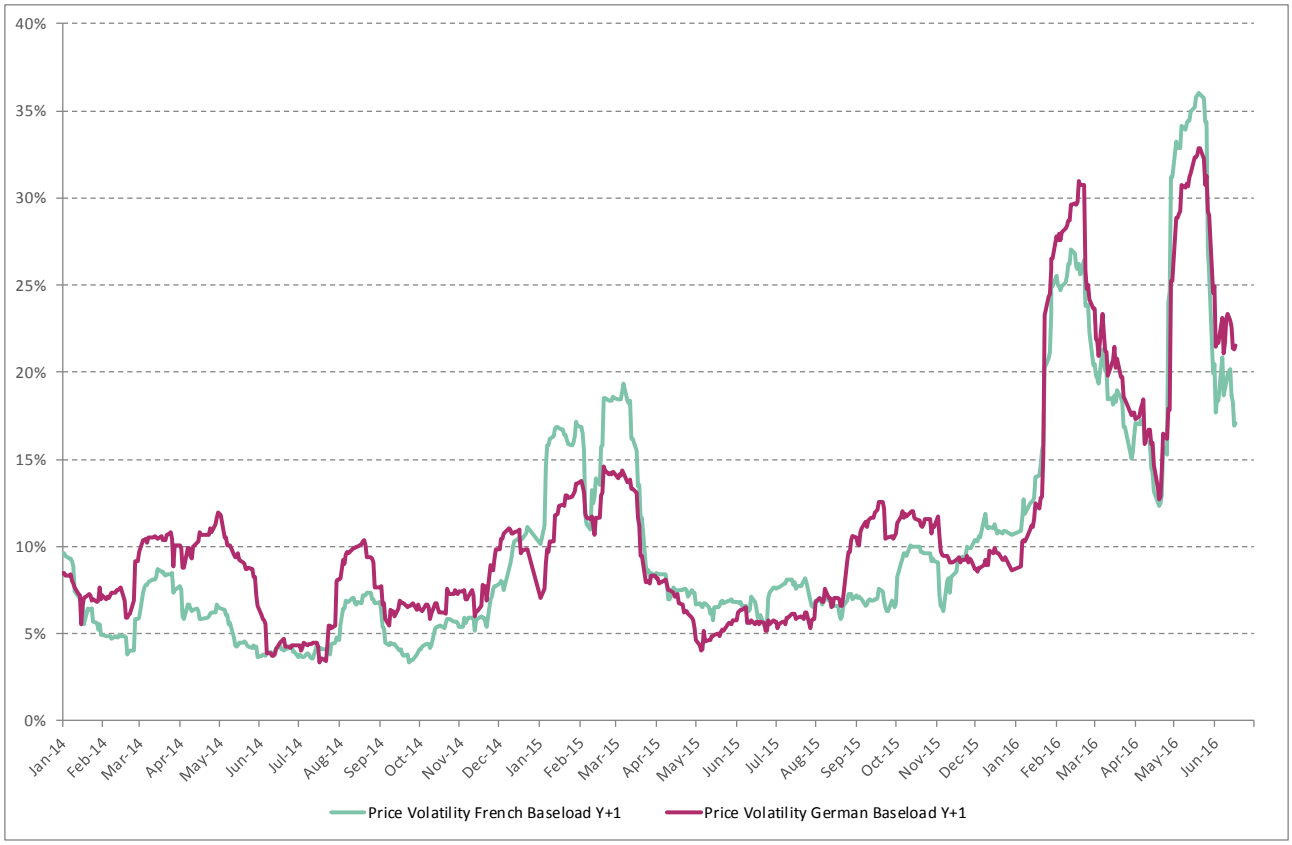
Wholesale electricity prices increased sharply over the last two weeks in September and the 2017 calendar product went from €32/MWh at the start of September to €40/MWh at the start of October. This increase occurred against low effective availability of the nuclear sector and information stating that nuclear unit outages were being extended[43].

Current uncertainty concerning the availability of nuclear generation is responsible for the pickup in wholesale prices. This increase, given its magnitude and quick pace, is likely to have a major impact on energy markets. In this context, CRE will be particularly attentive to the conditions of this price increase and in particular to compliance with the transparency obligations of the REMIT regulation.

Volatility in the French and German Y+1 calendar products increased during two periods in the first half of 2016 (Graph 30), the first following the steep drop in prices, caused by the fall in commodity prices, in January and February 2016. Volatility of the German product at that time had been greater, since it is more sensitive to changes in the price of fossil fuel. The second, at the end of April 2016, was seen following the announcement of the CO_2 floor price. At this point, it was the French product that became more volatile, since the announcement related directly to French plants.

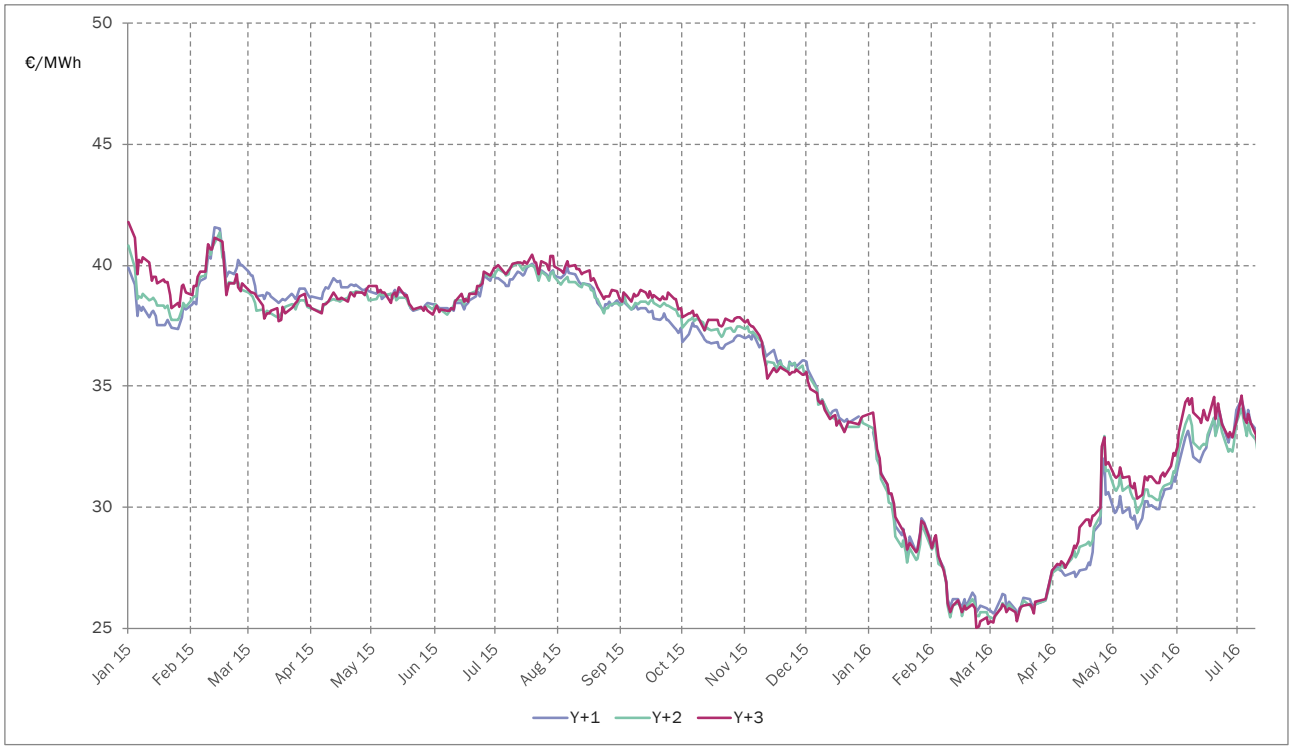
[42] http://www.elysee.fr/declarations/article/discours-lors-de-la-4e-conference-environnementale-2/
[43] Within the framework of EDF's financial disclosure, information on nuclear production objectives for 2016 and 2017 were communicated to the market.

Graph 30: Volatility of calendar product prices



Source: EPEX Spot

Graph 31: Evolution of the prices of calendar products in France for the next three years

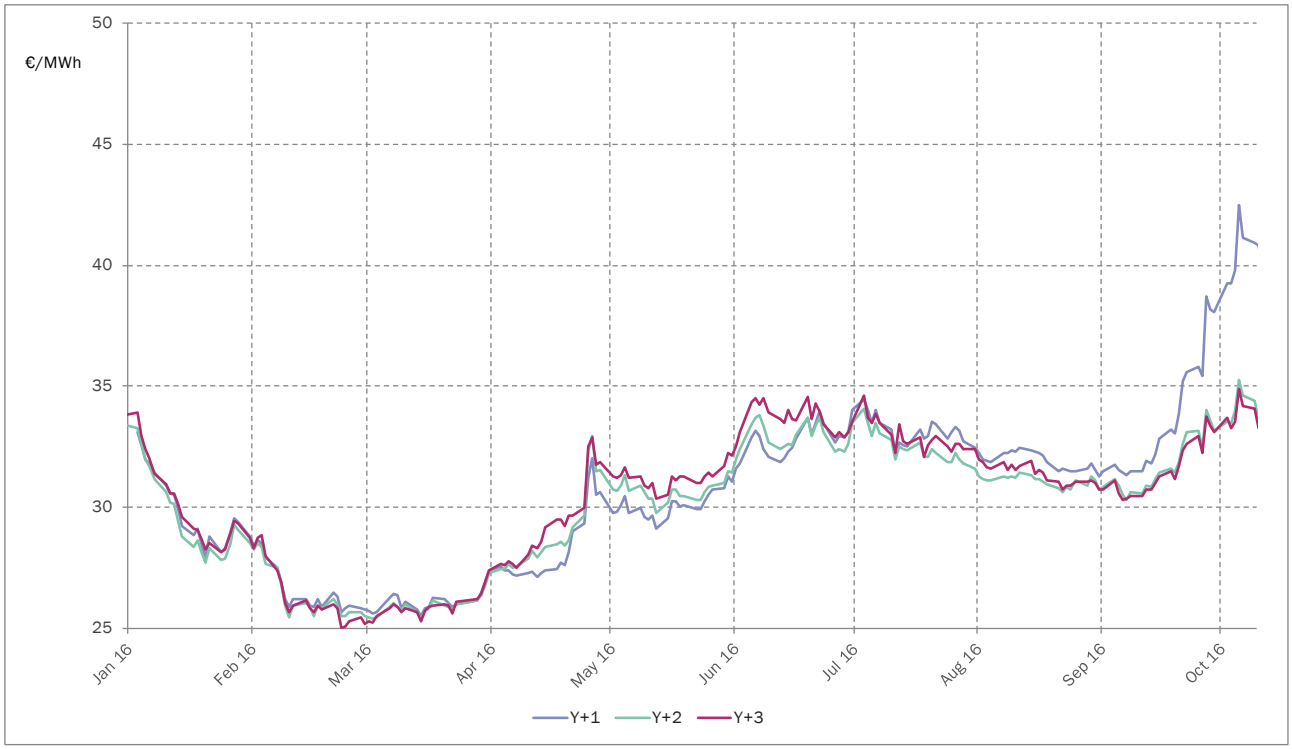


Source: EEX

2.2.2 A recovery in calendar product prices which might be associated with renewed interest in ARENH subscriptions

Below €42/MWh since the end of 2014, calendar prices bottomed out in March 2016 and then picked up in the second half following the movement followed by raw materials. The faster pace of this recovery since September reflects information concerning the extension of nuclear unit outages (Graph 32). The calendar product for delivery in 2017 now stands at about €40/MWh, i.e. at a level that might rekindle interest in the ARENH product if wholesale prices continue to increase. Products with two-year and three-year timeframes are at lower levels than those of the Y+1 product.

Graph 32: Focus on the recent evolution of calendar product prices in France



Source: EEX

3. MAJOR GROWTH IN VOLUMES EXCHANGED IN 2015 FOR ALL MATURITIES

The increase which had already started in 2014 in electricity wholesale market exchanges continued in 2015. Total volumes traded in 2015, excluding bilateral transactions, amounted to 1,466 TWh compared to 932 TWh in 2014, i.e. a 37 % increase (Graph 33). Volumes traded in 2015 are valued at €52 billion.

This overall increase concerned all products, with the exception of intraday products which increased by only 4 %. The greatest increase concerns annual products at 42 %. This increase is due in part to the shift of ARENH products to the forward market and renewed interest in purchases of these products because of their price level.

In the first half of 2016, the overall increase in volumes traded continued compared to 2015 with a moderate increase in day-ahead product volumes (+16 %) and a sharp increase in calendar product volumes (+104 %). Volume peaked in April 2016 following announcements concerning the implementation of a CO_2 floor price. These announcements also caused significant price movements in calendar products.

More specifically in the forward market, trade continues to develop thanks to a marked increase in volumes in the futures market exchange (Graph 34 and Graph 35). Annual products remain the most traded products and are responsible for the main peaks in volume in 2015 and 2016.

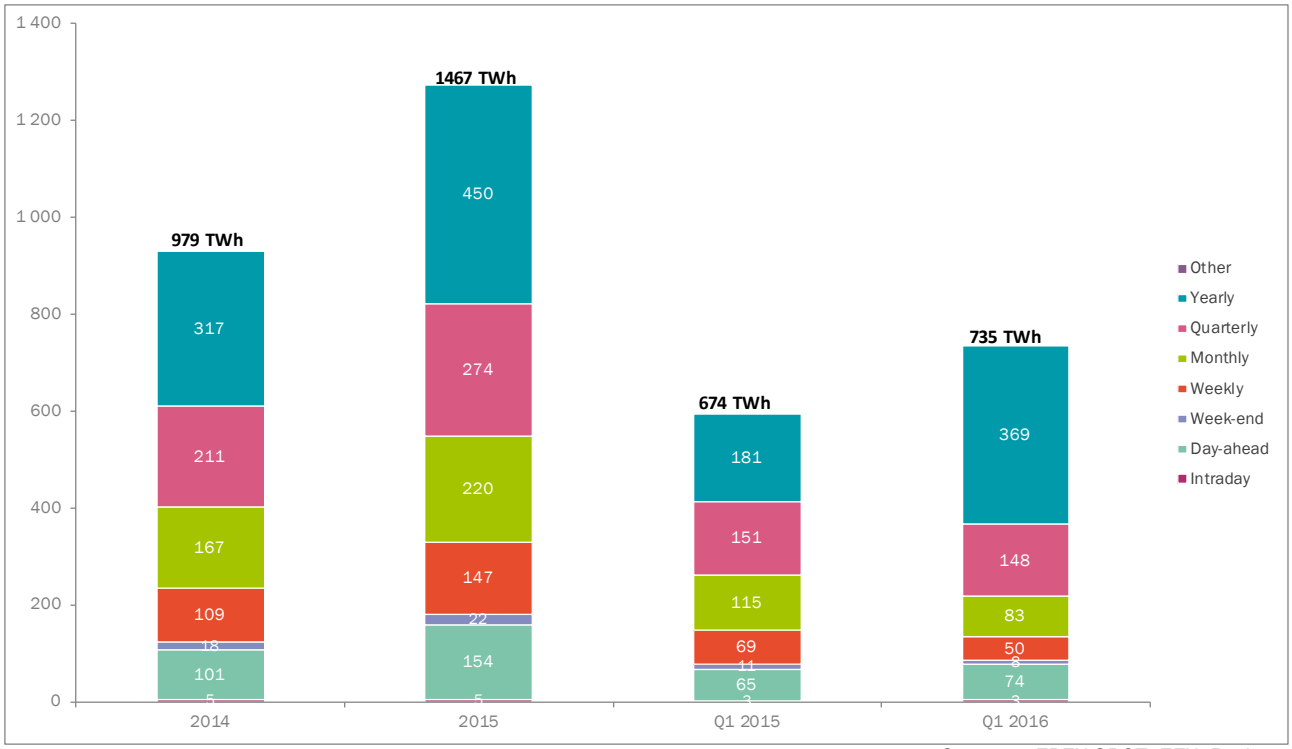
The increase in volume benefitted power exchanges whose market share grew by 1 point for the day-ahead and intraday exchange, and by 4.1 points for the futures exchange (Table 16). However, most of the forward product volumes traded (roughly 80 %) were handled by brokers. The types of wholesale electricity market participants are summarised in Table 17.

Table 16: Portion of trading by platform and maturities

	2015	2014
Exchange DA + Intraday	8.8 %	7.8 %
Exchange Futures	7.9 %	3.8 %
Brokers DA	3.7 %	3.6 %
Brokers Futures	79.6 %	84.8 %

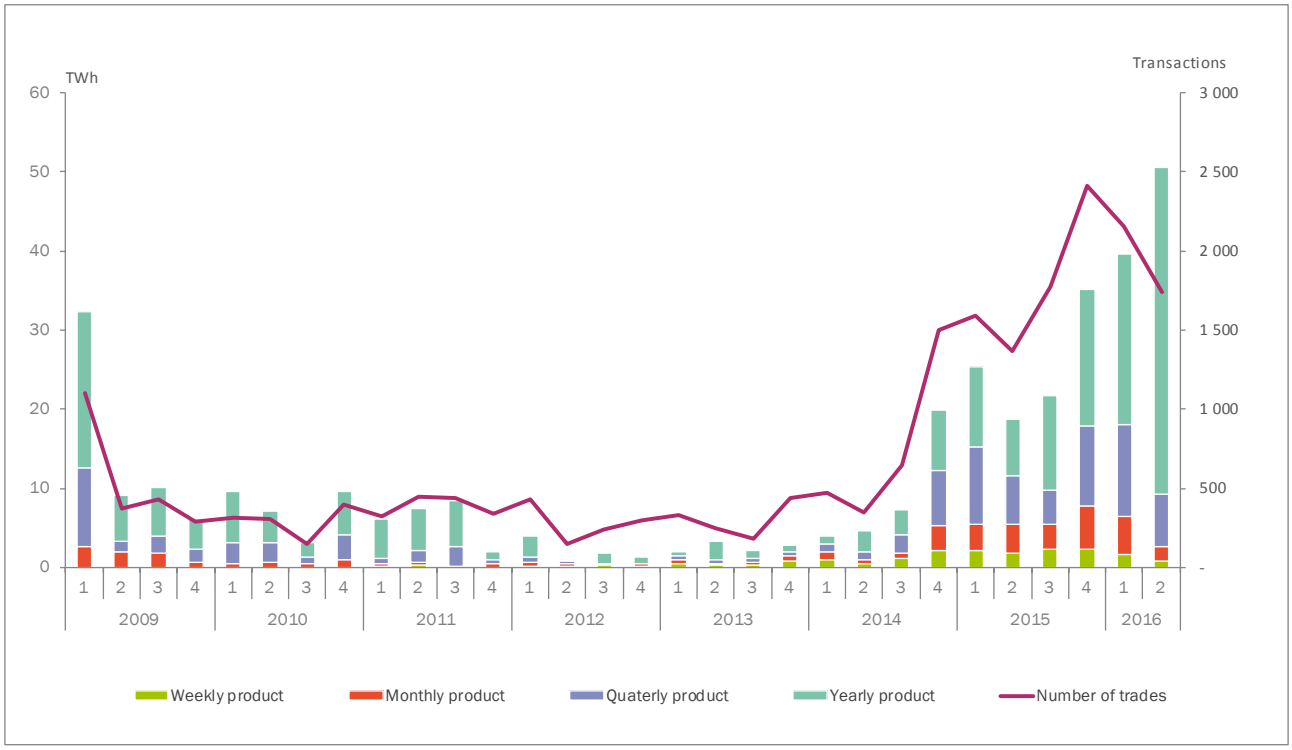
Sources: EPEX SPOT, EEX, Brokers

Graph 33: Volumes traded in the wholesale markets



Sources: EPEX SPOT, EEX, Brokers

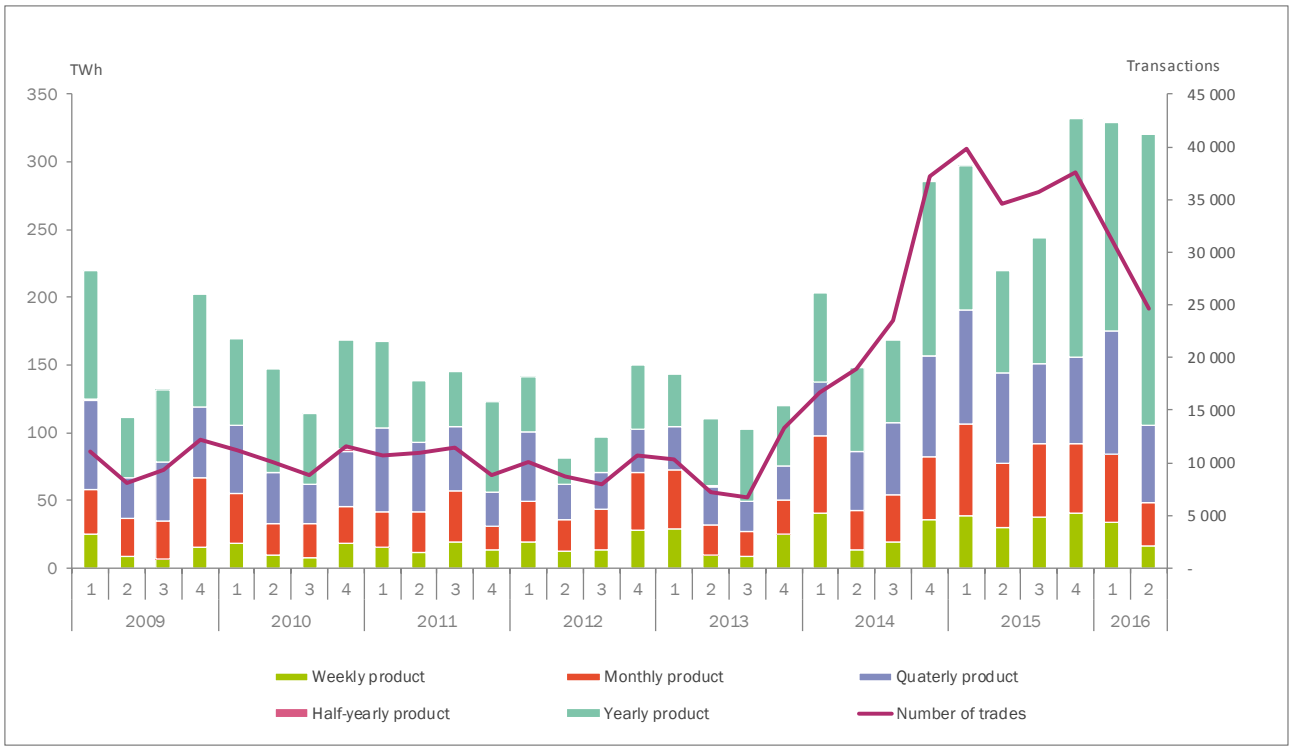
Graph 34: Volumes traded in the forward exchange



Source: EEX

NB: OTC cleared volumes in exchanges are no longer taken into account in the graph as from the present report.

Graph 35: Volumes traded in the brokered and organised market



Sources: EEX, Brokers

Table 17: Breakdown of wholesale electricity market participants in France

	2013	2014	2015	Annual variation 2015/2014 As a percentage	Annual variation 2015/2014 As a value
Active balance responsible entities	136	151	150	-1%	-1
Active electricity generators	25	22	23	5%	1
Holders of capacity from VPP auctions	24	10	5	-50%	-5
Holders of ARENH access rights	18	20	14	-30%	-6
End customer suppliers	28	26	30	15%	4
Import/export participants	94	102	90	-12%	-12
Block exchange participants	108	113	112	-1%	-1
Exchange traders	97	105	97	-8%	-8

Sources: RTE

SECTION 4
WHOLESALE NATURAL GAS MARKETS

Consumption in France, albeit low despite a pickup compared to 2014, was supplied without any particular tightness. The increase in consumption is mostly linked to increased operation of gas-fired power plants. Stock levels returned to normal after very high levels the previous year.

Gas prices dropped throughout 2015, reaching very low levels in spring 2016 before recovering. This movement was the same for all European markets, which saw closely related trends. At global level, prices converged in most zones, particularly between Europe and Asia, with the notable exception of US prices which remained the lowest, even though the difference with European prices narrowed because of the price drop in Europe.

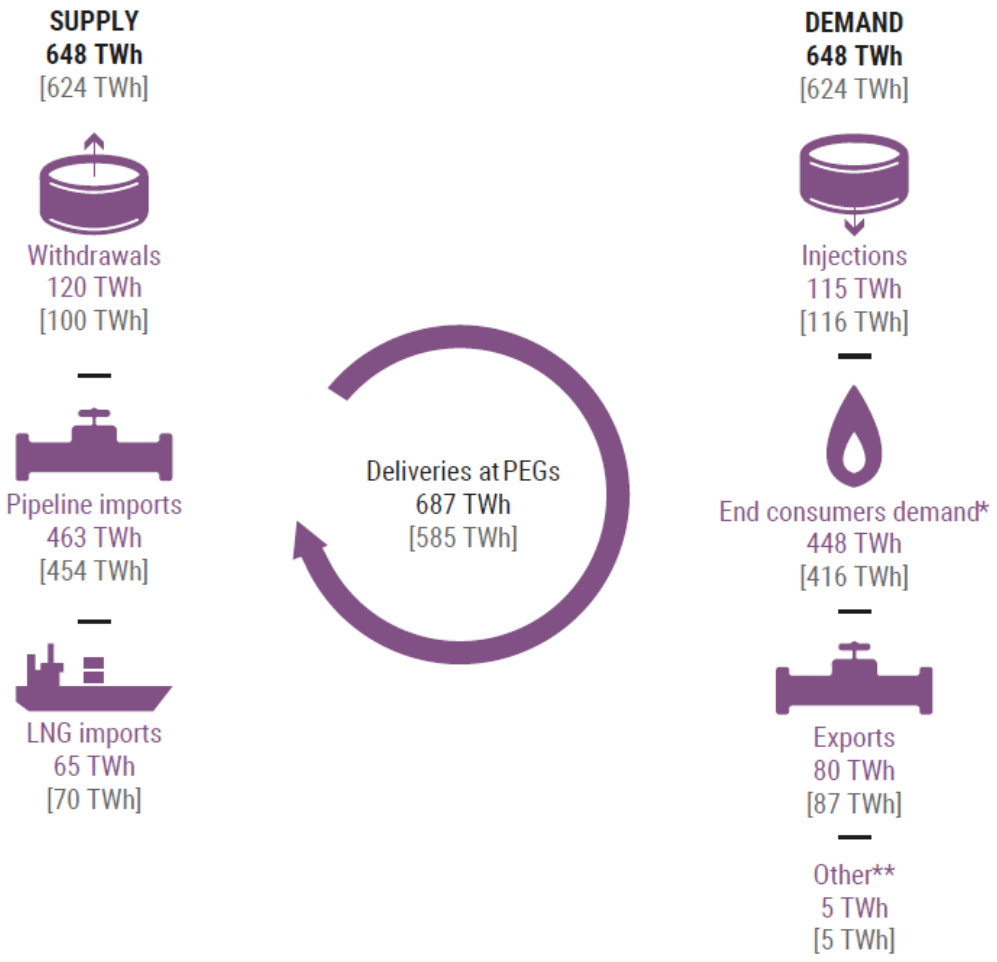
This context remains favourable to liquidity improvements, with volumes traded in the wholesale markets up 15 % compared to 2014.

1. REVIEW OF THE GAS SYSTEM: PICKUP IN CONSUMPTION IN 2015, THOUGH STILL AT LOW LEVELS

1.1 Increase in gas demand associated with power production

The 2015 gas consumption followed an upward trend with an increase in supply and demand volumes up 3.8 % compared to 2014 (Graph 36). The development in demand is mainly linked to end consumers' consumption which increased 8 % in 2015. In addition, 2015 was marked by good supply and the absence of tightness in infrastructure use, with in particular, greater use of storage (+20 % release) and a slight increase in land imports (+2 %).

Graph 36: Supply and demand in the French system 2015 [2014]



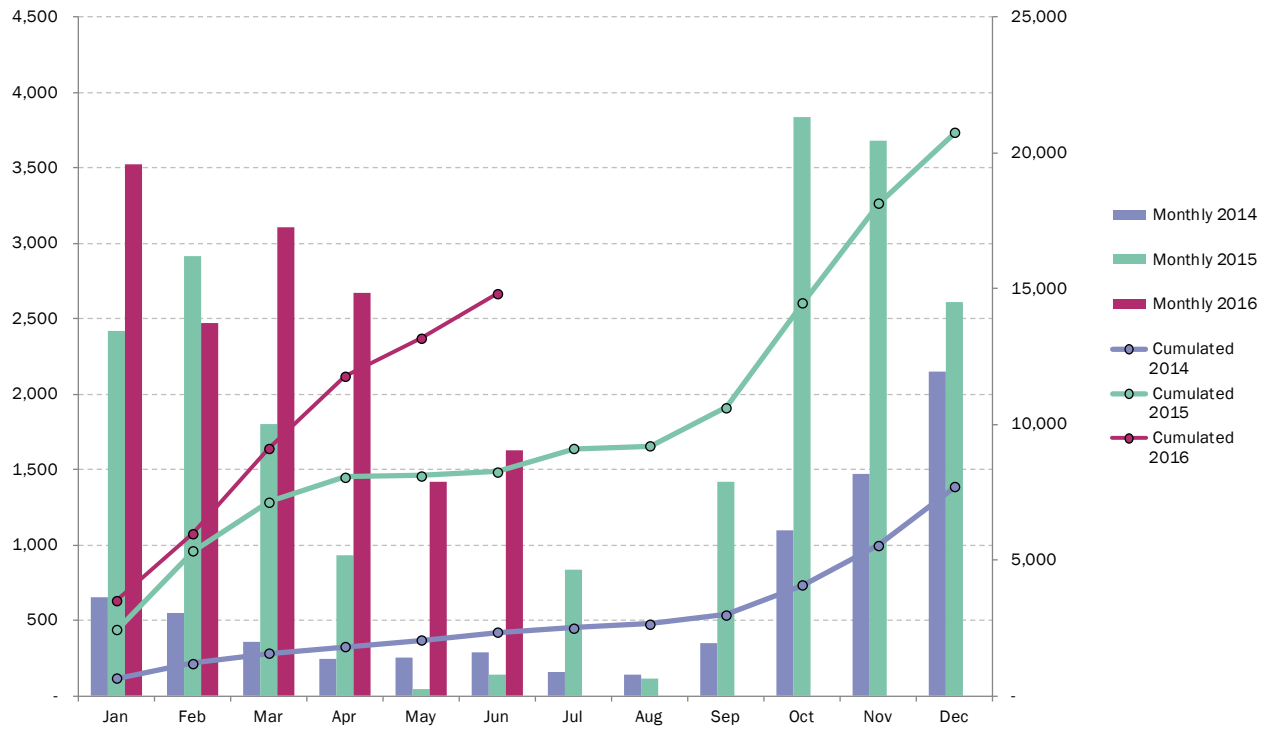
** The Other item corresponds to the volume consumed by the TSOs and the DSOs to ensure the operation of the network (self-consumption, counting error, losses ...)

* Customers at regulated prices and customers at market prices included

Sources: GRTgaz, TIGF – Analysis: CRE

Against low commodity prices, gas power plants margins improved. Their annual consumption almost tripled in 2015 compared to 2014 contributing to 40 % of the increase in total consumption of end consumers (Graph 37). The trend continued into 2016 with cumulated consumption up by roughly 70 % in the first half of 2016 compared to the same half-year period in 2015.

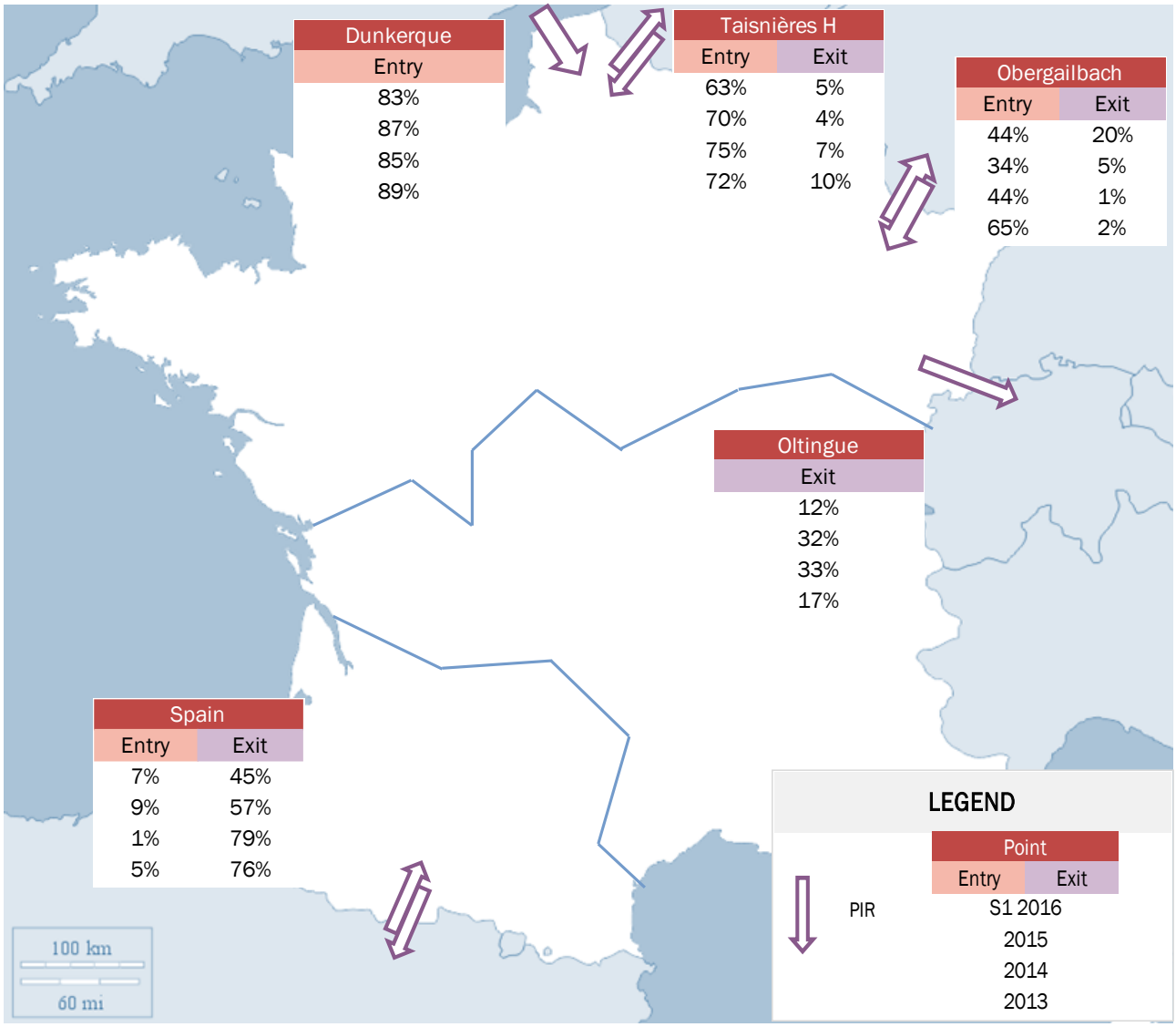
Graph 37: Consumption of high modulation sites



Sources: GRTgaz, TIGF – Analysis: CRE

At borders, imports/exports in 2015 were marked by the modification of commercial flows to Spain with the pickup in import flows which reached 5.6 TWh compared to 0.4 TWh in 2014 and the drop in exports to 36.8 TWh compared to 49 TWh in 2014. Nevertheless, physical flows with Spain remained export-oriented in 2015, i.e. in the France to Spain direction. The opposite movement was seen at Obergailbach with import volumes down to 74.6 TWh in 2015 compared to 78.4 TWh in 2014 and export volumes up to 2 TWh in 2015 compared to 0.5 TWh in 2014 (Graph 38).

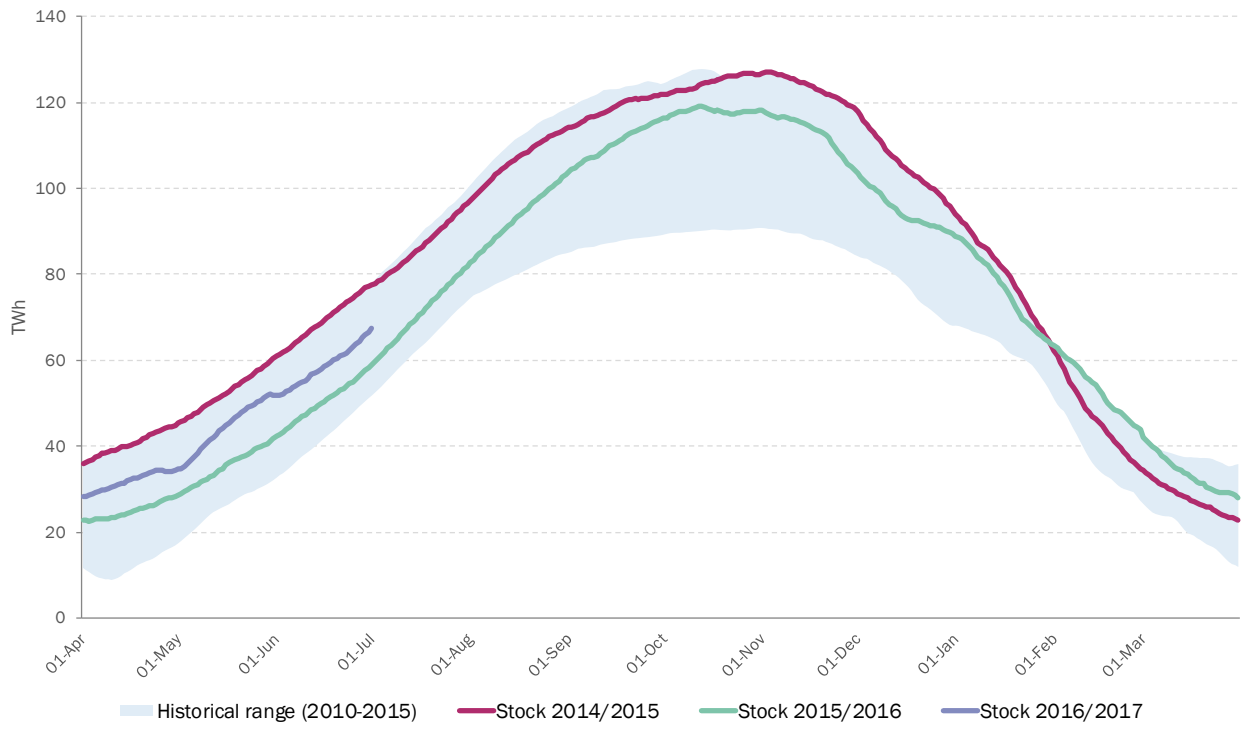
Graph 38: Use rate of French interconnections (trade flows)



Sources: GRTgaz, TIGF – Analysis: CRE

With regard to storage, withdrawals exceeded injections by 5 TWh, which resulted in a drop in stock levels. Stock levels therefore returned to normal after a 2014/2015 gas year marked by particularly high stock levels because of the mild winter (Graph 39).

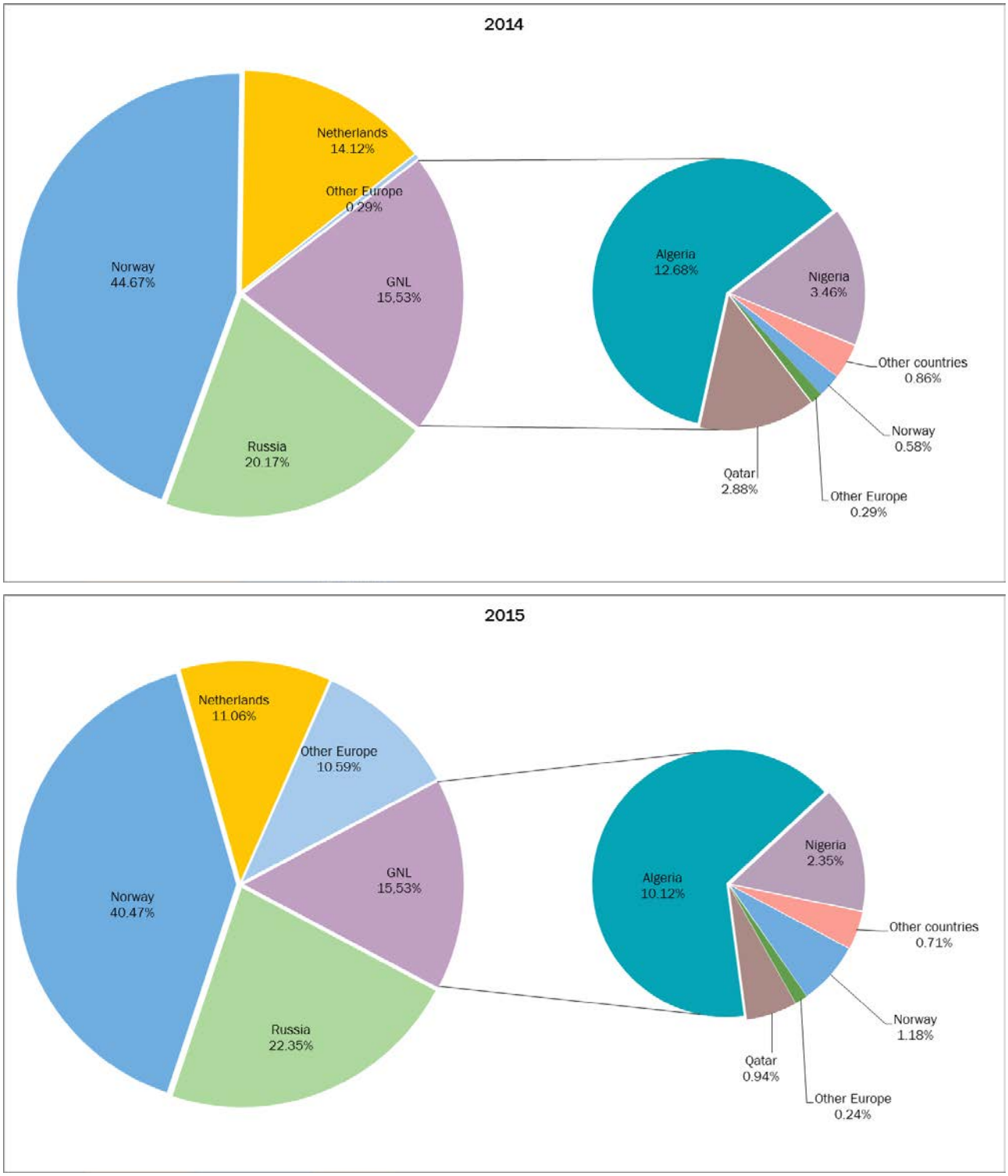
Graph 39: Stock levels in France



Sources: Storengy, TIGF – Analysis: CRE

The market share of gas supply sources changed very little between 2014 and 2015 (Graph 40). Notable points are the slight recovery in market share by Russia at the detriment of Norway and the Netherlands. However, the supply share of "Other European countries" increased due to supply growth in markets whose sources are hard to identify.

Graph 40: Origin of French natural gas supply



Source: BP Statistical Review of World Energy – Analysis: CRE

2. GAS PRICES DOWN IN 2015 FOLLOWING THE GENERAL TREND OF ENERGY COMMODITIES

2.1 A spot price averaging €19.9/MWh in 2015 before bottoming out at €11.3/MWh in April 2016

In 2015 and the first half of 2016, gas prices followed the general downward trend in the prices of other energy commodities. In the European spot markets, the pickup seen in winter 2014/2015 was erased throughout 2015 against good supply and consumption affected by a very mild winter (Graph 41). This trend was not affected by the arrival of winter 2015/2016, with prices dropping to €12.7/MWh at the end of February because of a particularly mild winter. This trend continued until mid-April when prices reached €11.3/MWh (12 April), i.e. the lowest level recorded since 2010. A correction was then seen as from the second half of April. The increase was in response to short-term fundamentals[44]. Despite this increase, European spot prices remained at very low levels (lower than €15/MWh) for the rest of the first half of 2016.

Graph 41: Gas spot prices in Europe

Source: ICIS Heren; Analysis: CRE

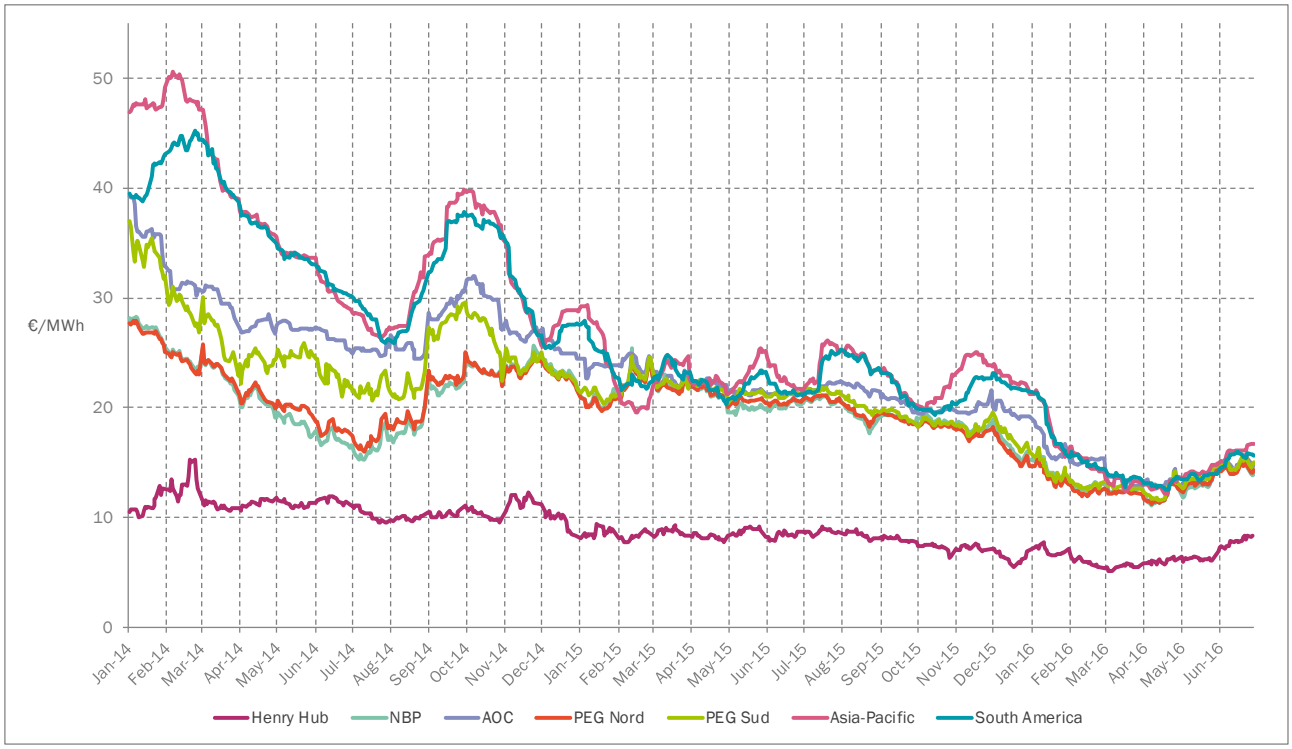
There was a major convergence among European markets which reflects the absence of physical congestion between the different countries and the fluidity of European spot markets. The average difference in European spot prices in 2015 and the first half of 2016 was typically around €0.29/MWh compared to €0.36/MWh in 2014 and €0.53/MWh in 2013.

2.2 A convergence trend for global gas prices, with the exception of the US price

Apart from the convergence between the different European spot market prices, the year 2015 was marked by the convergence of gas prices in the main regions (Europe, Asia, USA and South America). While the Henry Hub, the reference US market, remained the market in which prices were the lowest (average €8.1/MWh in 2015 and €6.6/MWh in 2016), the difference between this market and the other gas regions dropped considerably, going from about €20/MWh early 2014 to almost €7/MWh in the first half of 2016 (Graph 42).

[44] In particular linked to problems concerning gas supply from Norway

Graph 42: Global gas prices



Source: ICIS Heren; Analysis: CRE

The difference between Asian and European prices, which reflects among other things, tightness in LNG supply to Europe[45], dropped significantly in 2015 and the first half of 2016. The major drop in LNG prices in Asia is due not only to the drop in demand (-1.7 % in 2015[46]), but also the decline in oil prices and the growth in supply. Prices in the Asian markets remained heavily influenced by oil because of the strong indexing of long-term supply contracts to this commodity. From the supply perspective, the increase in LNG exports in the Pacific region, sourced in particular from Australia, reduced imports from the Middle East and enabled this supply to be redirected to the Atlantic and Europe regions.

The Henry Hub also saw a downward trend throughout 2015 affected by the growth in shale gas production, high stock levels and a relatively mild winter. Prices in this market reached at minimum €1.64/MMBtu (i.e. €5.1/MWh) on 4 March 2016, which was its lowest level in over ten years.

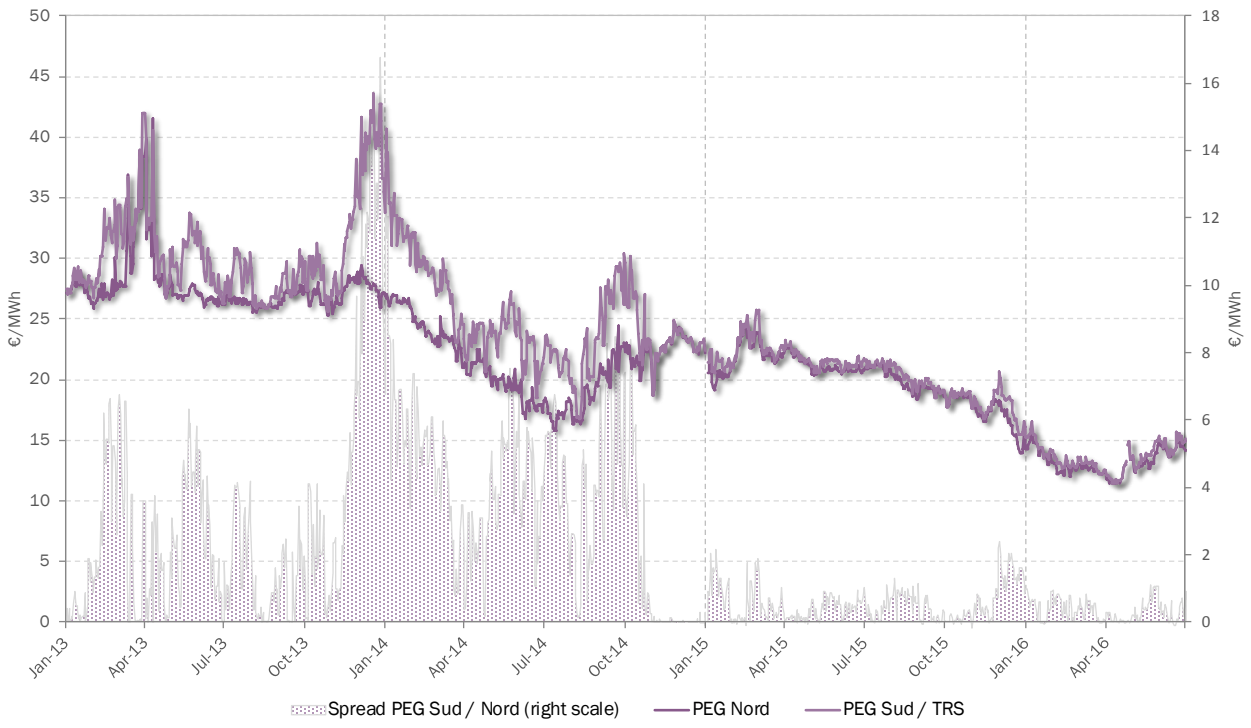
2.3 Near disappearance of price differences in France between the north and south

Spot markets in France were marked in 2015 by a notable and sustained drop in the price difference between the PEG Nord and the TRS[47] (North/South spread) (Graph 43). This reflects the absence of congestion in GRTgaz's north/south link, where the available capacity margin increased considerably throughout the year (Graph 44). This absence of congestion is the result in particular of a reduced use of the link: gas nominations in the north to south direction totalled 114 TWh in 2015 (i.e. -7.5 % compared to 2014) and 57 TWh in the first half of 2016 (i.e. -13.5 % compared to the first half of 2014).

Less use of the north-south link in 2015 is due in particular to the drop in exports to Spain (from 49 TWh in 2014 to 31 TWh in 2015) and the relatively high stock levels at the start of the year. These elements offset the consumption increase (+12 TWh) and the decline in LNG send-out from the Fos-sur-Mer terminals (-6 TWh). The major drop in exports to Spain is due in particular to the return of LNG in this market against a drop in potential arbitration with Asian markets because of the narrowed price difference between these two market zones (Graph 42).

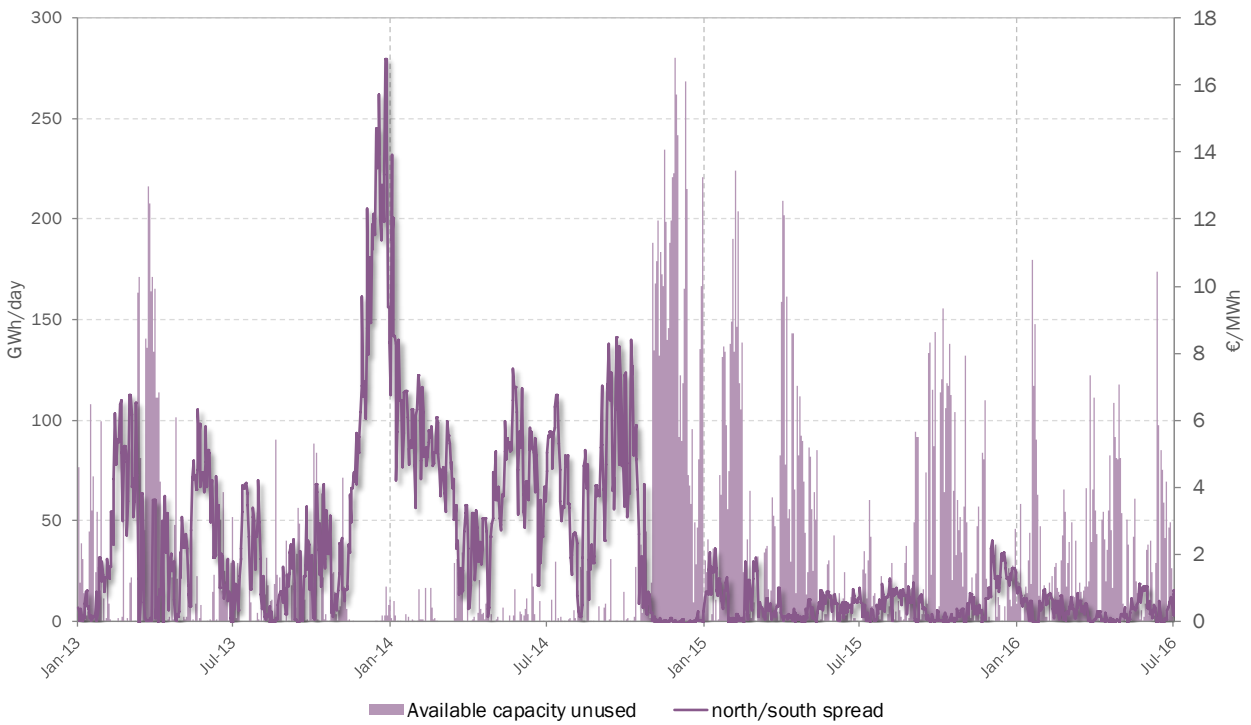
[45] The very high prices seen in the Asian markets between 2012 and early 2014 heavily affected LNG deliveries to Europe.
[46] Source: *BP Statistical review*. (http://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html)
[47] The TRS (Trading Region South) was created in April 2015 from the merging of the PEG Sud and the PEG TIGF. The north/south spread, calculated previously as the price difference between the PEG Sud and the PEG Nord, is now calculated as the difference between the TRS and the PEG Nord.

Graph 43: Evolution of the north/south spread in the spot market



Source: Powernext (EOD indices); Analysis: CRE

Graph 44: Use of the north to south link vs north/south spread



Sources: Powernext (EOD indices), GRTgaz; Analysis: CRE

2.4 A trend in the forward markets comparable to that of the spot market

European future gas prices followed the same global trend as other energies, with a major drop throughout 2015 and a pickup as from the second quarter of 2016 (Graph 45). In the first half of 2016, the differing downward trends for the different maturities, more marked for the closer maturities which are affected both by short-term and long-term factors, emphasised the growth in the curve: the difference between calendar 2017 and 2020 TTF products (the Netherlands) went from €0.14/MWh in January to €1.15/MWh in April 2016 (Graph 45). This difference narrowed again in the second quarter of 2016 with the general increase in European gas prices, bolstered in part by the recovery in oil prices.

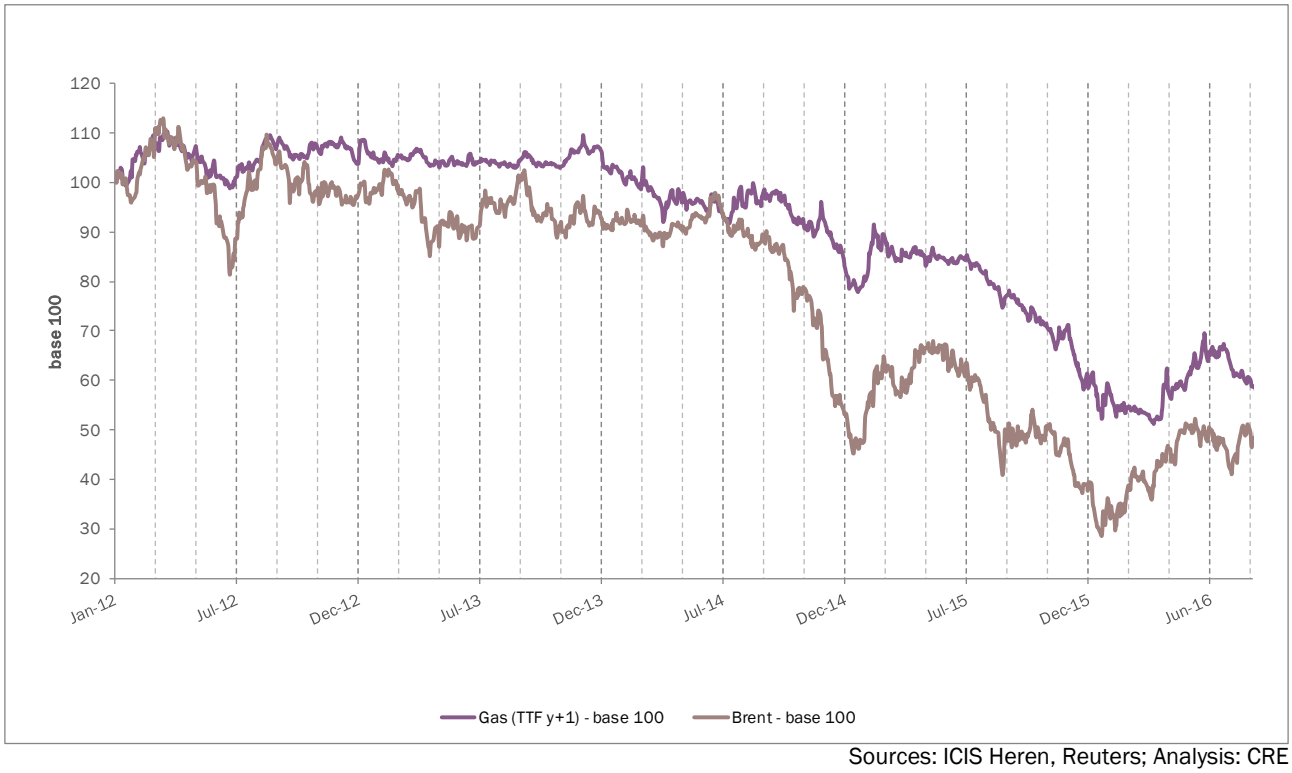
Graph 45: Future gas prices in Europe

Source: ICIS Heren; Analysis: CRE

In 2015, the difference between gas prices and oil prices widened against a very quick decline in crude oil prices (Graph 46). The direct influence of oil prices on European gas markets is now limited given that long-term contracts are now generally indexed to gas indices, to the detriment of oil indexing[48].

[48] For example, the tariff formula for estimating the material portion of ENGIE's supply costs in France, representative of its forward contracts, had a 77 % market indexing as at 1 July 2016.

Graph 46: Comparison between gas and oil prices (index base 100 = 01/01/2012)

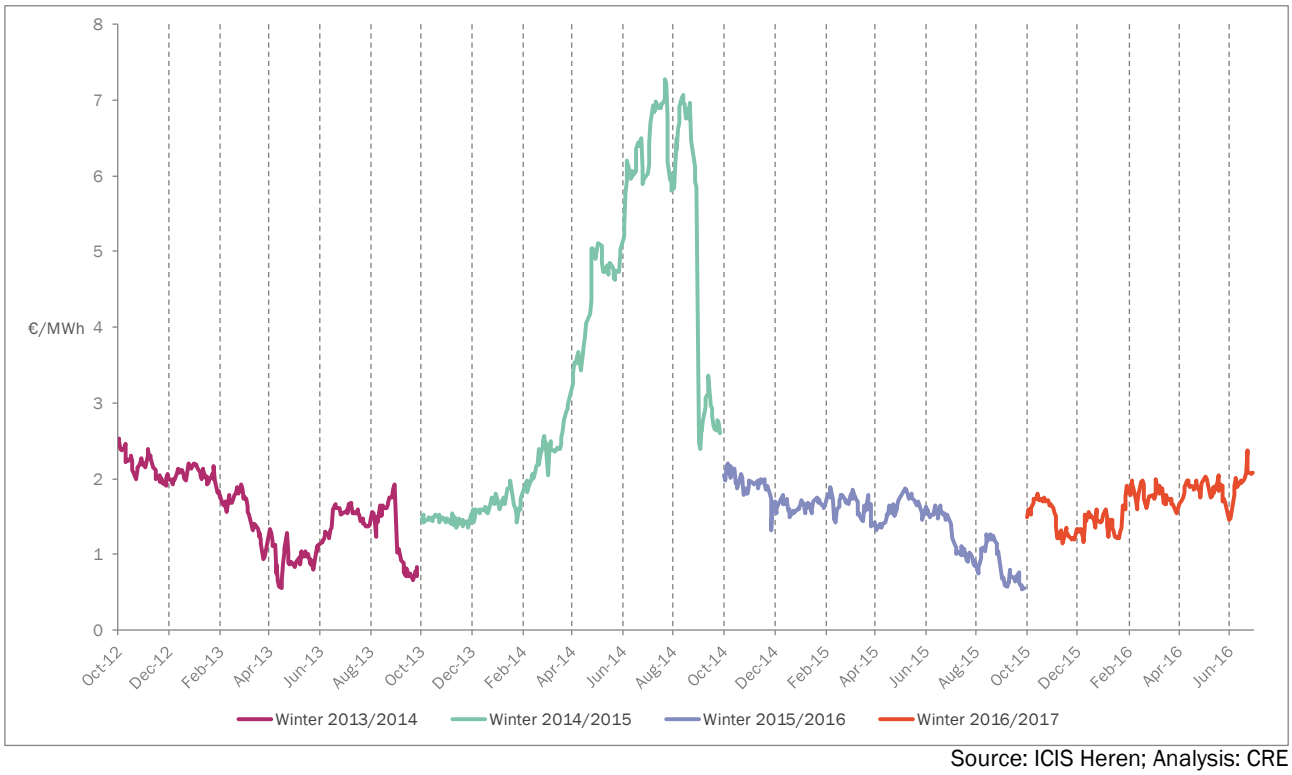


Sources: ICIS Heren, Reuters; Analysis: CRE

2.5 A very low winter/summer spread

After seeing a major increase in 2014, affected by winter supply risks linked to tensions in Ukraine[49], the summer/winter price difference dropped sharply in 2015 and remains very low in 2016 (Graph 47).

Graph 47: Summer/winter spread in France



Source: ICIS Heren; Analysis: CRE

This difference reflects the economic benefit for market participants to use underground storage in order to inject during summer and withdraw in winter. It can explain the high replenishment of French storage at the start of winter 2014/2015 and its dwindling for winter 2015/2016[50] (Graph 39).

The low summer/winter spread in Europe is due mainly to the comfortable supply market conditions, by low demand and winter weather conditions that limit seasonal changes.

3. TRADING IN THE WHOLESALE GAS MARKETS IN FRANCE: TRADE PROGRESSION IN THE SPOT AND FORWARD MARKET

3.1 Slight increase in PEG deliveries, more marked in the north than in the TRS

Wholesale gas trading in France is done over the counter, directly between market participants or through brokers, or via the organised market Powernext.

Trading in the French wholesale market is materialised at marketplaces called *Points d'échange gaz* (PEGs), virtual points where participants deliver gas to their counterparties according to their obligations. Following the merging of the PEG Sud and TIGF, entered into effect on 1 April 2015[51], the French market is currently organised into two marketplaces: the PEG Nord, attached to the Nord (north) balancing zone, and the TRS (trading region south) attached to the GRTgaz Sud and TIGF balancing zones.

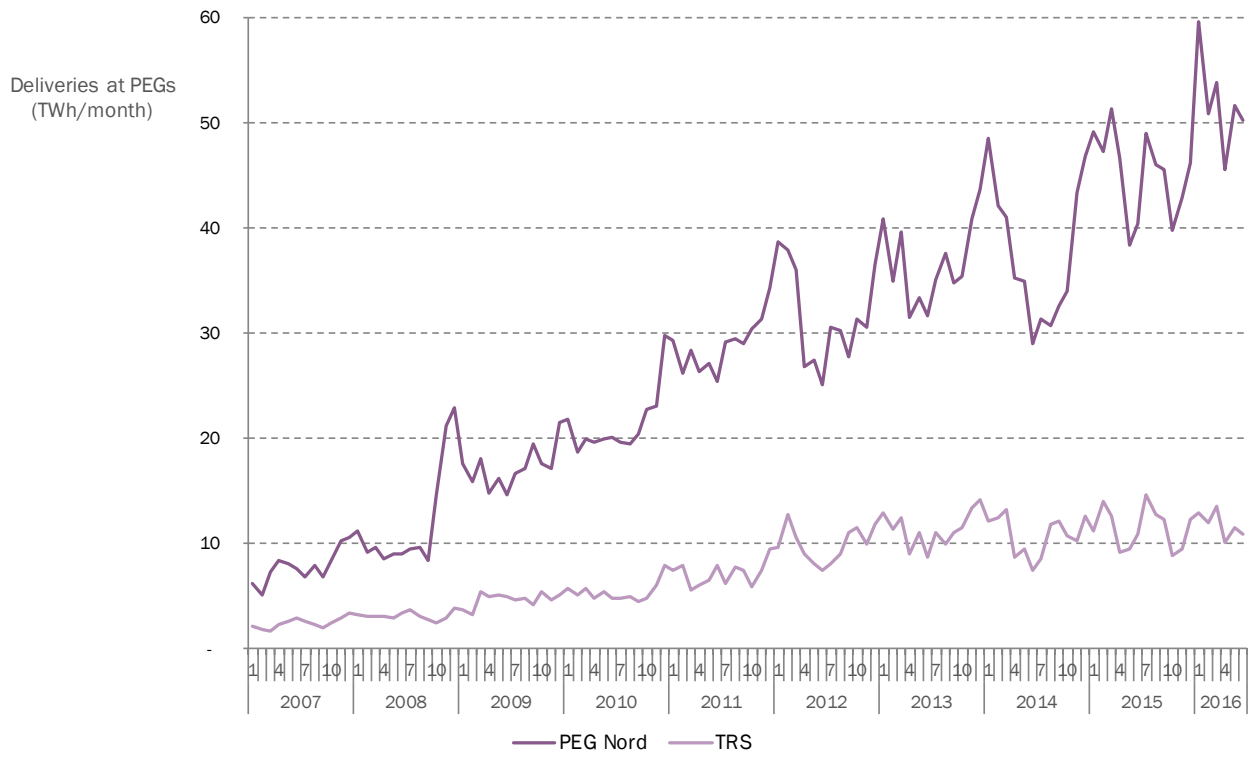
The present report distinguishes between volumes traded in the brokered and organised markets and physical deliveries at PEGs:

[49] See the Report on the functioning of wholesale electricity, CO_2 and natural gas markets in 2014-2015 (http://www.cre.fr/documents/publications/rapports-thematiques/rapport-marches-de-gros-2014-2015)
[50] Regulatory factors, such as storage requirements, are also behind the changes seen in terms of French storage replenishment (see decree No. 2014-328 of 12 March 204).
[51] In compliance with CRE's deliberations of 19 July 2012 and 13 December 2012

- brokered markets include all of the contracts signed between the different participants through the exchange or brokers;
- deliveries at the PEGs cover net daily deliveries made between pairs of participants at the PEGs.

In 2015, deliveries at PEGs continued the growth seen since 2005 (Graph 48). However, the evolution of those deliveries follows a different pace according to the different marketplaces. The growth in the volumes delivered at the PEG Nord was very high in 2015, with a 21 % increase compared to 2014, while in the TRS, deliveries increased by only 6 % compared to 2014 and were only slightly higher than 2013 deliveries.

Graph 48: Deliveries at PEGs



Sources: GRTgaz, TIGF – Analysis: CRE

The major growth in volumes delivered continued in HY1 2016 at all PEGs, up 13 % compared to HY1 2015.

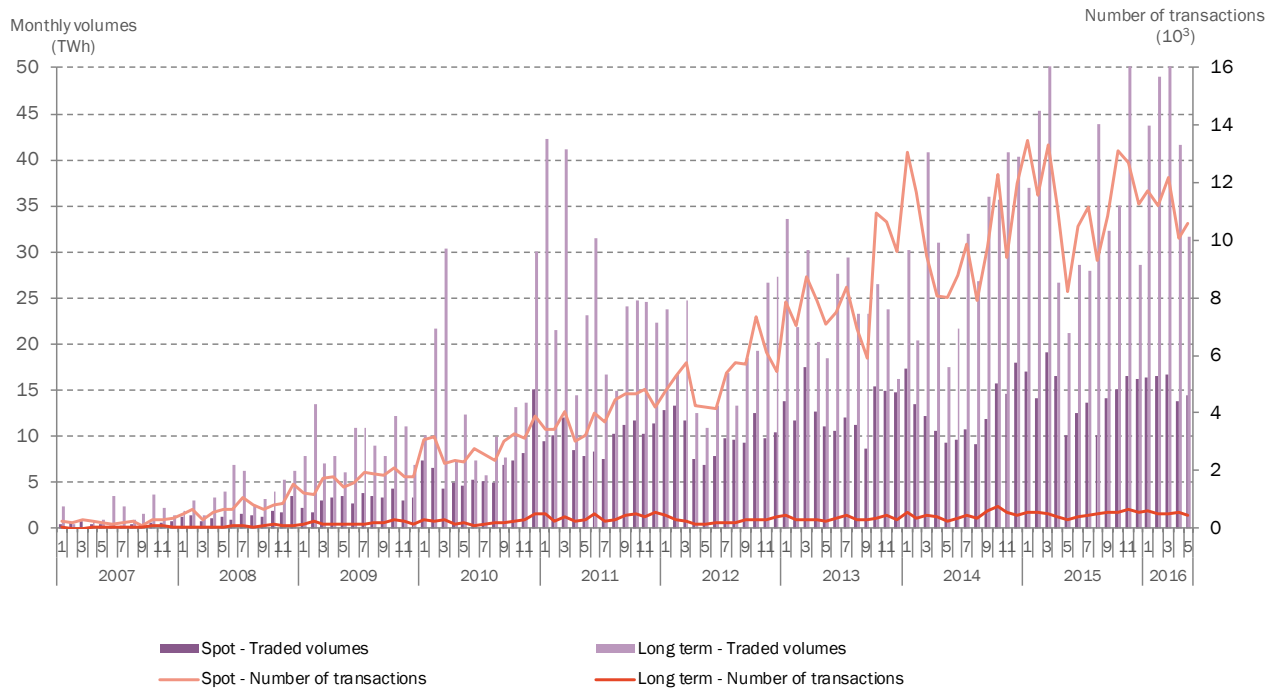
3.2 Growth in spot and forward trading in 2015

Activity in the French brokered and organised markets grew sharply in 2015 with global volumes up 15 % compared to 2014 and the number of transactions up 13 %. However, for the forward markets, these figures are very different according to product. There was major growth in annual and quarterly products, up 282 % and 33 % respectively, compared to a 11 % drop in seasonal products.

In the first half of 2016, activity in French brokered and organised markets continued its growth, at a slower pace, with volumes traded up 3 % compared to HY1 2015 despite a 3 % drop in the number of transactions. Similarly in 2015, the trends seen per maturity are different with major growth in long-term product activity but with growth in spot products remaining stable (Graph 49).

In 2014, for the first time since the opening up of the markets, volumes traded were higher than consumption. The year 2015 continued this trend with a traded volume/consumption ratio of 1.24 compared to 1.16 in 2014. This increase is due to growth in brokered and organised trading (+15 %) that was faster than consumption (+8 %). This upward trend continued in HY1 2016 with an increase in this ratio to 1.24 compared to 1.11 for HY1 2015.

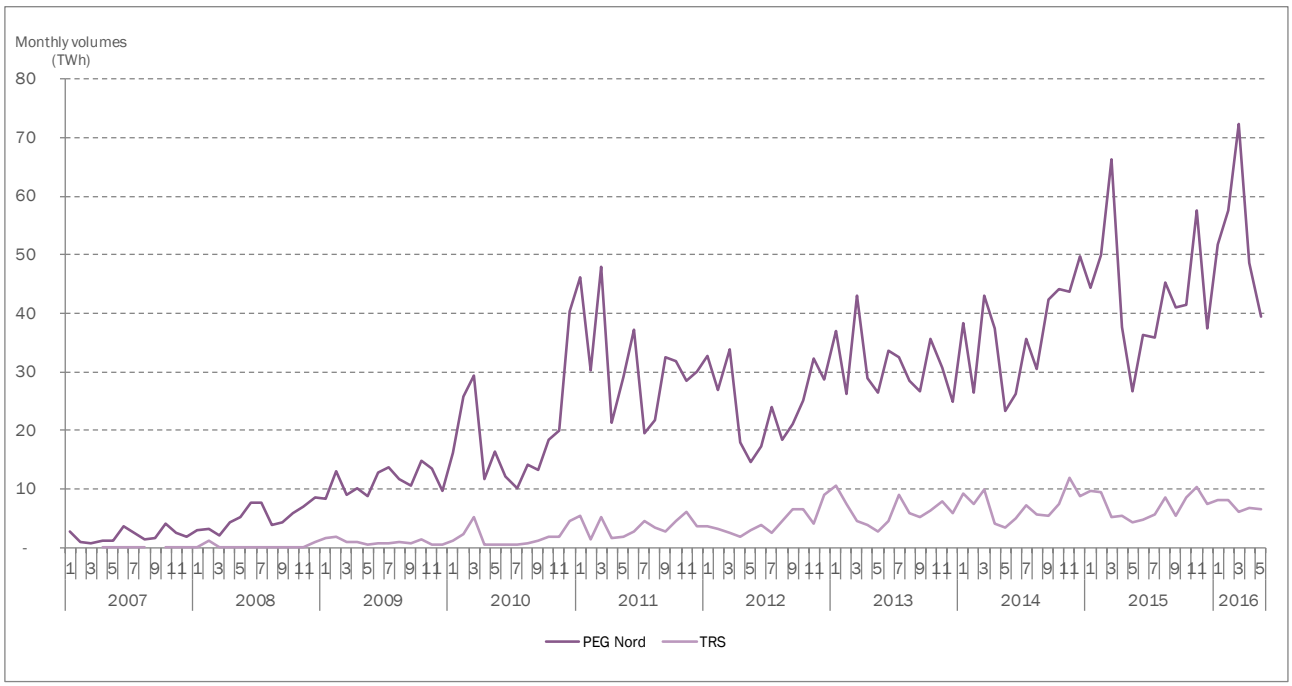
Graph 49: Evolution of volumes traded and of the number of transactions in the French brokered and organised markets



Sources: Powernext, Brokers – Analysis: CRE

The growth in volume occurred exclusively at the PEG Nord, with an 18 % increase traded in 2015 compared to 2014 and an increase by only 0.22 % for the TRS.

Graph 50: Volumes traded per PEG in the brokered and organised markets

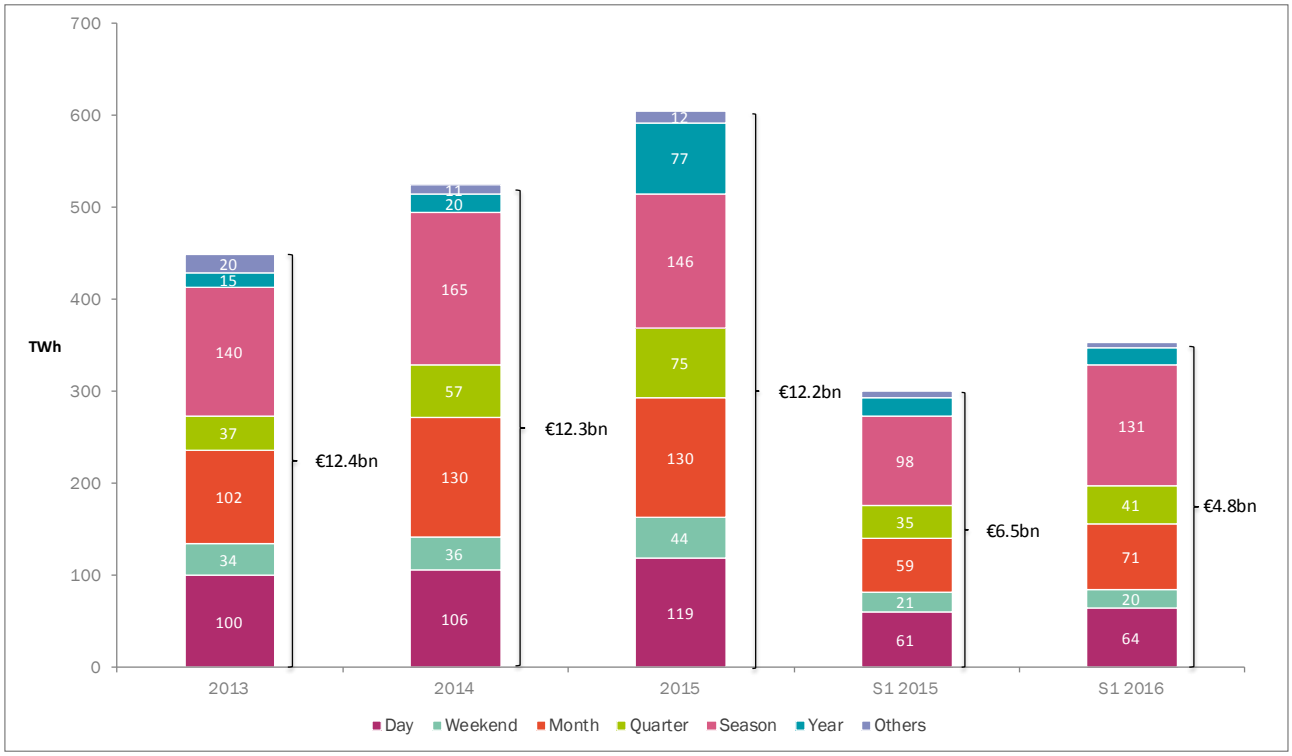


Sources: Powernext, brokers – Analysis: CRE

The increase in volumes traded in 2015 was significant in particular for annual and quarterly products which saw about a 282 % and 33 % growth respectively (Graph 52). Despite an increase in volumes traded in the French brokered and organised markets in 2015, the drop in wholesale gas prices resulted in a value drop of -1.5 % for these trades. This drop in value was particularly sharp in the first half of 2016 at -25 %.

In the first half of 2016, the trend continued with a general increase in volumes traded, in particular with a pickup in seasonal and monthly timeframes (Graph 51).

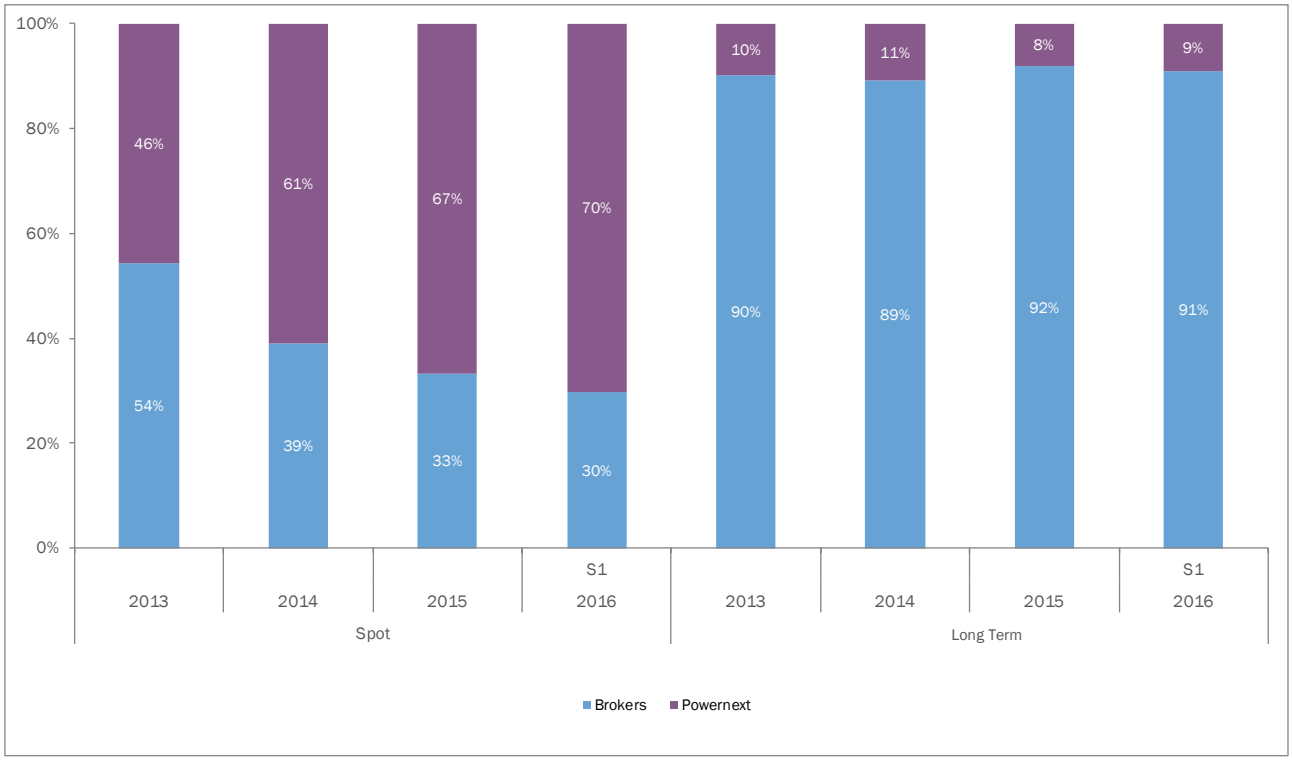
Graph 51: Volumes traded in the French brokered and organised markets



Sources: Powernext, brokers – Analysis: CRE

The Powernext exchange continued its growth in volume (+14 %), mainly in the spot market (+26 %) (Graph 52), and heavily diversified its offer in 2015 and HY1 2016, particularly with the launch of products in new markets (ZTP, ZEE, PSV, NBP, etc.) and the creation of a new non-MTF platform in July 2016. However, in the futures segment, its activity slowed down (-13 %) while broker market share increased with volume up 19 %. Broker activity in the spot market was stable with a 2 % drop in volumes traded.

Graph 52: Distribution of spot and futures volumes traded by type of intermediary



Sources: Powernext, brokers – Analysis: CRE

3.3 Stability of competition indices in 2015

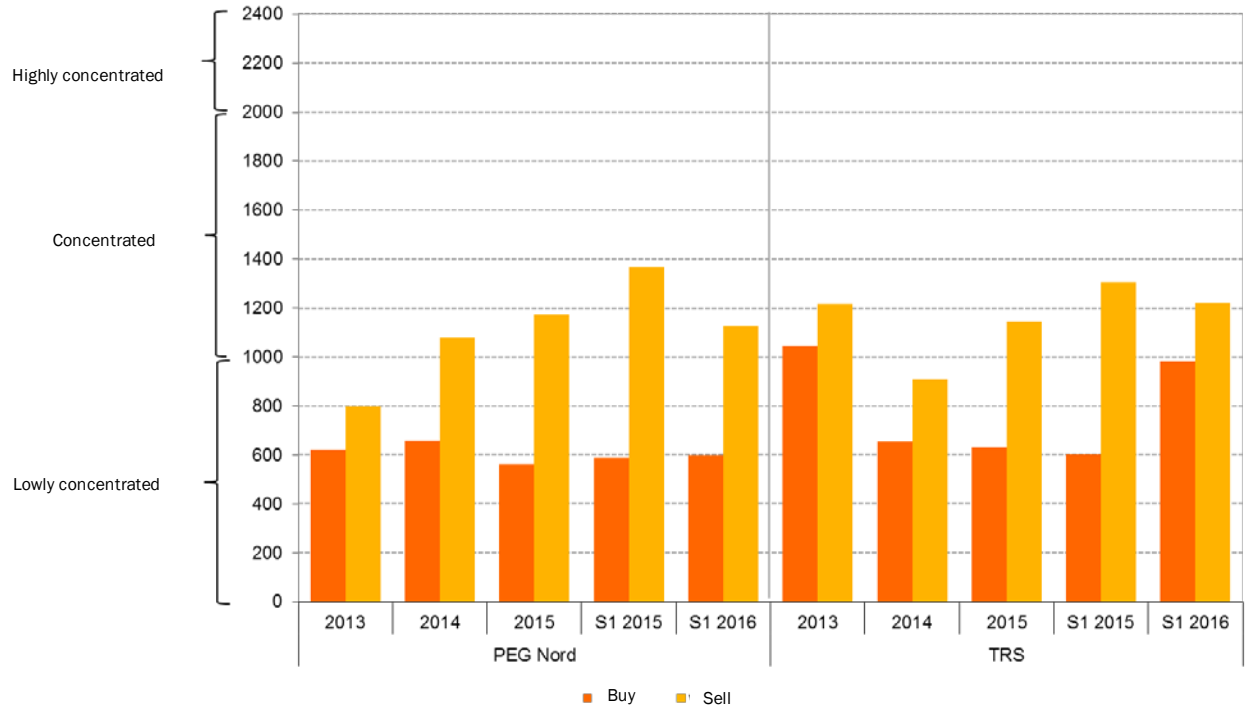
The Herfindahl-Hirschman (HHI) index measures the level of market concentration and is an indicator of its liquidity and development.

The HHI indices of the wholesale gas market in France (Graph 53 and Graph 54) are characteristic of a moderately concentrated market. Concentration levels are similar in the spot segment and the futures market for the north and south marketplaces, however with concentration in the TRS in HY1 2016 higher, from a purchase perspective, in the spot segment and higher, from a sale perspective, in the futures market.

Since 2014, concentration in the short-term segment of the north and south marketplaces has been equivalent, which marks a net change compared to previous years. Moreover, concentration in both markets differs greatly between purchases and sales with very low levels of concentration for purchases and average levels for sales. Nevertheless, the level of concentration for purchases in the TRS increased considerably in HY1 2016.

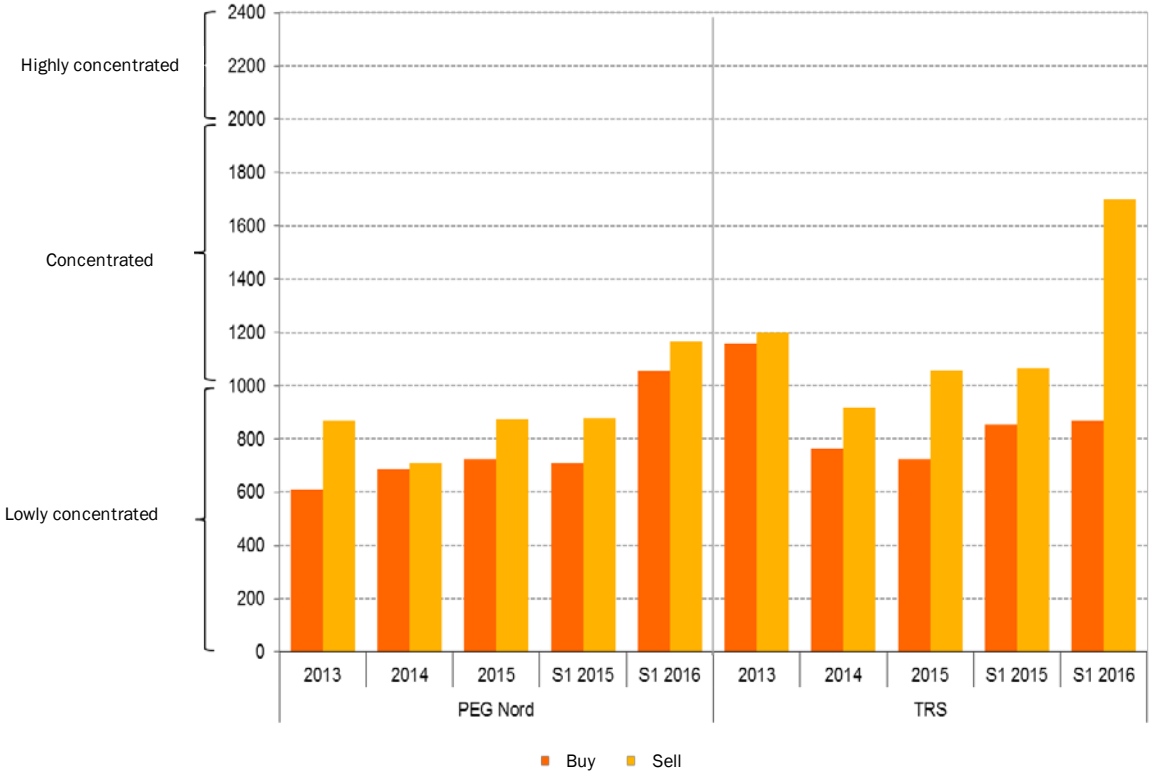
In the forward market, the index remained at a low concentration level at the PEG Nord in 2015 and was up slightly in HY1 2016. In the TRS, after reaching concentration levels similar to those at the PEG Nord in 2015, concentration was considerably higher for sales in HY1 2016.

Graph 53: Concentration indices for the French brokered and organised markets (spot market)



Sources: Powernext, brokers – CRE Analysis

Graph 54: Concentration indices for the French brokered and organised markets (futures market)



Sources: Powernext, brokers – Analysis: CRE

The number of participants present in the French market continued to grow in 2015 but dropped sharply in HY1 2016 (Table 18). The number of shippers present at interconnections and transport/distribution interface points (PITDs) followed the same pace. The number of participants present at the transport/storage interface points (PITS) and PITD remained stable in 2015 and in HY1 2016.

In the LNG terminal market, there have been only two active participants since 2013 (Table 19).

Table 18: Number of participants active in the French market

	2011	2012	2013	2014	2015	HY 2016
PEG	66	68	75	87	92	83
PIR	47	46	46	52	56	46
PITD	25	28	26	33	33	34
PITS	37	38	27	39	38	38
LNG terminals	6	5	2	2	2	2

Sources: GRTgaz, TIGF – Analysis: CRE

Table 19: Number of active participants that imported volumes via LNG terminals

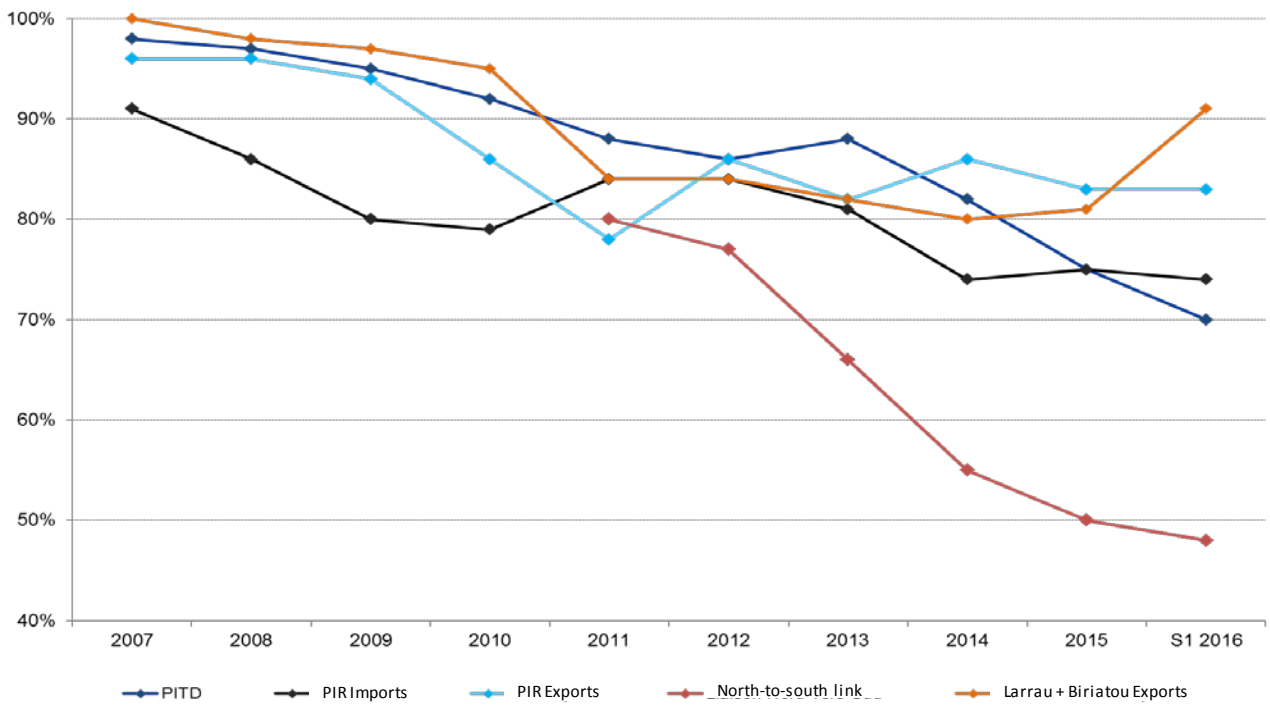
	2010	2011	2012	2013	2014	2015	S1 2016
Montoir	6	4	2	1	1	1	1
Fos Tonkin	2	2	2	1	1	1	1
Fos Cavaou	2	3	3	2	2	2	2
Total	7	6	5	2	2	2	2

Sources: Elengy, Fosmax LNG – Analysis: CRE

Apart from the north-south link, market share of the three main participants as regards the use of infrastructure remains high (Graph 55). After following a downward trend since 2007, the share of the three main participants in nominations at interconnections (PIRs) levelled off at around 75 % for exports, and 85 % for imports. Nevertheless, at the PITDs, interface points with the distribution networks, it continued the drop started in 2007 despite a slight recovery in 2013, which shows the impact of the opening up of the market and increased competition among suppliers to end customers.

At the north-south link, after a quick fall in the share of the three main participants in 2013 and 2014, due in particular to very high demand caused by tightness in the south zone, market share dropped only slightly in 2015 and HY1 2016.

Graph 55: Aggregated market share of the three main participants calculated based on nominations at the different infrastructure



Sources: GRTgaz, TIGF – Analysis: CRE

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