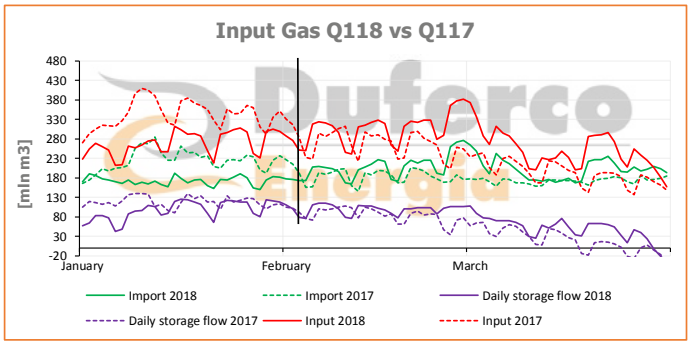
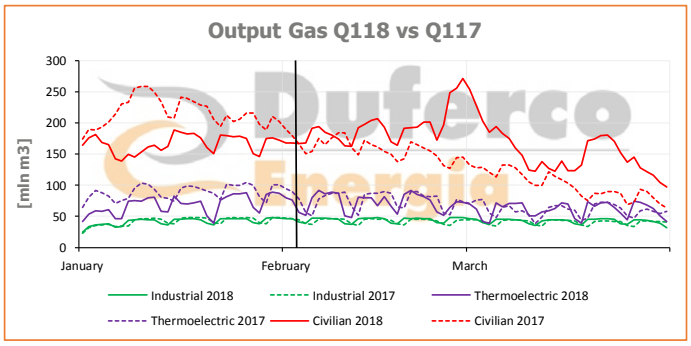
DER 100
Duferco Energy Report
April 10th, 2018 | WK.14 n. 100

Duferco Energia

1. THE ENERGY CONTEXT

Closing of the quarter.
Q1 is over and, with it, winter and (hopefully!) cold weather. The beginning of the summer semester also marks the transition to the new thermal year and the beginning of gas injection into the warehouses.

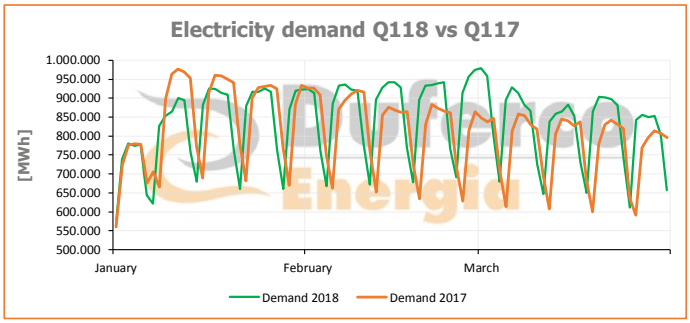




Comparing input and output of the Italian gas network for the first quarter of the current year with the data for 2017, the peculiarity of the month of January 2018 is immediately noticeable. The input at the beginning of the year was much lower than in January 2017, mainly due to a drop in imports that was caused by a reduced demand for civilian heating. The vertical line in the graphs shows the approximate moment when both input and output of the first quarter of 2018 have exceeded those of 2017. As you can see, it was mainly the civilian demand that shifted the balance during the month of January, influenced by the temperatures which were also responsible for 're-balancing' the situation in the following two months.
As a matter of fact, looking at the overall data there are no major discrepancies between Q117 and Q118, despite a very different beginning of the year:

	Input [mln m3]	Output [mln m3]
Q117	24.186	24.889
Q118	24.669	25.240

In Q118 compared to Q117, input and output increased by approx. 2% and 1.5% respectively. Having a closer look at the month of March, two peaks in demand are visible at the beginning and in the second half of the month, because of the lower temperatures. In response, warehouses triggered significantly higher supply flows compared to the same period of 2017, also due to an increase in imports, which caused the market tension we have already mentioned in previous DERs.
As far as power is concerned, in the month of March the PUN (average purchase price) was at 56.91€/MWh, around 12.5€/MWh higher than in March 2017. As for gas prices, the main cause was the anomalous cold which characterized the whole month and also supported the demand for electricity, as seen in the graph.



At some point the electricity demand curves for Q118 and for Q117 start to intersect, in a very similar period to the inversion already identified for gas. However, the total quarterly demand is also comparable to last year's, with significant deviations mainly visible in the month of March:

[MWh]	January	February	March	Total
2017	25.951.080	23.121.959	24.082.847	73.155.886
2018	25.357.046	24.342.951	25.611.813	75.311.810
2018 vs 2017	-2,29%	5,28%	6,35%	2,95%

Looking at the near future, the expected mild temperatures could open up new opportunities in terms of purchase prices, considering the close connection between temperatures and prices over the last few months. In addition, we must take into account the potential of hydroelectric production that will flow into the network in the coming spring months, thanks to abundant winter snowfalls and recent rains which filled in the basins. As usual for long-term products, let's keep an eye on the Brent trend.

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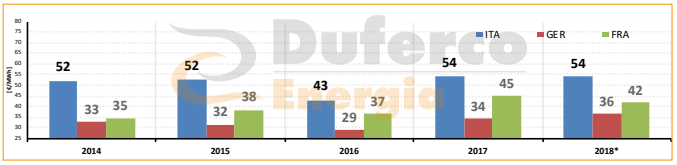
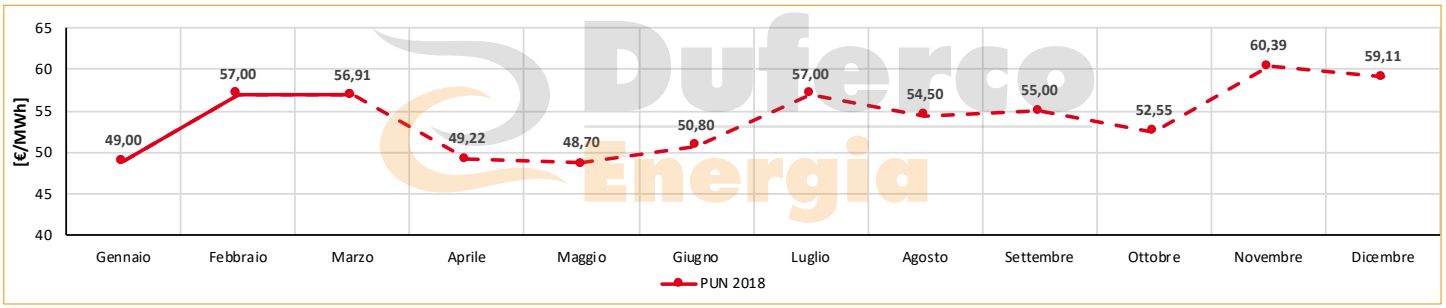
2. POWER IN SUMMARY

		2014	2015	2016	2017	2018*
Spot Power Market		52,08	52,31	42,78	53,95	54,16
		32,76	31,63	29,98	34,19	36,39
		34,63	38,48	36,74	44,96	41,76

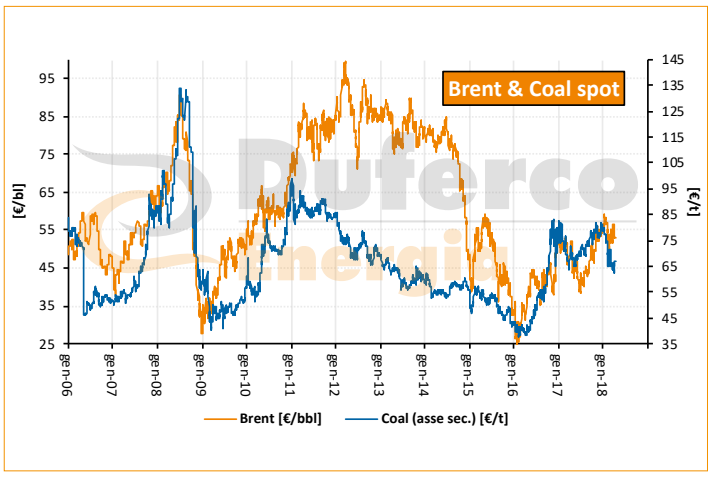


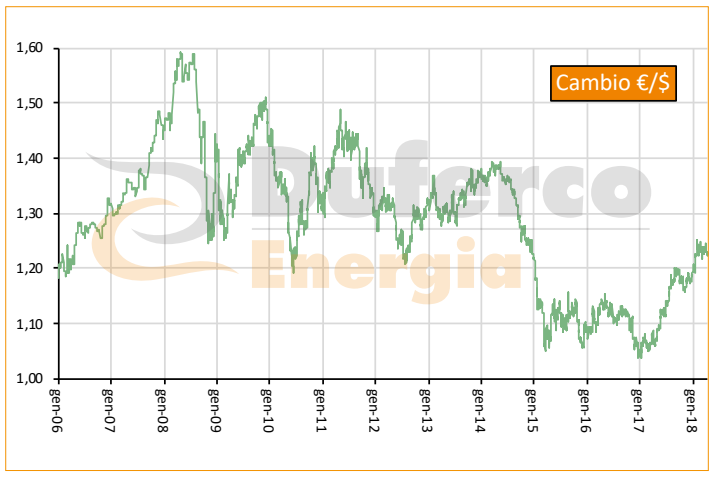


		2014	2015	2016	2017	2018*
Spread Spot Power	Spread ITA-GER	19,31	20,68	13,79	19,76	17,77
	Spread ITA-FRA	17,45	13,83	6,03	8,99	12,40

	Country	Product	€/MWh	Weekly variation
OTC Power Market		Cal19	50,40	-0,40% ↘
		Cal20	47,65	-0,03% ↘
		Cal21		
		Cal19	36,35	+0,31% ↗
		Cal20	35,50	+0,39% ↗
		Cal21		
		Cal19	41,20	+0,12% ↗
		Cal20	40,30	-0,25% ↘
		Cal21		

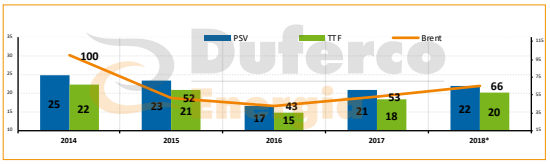
Spread OTC Power		
ITA-GER		
Cal19	14,05 €/MWh	-2,17% ↘↘
Cal20	12,15 €/MWh	-1,21% ↘↘
Cal21		
ITA-FRA		
Cal19	9,20 €/MWh	-2,64% ↘↘
Cal20	7,35 €/MWh	+1,20% ↗↘
Cal21		

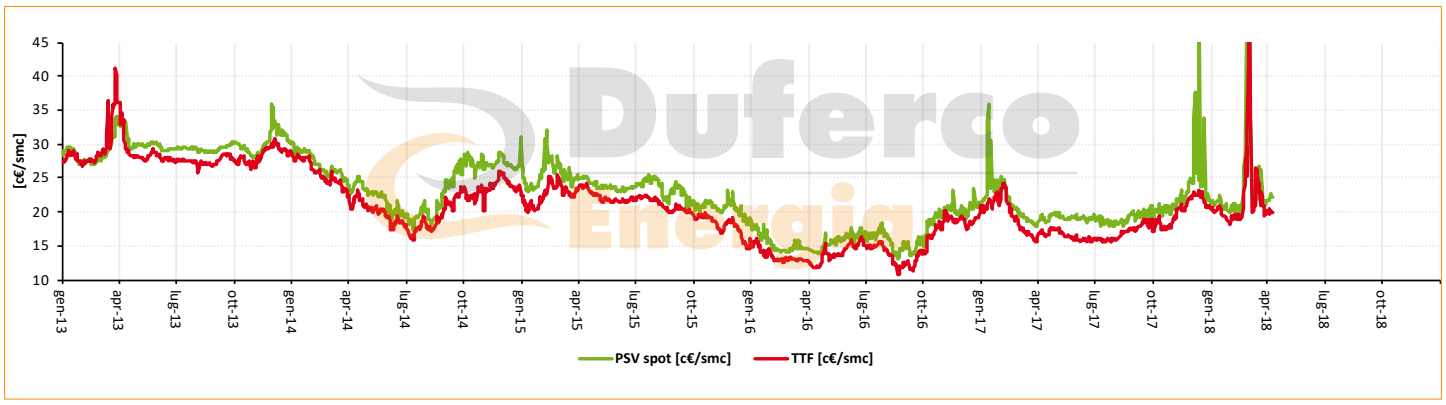




3. GAS IN SUMMARY

		2014	2015	2016	2017	2018*
Spot Gas & Oil Markets	PSV [c€/Smc]	24,62	23,41	16,61	20,49	22,02
	TFF [c€/Smc]	22,15	20,93	14,78	18,26	20,20
	Brent [$/bbl]	99,59	52,22	43,33	53,23	65,61

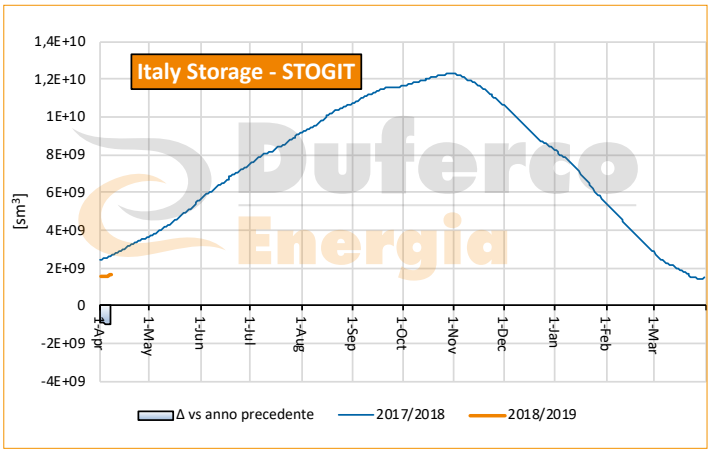


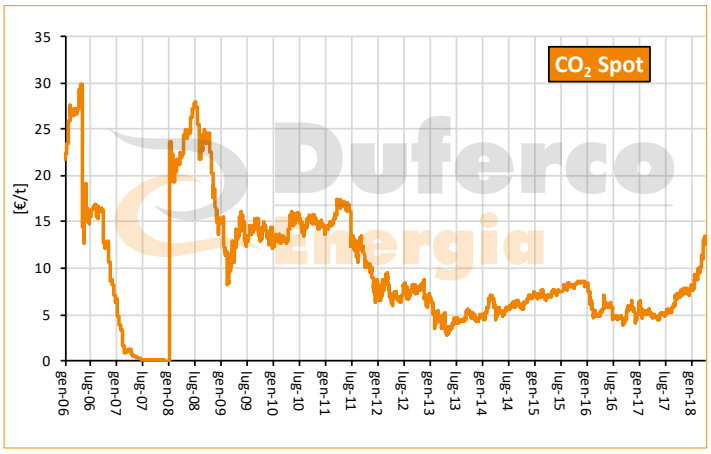


		2014	2015	2016	2017	2018*
Spread Spot Gas	Spread PSV-TTF [c€/smc]	2,47	2,48	1,83	2,24	1,83
	Spark Spread [€/MWh]	-0,03	2,76	7,63	10,58	7,54

		Product	c€/smc	Weekly variation
OTC Gas Markets	PSV	Cal19	20,43	-0,06% ↘
		Cal20	19,31	-0,14% ↘
		Cal21		
	TTF	Cal19	18,41	-0,07% ↘
		Cal20	17,46	-0,15% ↘
		Cal21		

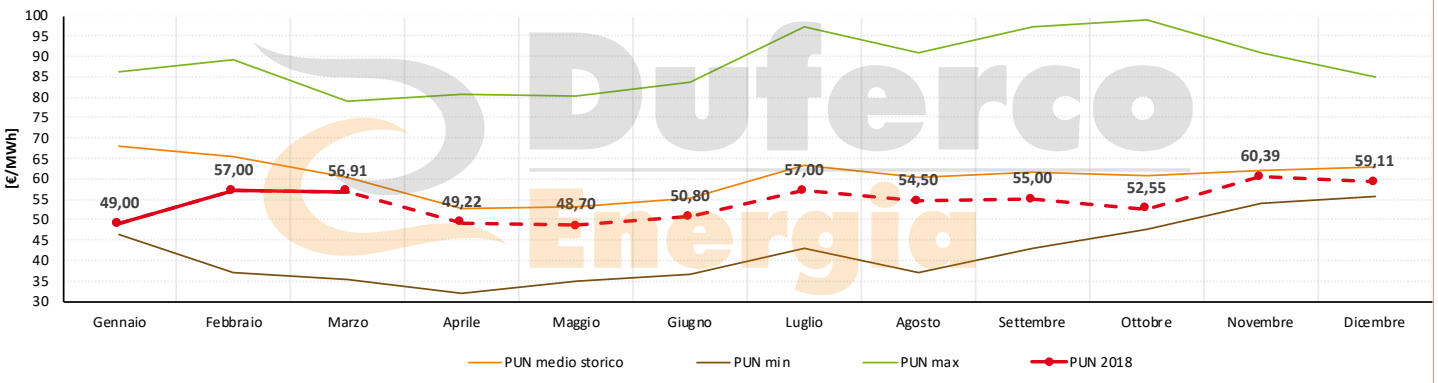
Spread PSV-TTF		
Cal19	2,01 c€/smc	-0,00% ↘↗
Cal20	1,85 c€/smc	-0,00% ↗↘
Cal21		





4. POWER MARKETS

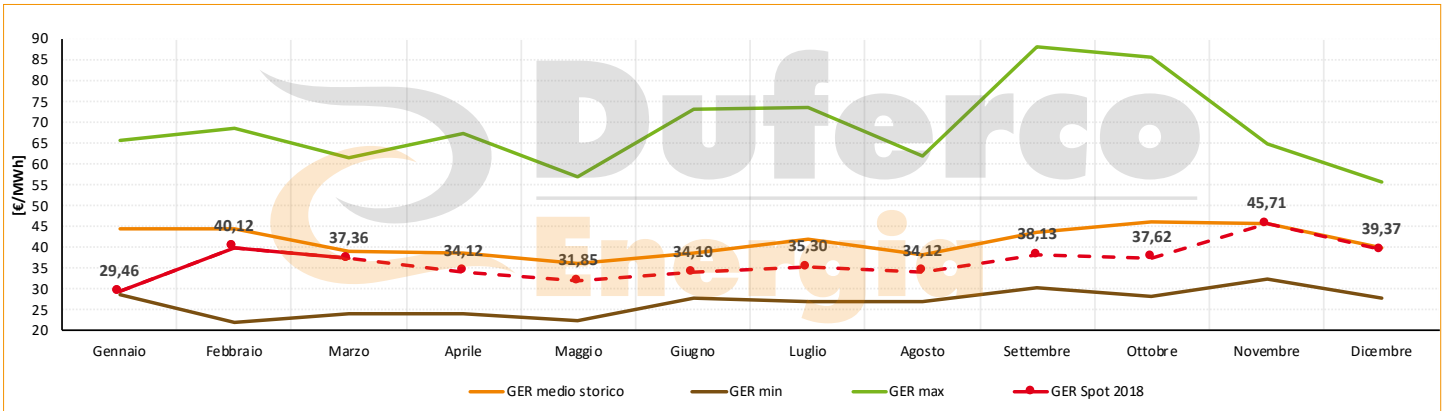
POWER ITALY - SPOT



PUN min: is the minimum monthly average value of each month from 2004 to 2017
PUN max: is the maximum monthly average value of each month from 2004 to 2017

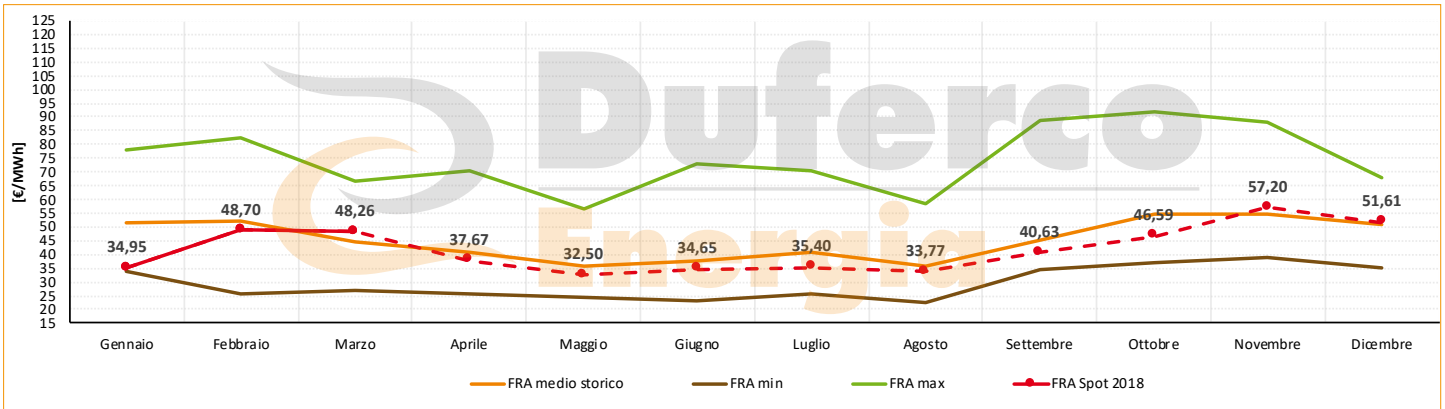
The first week of the month closed at 51.8 €/MWh slighty above last deals of April product, which settled at 49.5 €/MWh the last day of liquidity. Next weeks are expected to have a decrease thanks to mild temperature and the shutdown of heating in climate zone D and E (April 15, 2018).

POWER GERMANY - SPOT



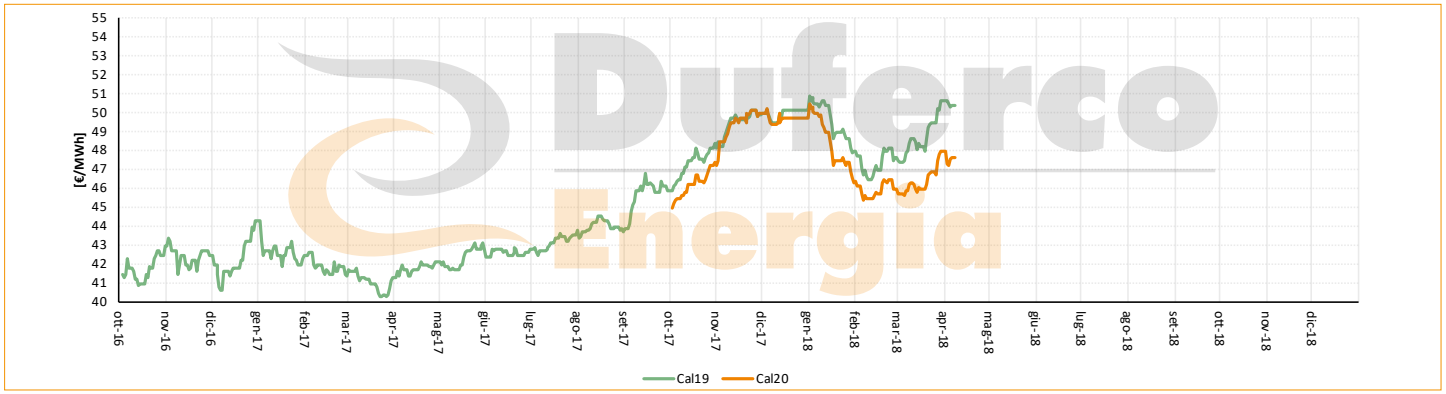
GER min: is the minimum monthly average value of each month from 2004 to 2017
GER max: is the maximum monthly average value of each month from 2004 to 2017

POWER FRANCE - SPOT



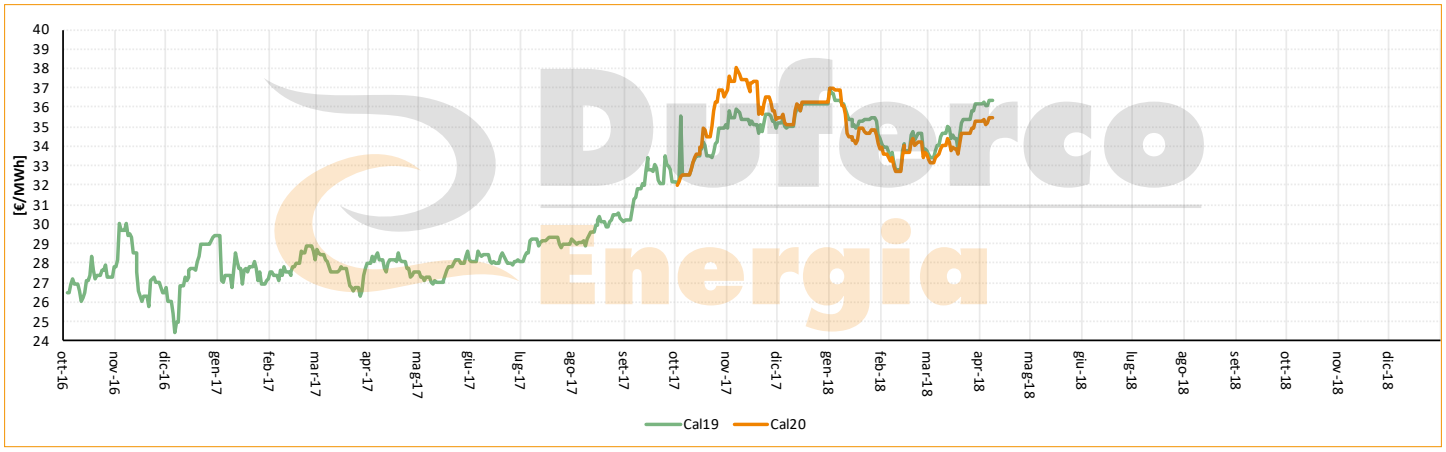
FRA min: is the minimum monthly average value of each month from 2004 to 2017
FRA max: is the maximum monthly average value of each month from 2004 to 2017

POWER ITALY - FORWARD

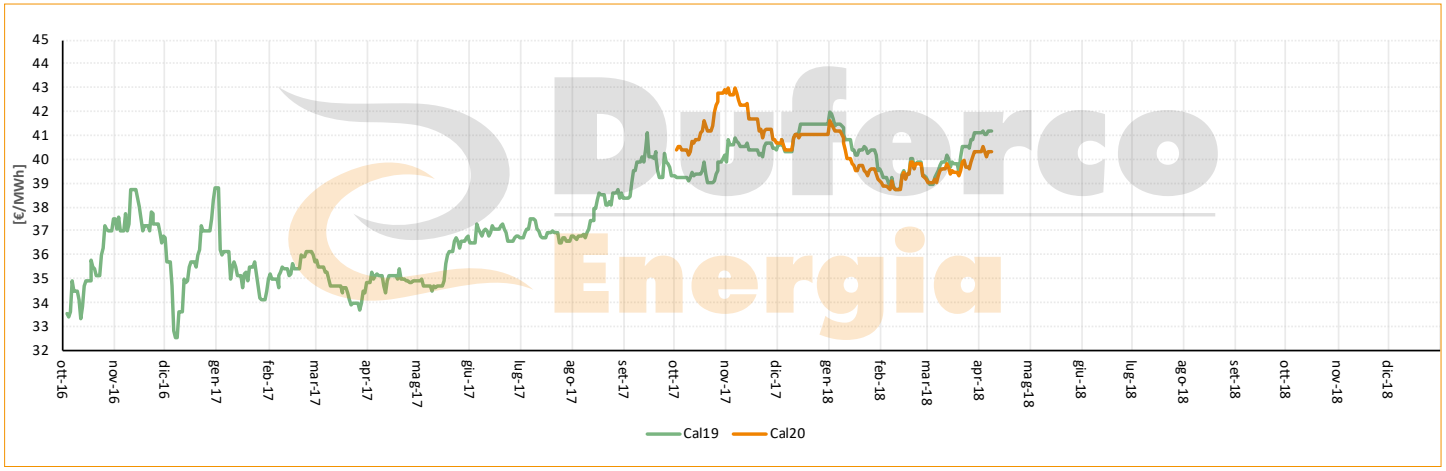


A sharp up-trend is continuing from the middle of February due to lots of drivers that are still strong (i.e. gas that doesn't show signs of drop, temperatures are still cold for the period).

POWER GERMANY - FORWARD

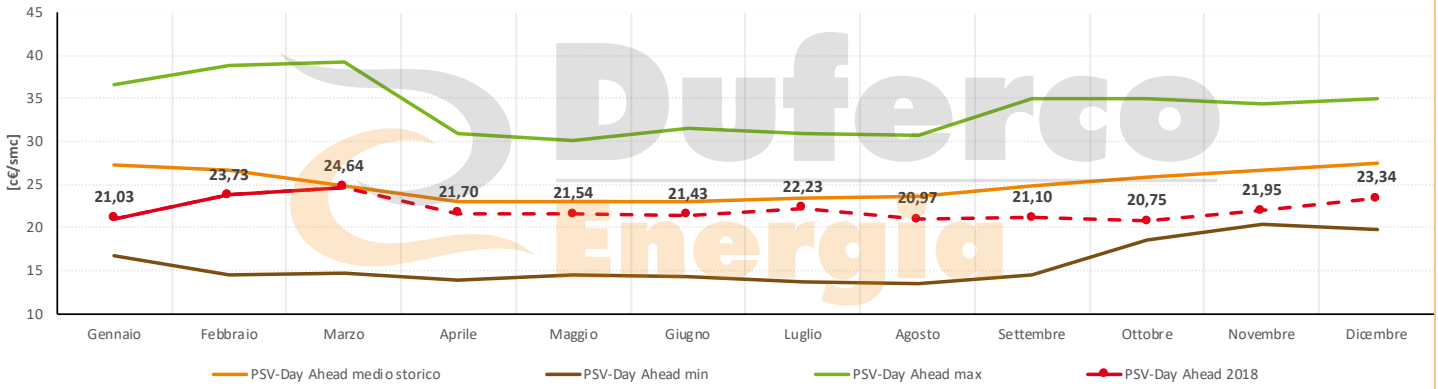


POWER FRANCE - FORWARD



5. GAS MARKETS

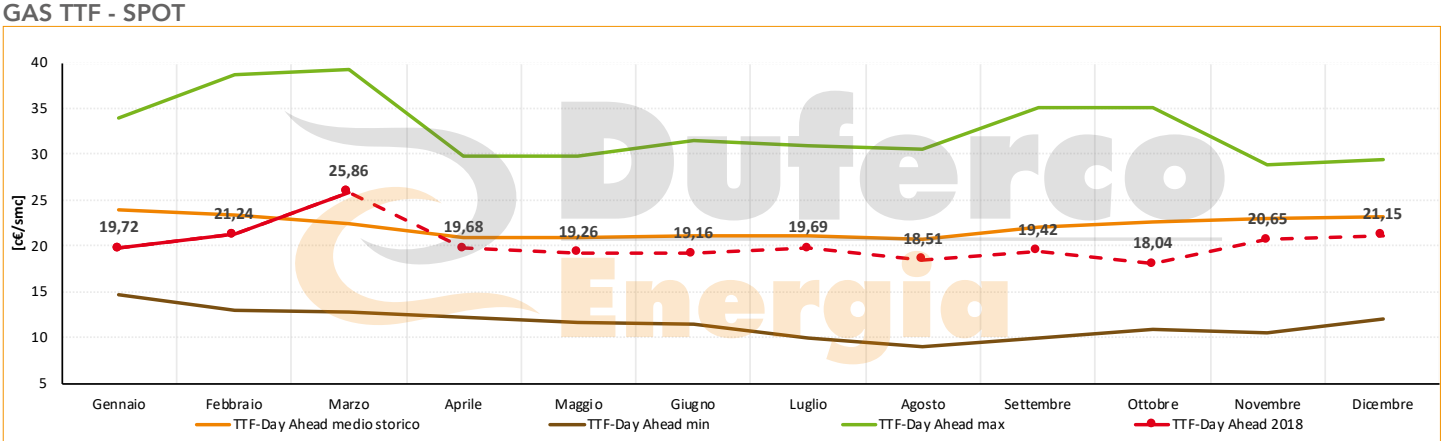
GAS ITALY - SPOT



PSV-Day Ahead min: is the minimum monthly average value of each month from 2004 to 2017
PSV-Day Ahead max: is the maximum monthly average value of each month from 2004 to 2017

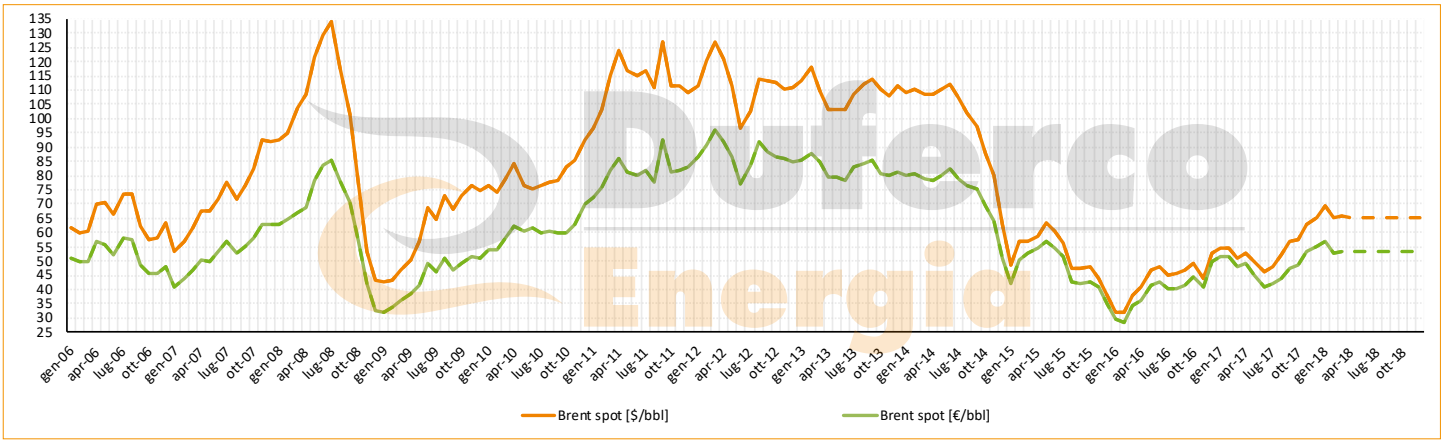
The winter phase of withdrawal ended in March and the month closed at 23.8 €/MWh (with some spikes at the beginning of the month) while April, to date, is almost at 21 €/MWh (week end included). We're very far from 18 €/MWh of April 17, but boundary conditions have changed, firstly CO2 that almost tripled.

GAS TTF - SPOT

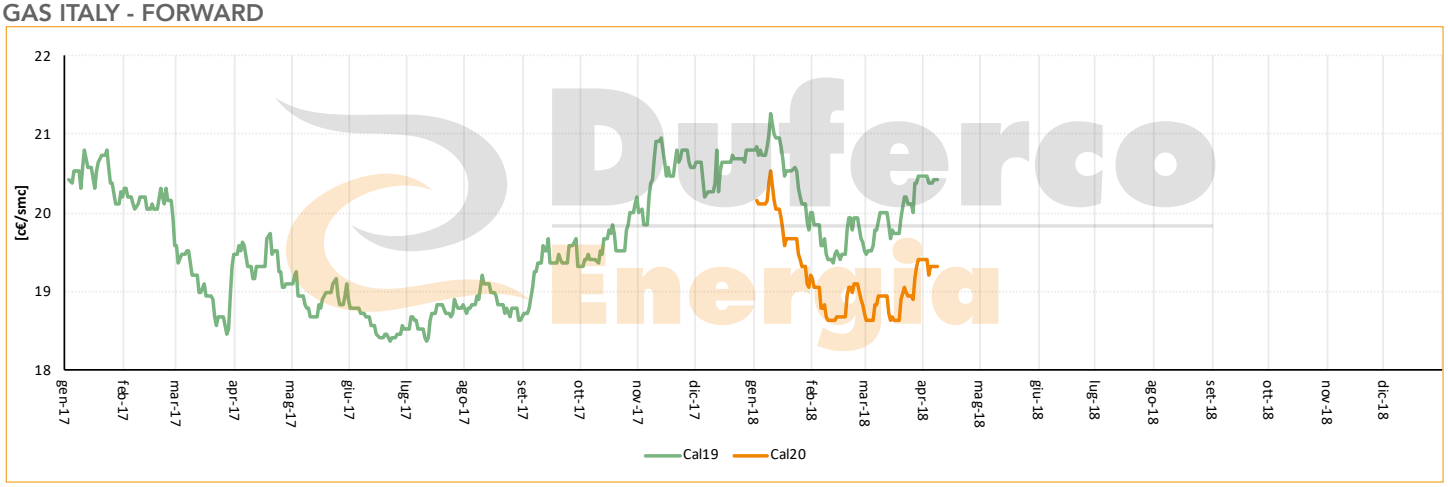


TTF-Day Ahead min: is the minimum monthly average value of each month from 2004 to 2017
TTF-Day Ahead max: is the maximum monthly average value of each month from 2004 to 2017

BRENT - SPOT

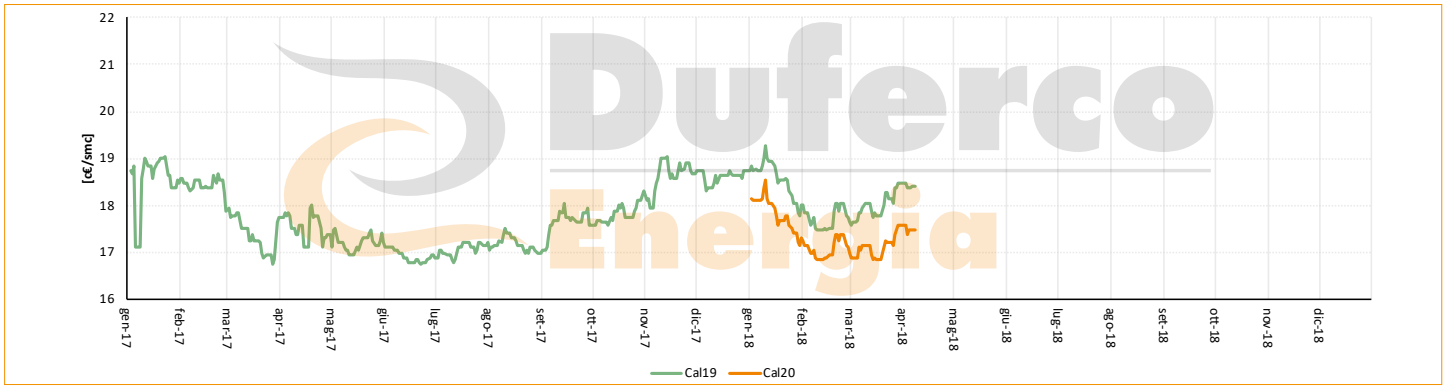


GAS ITALY - FORWARD

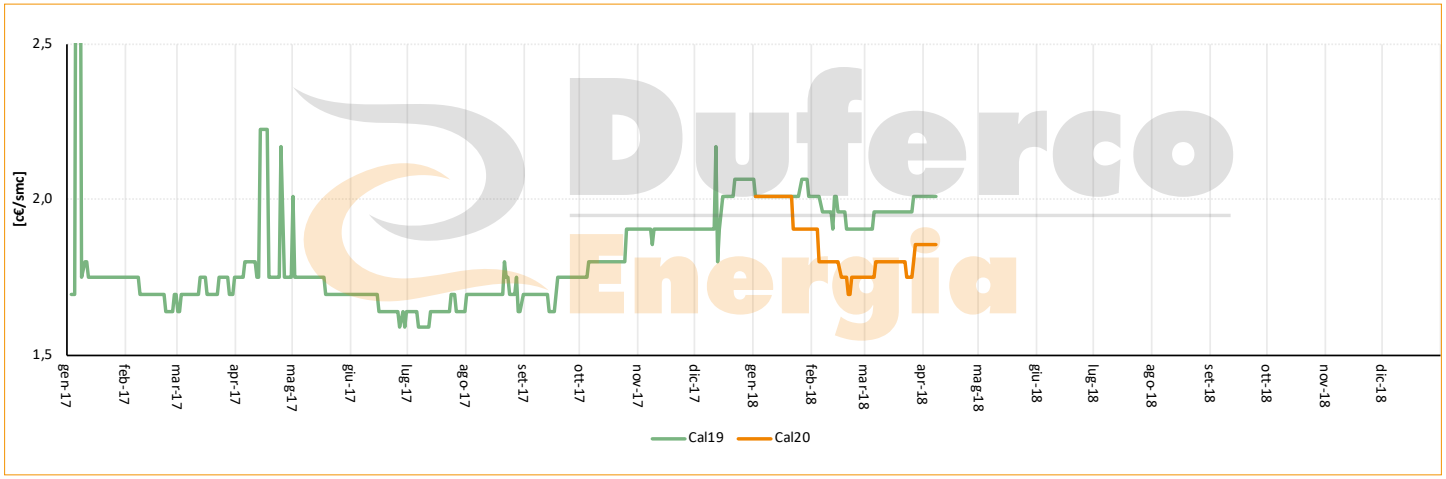


Gas rises rapidly on Cal 19, more slowly on Cal 20, making spread year to year wider and wider. Spread PSV – TTF Cal remain steady at 1.9 €/MWh.

GAS TTF - FORWARD

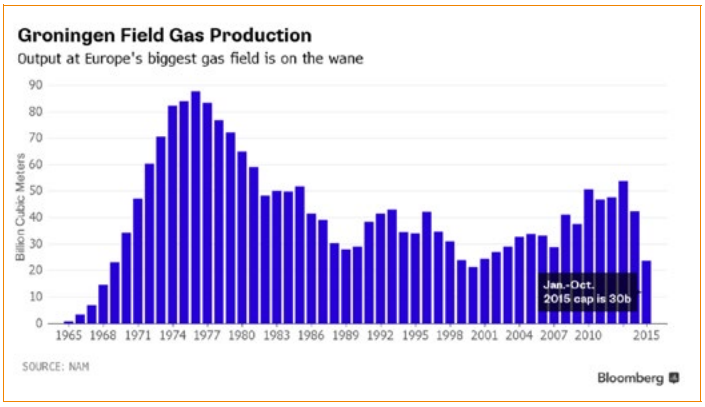


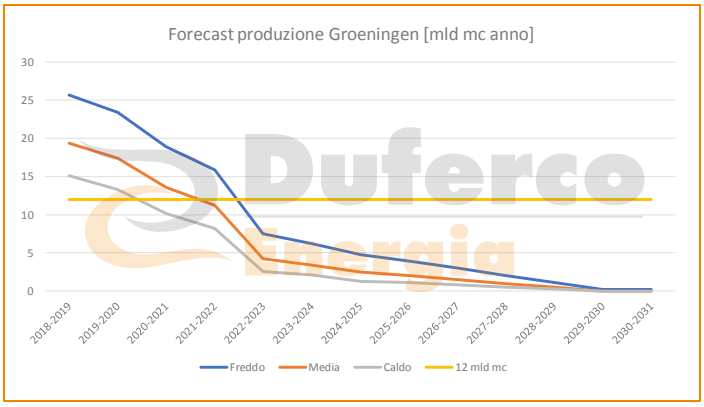
GAS SPREAD PSV/TTF - FORWARD



6. FOCUS

Goodbye Groeningen.
In the end it will be closed. The largest gasfield in Europe, which once covered up to 10% of the European demand of gas, will eventually be brought to zero production by 2030 at the latest, because of a series of seismic events (the latest was recorded in January with a magnitude of 3.4) and the end of public acceptance for these risks, which had already led to several reductions over the last few years.
The Dutch government made the announcement on Thursday, the 29th of March. This is the very last decision after years of steady decline, which had caused the production to be cut in half compared to the almost 54 billion cubic meters of 2013.
In particular, the Minister for Economic Affairs, Eric Wiebes, has predicted that production will fall from the current 21.6 bln m3/year to 19.3, starting from the next thermal year (2018/19). Then to 17.5 in GY 2019/20; 13.5 in 2020/21, 12 in 2022, down to 0 by 2030.





In the meantime, however, the latest EU Commission report on the European gas market underlined that in 2017 the EU gas demand corresponded to 491 bln m3, ie it increased by 6% compared to 2016 and reached the highest level since 2010.
In 2017 Groeningen was covering around 4.5% of EU demand and, with an equal demand, the decline to 19.3 bln m3 next year would mean a reduction of less than 0.5% compared to the needs. Judging from the TTF CAL19 and GY18/19 listings, markets are not concerned for 2019, considering that the percentage is all in all limited, but this reduction surely fuels the already quite tense future of gas.

7. WHAT DOES ENERGY HAVE TO DO WITH IT?

Mother Nature's patent.
Days are longer, temperatures are milder and nature is awakening. It is the perfect time to organize a refreshing walk in the forest and be surrounded by... thousands of precursors of modern photo-voltaic panels! As a matter of fact, since 2.5 billion years plants use solar energy through the chlorophyll photosynthesis, a process upon which life on our planet depends. The amount of energy captured by plants is huge and, most importantly, free.
At the beginning of last century, Giacomo Cimician, a scientist and professor at the University of Bologna, was among the first to wonder why we do not exploit this immense energy source and, fascinated by the plants' ability to use sunlight, he laid the foundations for the so-called "artificial photosynthesis", ie the production of fuels through the conversion of solar energy.
The "Cimician's utopia" is an ongoing challenge and research to reproduce this biological process is carried out all over the world (in Italy, for example, through the PHOEBUS project entrusted to the Milan Polytechnic). The basic principle is to split water into its two components: hydrogen (the fuel) and oxygen (the oxidizer), by following this simple relation: H2O + sunlight -> H2 + 1/2 O2
The two elements are then rejoined in a combustion process or in a fuel cell, in order to produce thermal or electrical energy and again obtain water as a waste product. For the photochemical dissociation to take place, however, substances capable of absorbing sunlight and of catalyzing some of the expected reactions are needed.
They should basically replace the role of chlorophyll in the natural process. At the moment, the best (although still not efficient) catalysts are very rare and expensive metals: colloidal platinum and colloidal ruthenium oxide. The Mit (Massachusetts Institute of Technology) has managed to create "artificial leaves" from nickel and cobalt, even less efficient but cheaper elements, which would allow for the design of a power plant or... an energy forest!

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