Gas Storage and Swing Report
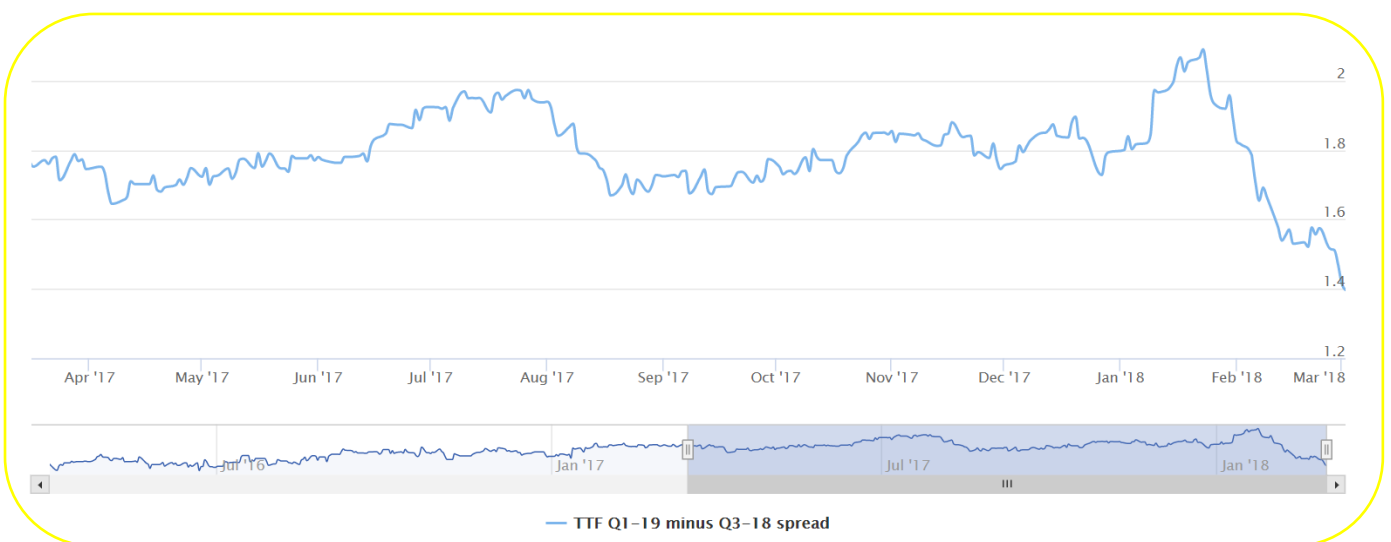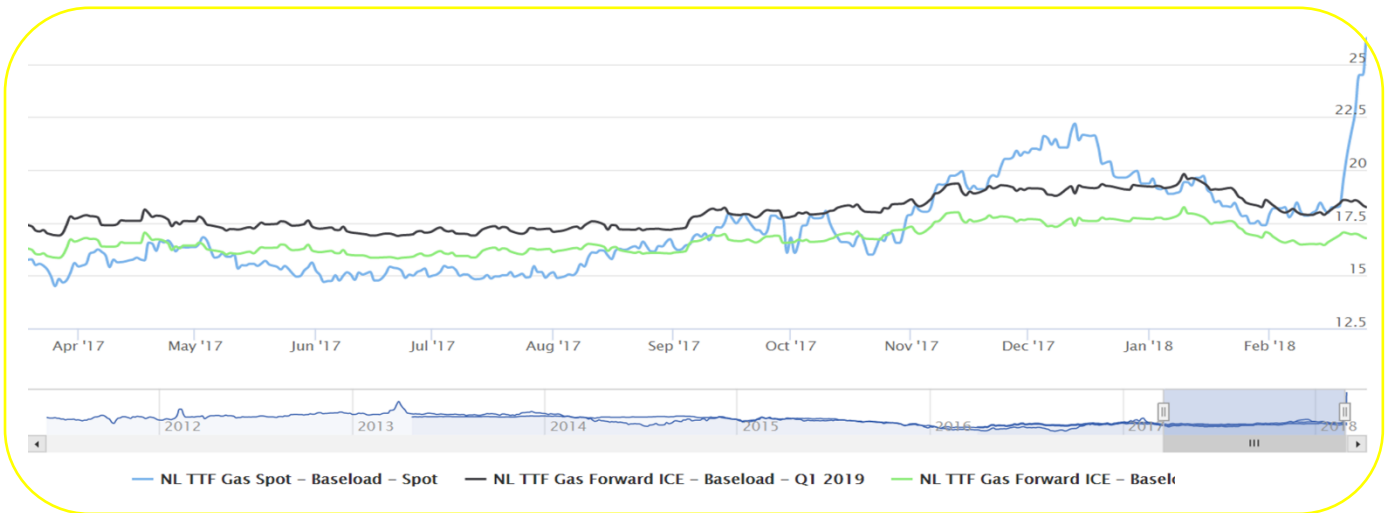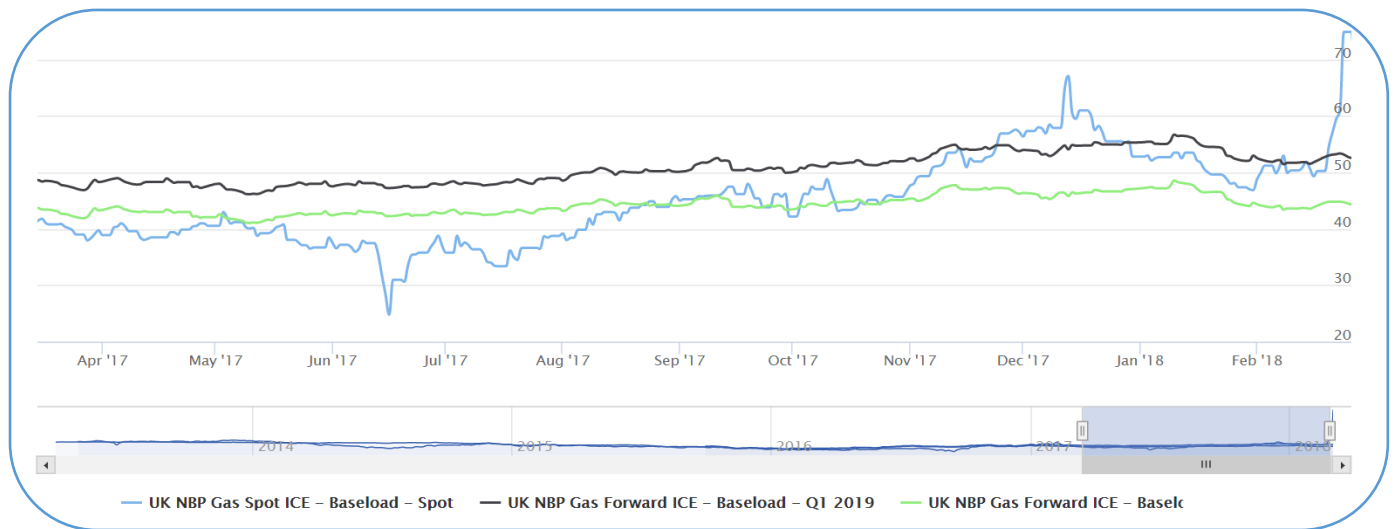
	Market	Product	Period	Cycle Cost	Intrinsic	Rolling Intrinsic		Option	
						Avg	10%	Avg	10%
Storage	TTF	30/30	SY2018	0.75	0.68 ↓	2.84 ↑	2.12 ↑	3.94 ↑	2.94 ↑
	TTF	60/60	SY2018	0.75	0.67 ↓	2.01 ↑	1.49 ↑	2.57 ↑	1.76 ↑
	TTF	60/120	SY2018	0.75	0.64 ↓	1.53 ⇔	1.15 ↓	2.03 ↑	1.32 ↓
	NBP	30/30	SY2018	1.50	10.57 ↑	21.00 ↑	17.13 ↑	23.33 ↑	19.80 ↑
	NBP	60/60	SY2018	1.50	10.13 ↓	15.50 ↑	15.17 ↑	16.78 ↑	14.47 ↑
	NBP	60/120	SY2018	1.50	9.57 ↑	13.07 ↑	11.55 ↑	14.03 ↑	12.13 ↑

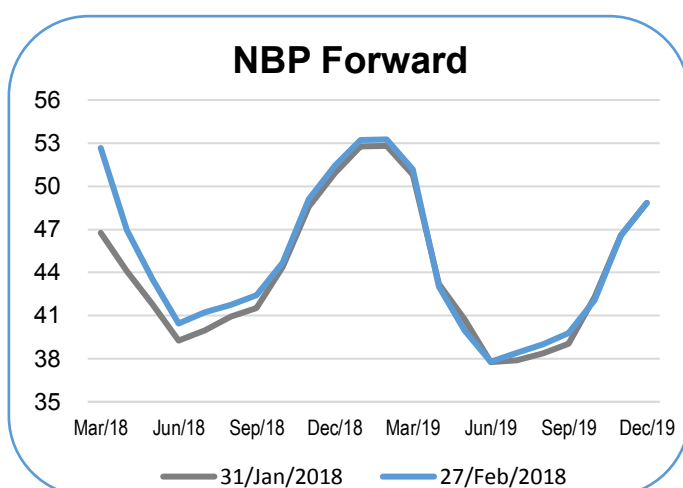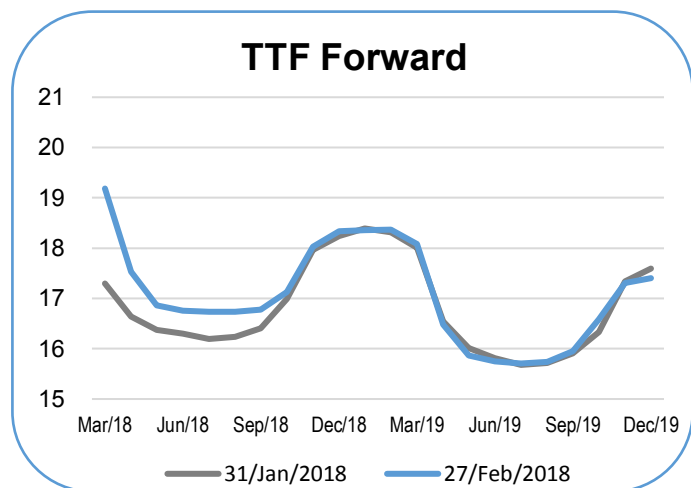|	Market	Max/day	Min/Max	Period	Price	Intrinsic	Rolling Intrinsic		Option	
							Avg	10%	Avg	10%
Swing	TTF	4	360/360	2019	18.08 ↓	-0.02 ⇔	0.21 ↑	-0.02 ⇔	0.43 ↑	-0.22 ↑
	TTF	1	0/365	2019	18.08 ↓	0.02 ↑	0.61 ↑	0.07 ↑	0.74 ↑	0.13 ↑
	TTF	4	360/360	2019	MA	0.00 ⇔	0.56 ↑	0.32 ↑	1.09 ↑	0.74 ↑
	NBP	4	360/360	2019	52.29 ↑	-0.02 ⇔	0.67 ↑	-0.02 ⇔	1.16 ↑	-0.18 ↑
	NBP	1	0/365	2019	52.29 ↑	0.10 ↑	1.48 ↑	0.25 ↑	1.56 ↑	0.44 ↑
	NBP	4	360/360	2019	MA	-0.02 ⇔	3.02 ↑	1.92 ↑	4.45 ↑	3.18 ↑

TTF Price History

— NL TTF Gas Spot – Baseload – Spot   — NL TTF Gas Forward ICE – Baseload – Q1 2019   — NL TTF Gas Forward ICE – Basel

— TTF Q1–19 minus Q3–18 spread

NBP Price History

Legend: UK NBP Gas Spot ICE – Baseload – Spot | UK NBP Gas Forward ICE – Baseload – Q1 2019 | UK NBP Gas Forward ICE – Baselo

Legend: NBP Q1-19 minus Q3-18 spread

Volatility

Market	Spot Volatility					Year-ahead Forward volatility				
	1m	3m	6m	12m	KYOS sugg.	1m	3m	6m	12m	KYOS sugg.
TTF	88% ↑	62% ↑	52% ↑	44% ↑	57% ↑	15% ↑	14% ↓	15% ↑	15% ↑	15% ⇔
NBP	117% ↑	83% ↑	68% ↑	66% ↑	75% ↑	14% ↓	15% ↓	16% ⇔	15% ⇔	15% ⇔
GPL	91% ↑	68% ↑	56% ↑	47% ↑	57% ↑	13% ↓	13% ↓	14% ⇔	14% ⇔	15% ⇔
NCG	95% ↑	69% ↑	56% ↑	48% ↑	57% ↑	15% ↑	14% ↓	14% ⇔	14% ⇔	15% ⇔
PEG-N	128% ↑	89% ↑	72% ↑	57% ↑	75% ↑	14% ↓	14% ↓	14% ⇔	14% ⇔	15% ⇔

Our analytics
Your advantage

Price Forward Curves

TTF Forward

31/Jan/2018 — 27/Feb/2018

NBP Forward

31/Jan/2018 — 27/Feb/2018

Market Trend

Gas storage

With the nearby summer getting closer to the prompt, the Q1-19 x Q3-18 spread on the TTF keeps on decreasing and lost about 0.5€/MWh during February. The intrinsic value of our storages decreased therefore considerably.

The results in this edition of the report are dominated by the cold spell that covered large parts of Europe during the last days of February and first day of March. The resulting high spot prices had an immediate effect on the spot volatility. On the NBP, our estimate of the spot volatility went up from 57% to 75%. On the TTF we see currently spot volatility at 57%, up from 37%. We have to go back to December 2016 to see comparable spot volatilities.

As a result of the big increase in spot volatility the overall storage value of all our storages went up considerably compared to last month.

Swing

The results for the swing contracts followed the same trend as observed for our storages. Due to the large increase in spot volatility at the NBP and TTF, the extrinsic value of all contracts increased which led to a higher overall value.

Explanation

Storage
• Product: 60/120 means 60 days of withdrawal and 120 days of injection capacity.
• The storage values are expressed per MWh (or therms) of working volume.

Swing

Product:
• Max/day is the maximum daily take
• Min/Max are the minimum and maximum annual take

Price
• A fixed price put at Q1-level or
• Month-ahead indexed price (MA)

The swing values are per MWh or therms of contract volume, which is 365 for the daily callable options (max 1 per day) and 360 for other contracts (max 4 per day).

Volatilities
The volatilities are derived from the end-of-day settlement prices of gas spot and futures exchanges. They are calculated with a history of 1, 3, 6 and 12 months. The 'KYOS suggested' volatilities are our expert view, considering the historical estimates as well as recent market developments. These estimates are used for the valuations.

Valuation Methodologies
• All valuations have been performed with KYOS software and models, KyStore and KySwing. They are expressed in €/MWh (TTF) or p/th (NBP). Inputs include the spot and forward volatilities from the table in this report, as well as forward curves and some other settings.
• The trading date for all values is 27 Feb 2018.
• A discount rate of 2% has been applied.
• Intrinsic values are derived from the tradable products in the market.
• Rolling intrinsic and option values are derived from Monte Carlo simulations of spot and forward prices:

   • Rolling intrinsic: the intrinsic value is locked in initially with tradable products; then this position, including spot, may be adjusted daily to capture extra value.
   • Option value: the spot trades are optimized, taking into account the optionality of the asset, based on the least-squares Monte Carlo method. In addition, the position is delta hedged in the forward market to minimize the risk.
   • Of the rolling intrinsic and option value, the table shows the average across the simulations and the 10th percentile, which is a more conservative value estimate.
   • In all trading strategies, the model takes into account transaction costs of 0.02 €/MWh (TTF) or 0.02 p/th (NBP).

Contact us for more information about the models and assumptions underlying this report, or to request a demonstration of the KYOS software.

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