

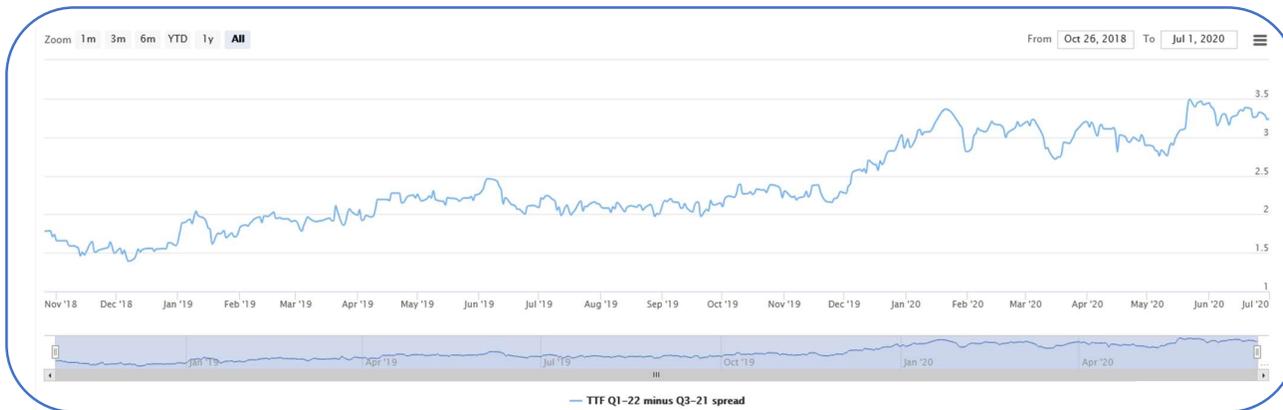


## Gas Storage and Swing Report

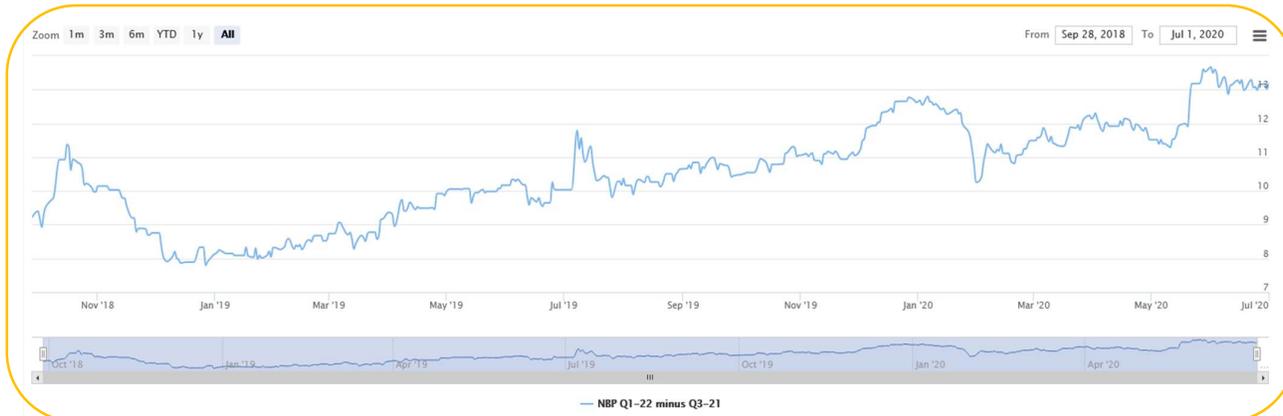
Storage	Market	Product	Period	Cycle Cost	Intrinsic	Rolling Intrinsic		Option	
						Avg	10%	Avg	10%
	TTF	30/30	SY2021	0.50	2.46 ▼	5.20 ▲	3.74 ▼	6.43 ▲	5.10 ▲
	TTF	60/60	SY2021	0.50	2.46 ▼	4.01 ▼	3.15 ▼	4.73 ▼	3.60 ▲
	TTF	60/120	SY2021	0.50	2.45 ▼	3.53 ▼	2.93 ▼	4.01 ▼	3.07 ▲
	NBP	30/30	SY2021	1.00	11.37 ▲	20.10 ▲	15.87 ▲	21.90 ▲	18.47 ▲
	NBP	60/60	SY2021	1.00	11.38 ▲	16.30 ▲	13.98 ▲	17.28 ▲	14.53 ▲
	NBP	60/120	SY2021	1.00	11.25 ▲	14.83 ▲	13.15 ▲	15.33 ▲	12.93 ▲

Swing	Market	Max/day	Min/Max	Period	Price	Intrinsic	Rolling Intrinsic		Option	
							Avg	10%	Avg	10%
	TTF	4	360/360	2021	12.55 ▲	1.47 ▲	1.79 ▲	1.53 ▲	1.83 ▲	1.51 ▲
	TTF	1	0/365	2021	12.55 ▲	0.38 ▲	1.32 ▼	0.63 ▲	1.47 ▼	0.84 ▲
	TTF	4	360/360	2021	MA	-0.02 ↔	0.55 ▲	0.26 ▲	1.14 ▲	0.80 ▲
	NBP	4	360/360	2021	37.17 ▲	1.67 ▲	3.46 ▲	2.07 ▲	3.68 ▲	2.87 ▲
	NBP	1	0/365	2021	37.17 ▲	0.47 ▲	3.00 ▼	1.24 ▲	3.17 ▼	1.59 ▲
	NBP	4	360/360	2021	MA	-0.02 ↔	2.00 ▲	1.08 ▲	3.34 ▲	2.38 ▲

### TTF Price History



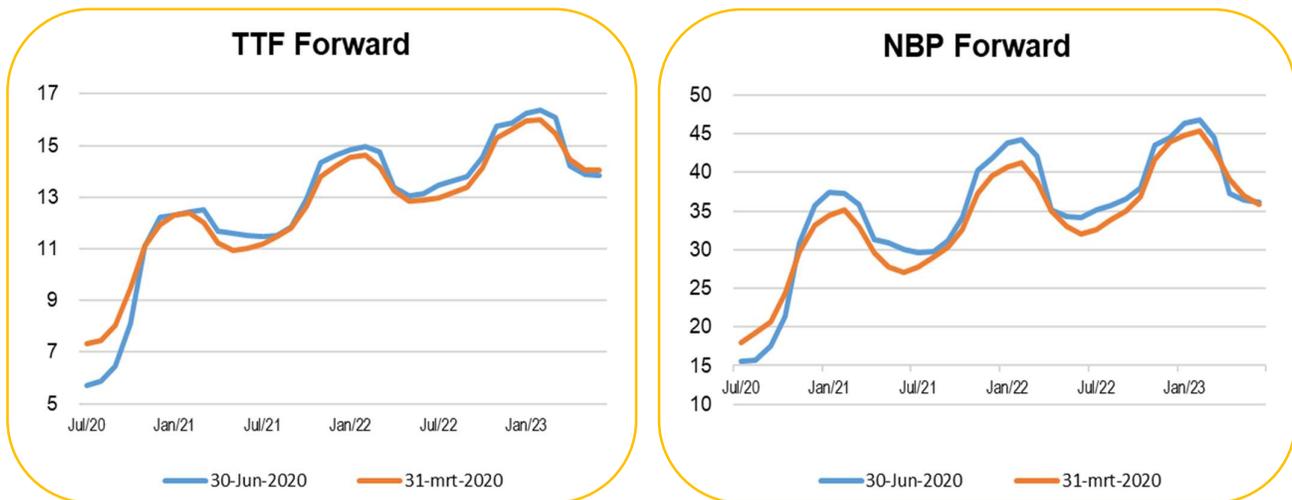
### NBP Price History



## Volatility

Market	Spot Volatility					Year-ahead Forward volatility				
	1m	3m	6m	12m	KYOS sugg.	1m	3m	6m	12m	KYOS sugg.
TTF	89% ▼	97% ▲	73% ▲	88% ▲	67% ▲	19% ▲	23% ▼	31% ▼	29% ↔	29% ↔
NBP	55% ▼	138% ▲	105% ▲	105% ▲	71% ▲	21% ▲	24% ▼	32% ▼	30% ↔	30% ↔
GPL	86% ▼	87% ▲	69% ▲	95% ▲	69% ▲	18% ▲	22% ▼	28% ▼	27% ↔	27% ↔
NCG	85% ▼	79% ▲	65% ▲	94% ▲	69% ▲	18% ▲	22% ▼	28% ▼	27% ↔	27% ↔
PEG-N	106% ▼	105% ▲	83% ▲	96% ▲	68% ▲	20% ▲	23% ▼	30% ↔	28% ↔	28% ↔

## Price Forward Curves



## Market Trend

The COVID-19 crisis had a strong impact on gas prices during Q2-2020. Lower industrial activity across Europe drove down gas and power demand and as a result gas spot prices. TTF spot prices bottomed at the end of May at an historical low level of just over 3 €/MWh. During June, spot prices recovered and stabilized at around 5 €/MWh. The low absolute price levels combined with the observed spot price changes led to an increase of the spot price volatility over Q2-2020. We increased our view on the TTF spot price volatility to 67%, 3 percent points up compared to our assessment of the previous quarter.

The curve was more immune for the COVID-19 crisis, reflecting the markets view that the effects of the crisis are not long lasting. Furthermore, oil prices also gave support to longer-term gas prices. After a strong dip at the end of April, leading to the first ever negative prices for the NYMEX front-month contract, oil prices recovered sharply. At the end of Q2-2020 the TTF Cal-20 contacts closed therefore even 0.5 €/MWh higher, at 12.50 €/MWh, than at the start of the quarter.

The storage spread (Q1-2022 x Q3-2021) only showed little movement. On the TTF the spread went slightly down and up on the NBP. The combination of increased spot volatility and a wider storage spread led to an increase in the assessed market value of our NBP storages. The full option value of the 30-day storage product for example went up with 0.73 p/th to 21.90 p/th. On the TTF the effect of the increase in spot volatility was cancelled by the decrease in the storage spread. The market value of TTF storages was marginally negative as a result.

Higher spot volatility and an overall higher price level during Cal-21 are the main drives for the increase seen across the assessments of the most of our swing contracts. However, value changes compared to our assessment of the previous quarter are small.

## 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 30 June 2020.
- 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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