Gas and power market analysis

February 2020

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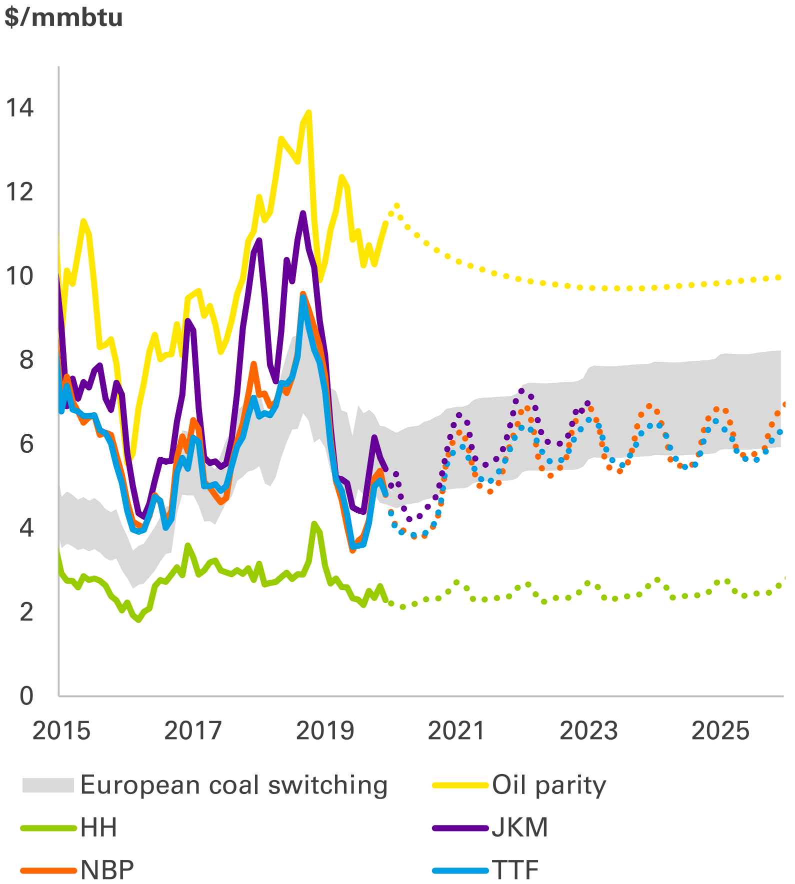
Historically low mid-winter gas prices

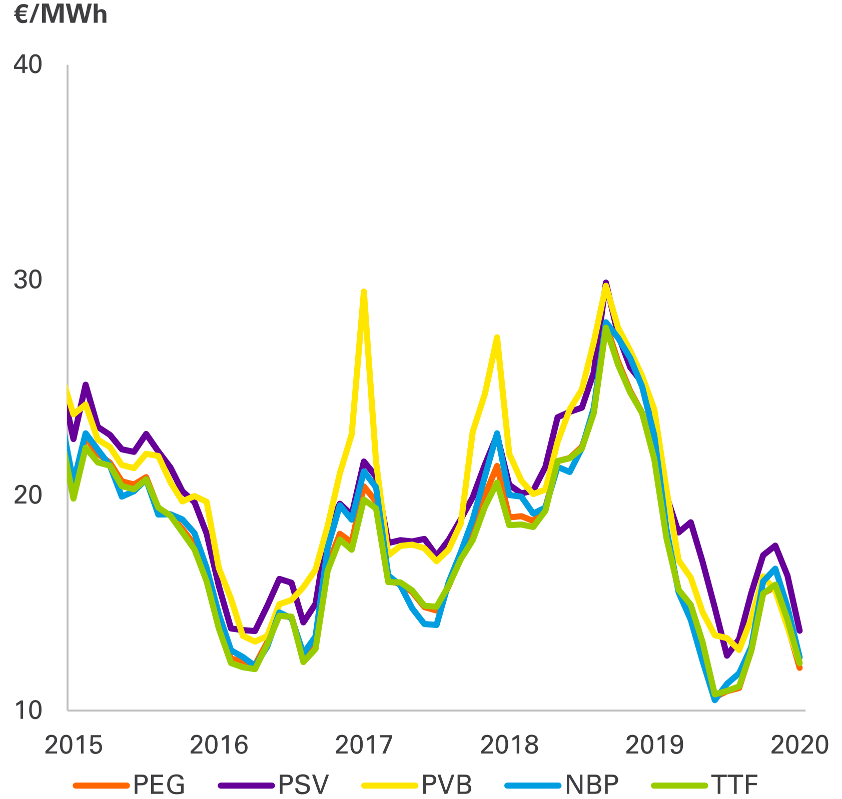
- NBP, TTF and JKM have fallen by between 10-20% since Oct-19 and are currently at their lowest winter levels since 2005.
- The drop in prices comes against a backdrop of strong gas supplies into Europe, record high European storage levels, growing LNG supply, lacklustre LNG demand growth in Asia and a new pipeline gas transit deal between Russia and Ukraine.

Global gas benchmarks



Futures as of 09/01/2020

European gas benchmarks



PEG = French gas
PSV = Italian gas
PVB = Spanish gas
NBP = British gas
TTF = Dutch gas

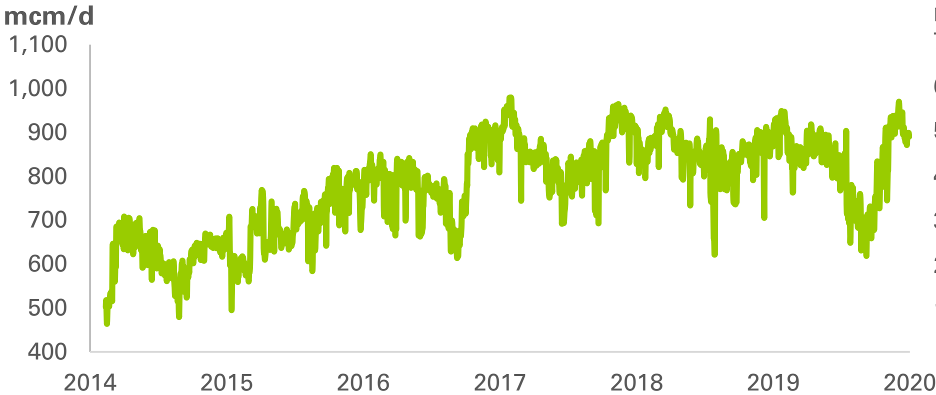
Source: NYMEX, ICE, Heren, S&P Global Platts ®

European pipeline imports recover following summer maintenance

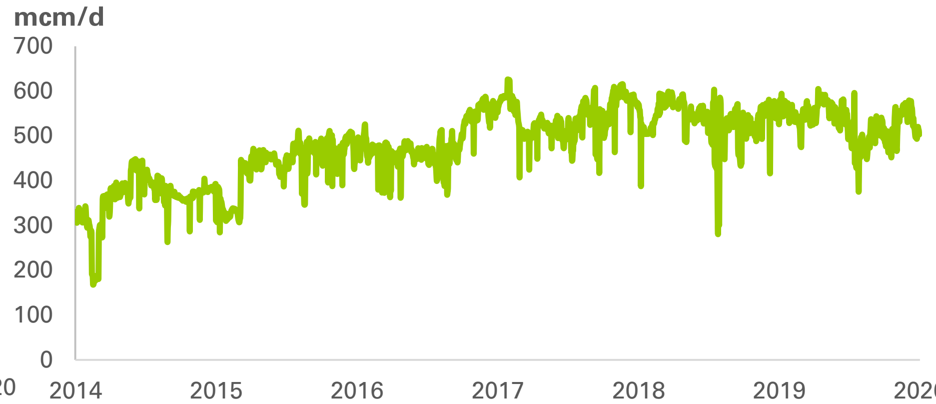
- Pipeline flows into Europe increased during 4Q19 following higher imports from Russia and Norway.
- Algerian pipeline imports remain low year-on-year.

Europe pipeline imports

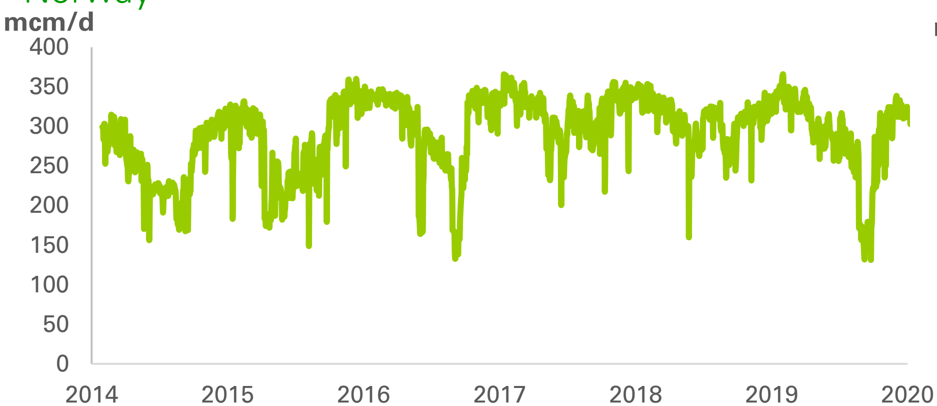
Total



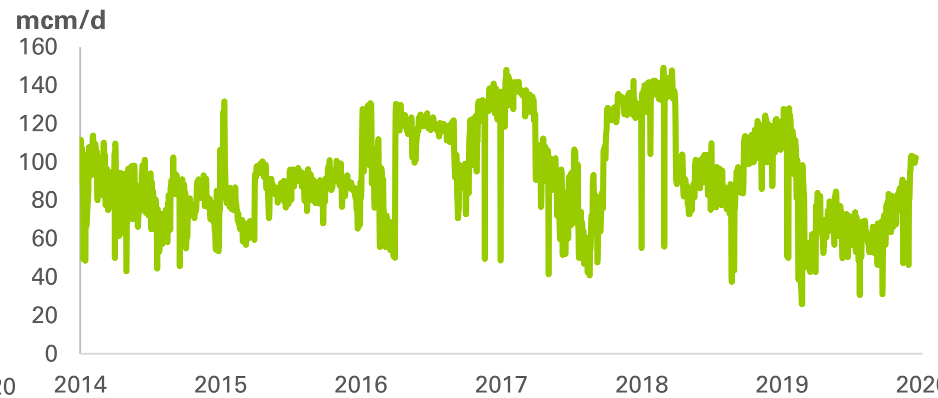
Russia



Norway



Algeria



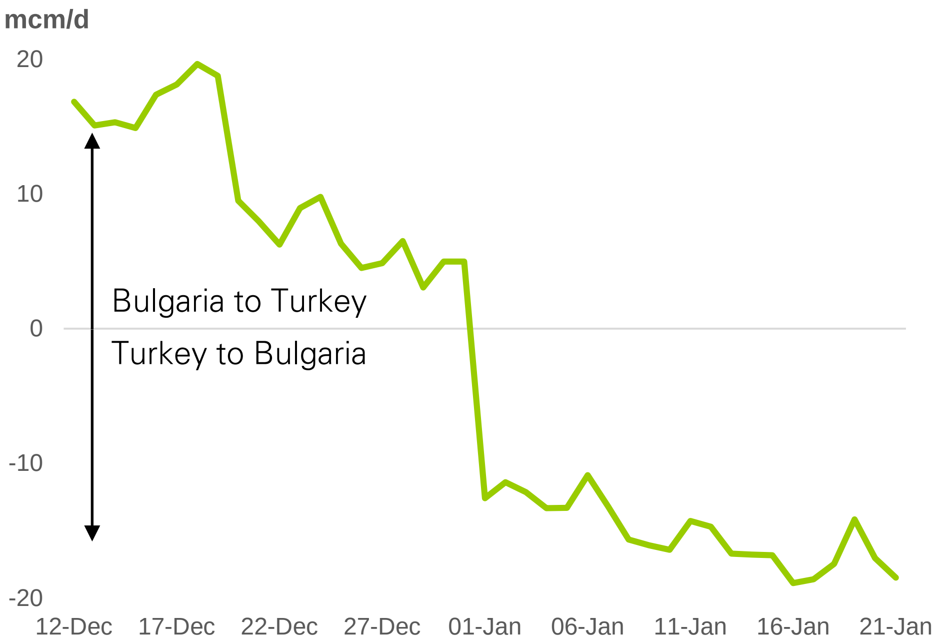
Total flows are from Russia, Norway, Algeria & Libya; Russia flows are to Central Europe only

Source: Official TSO Statistics

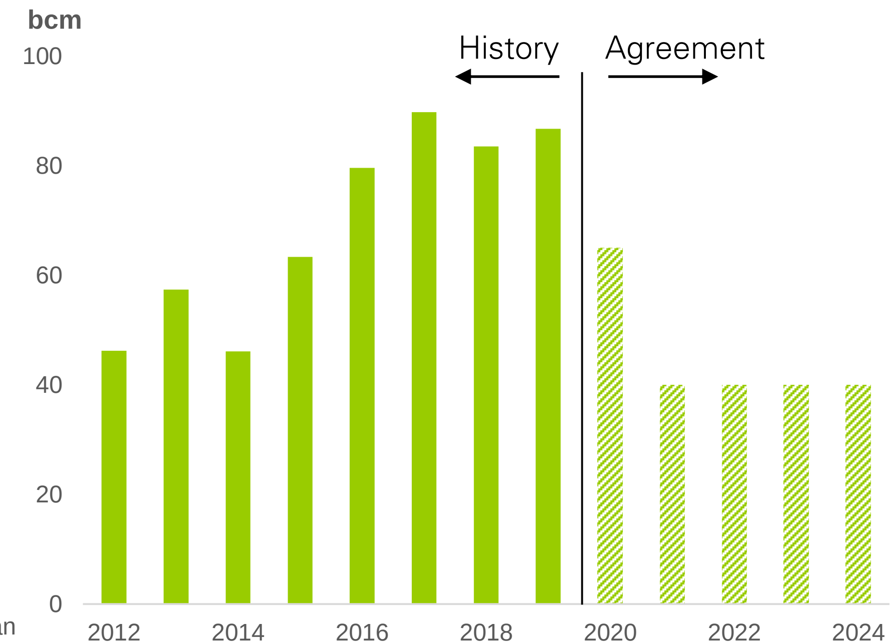
Russian gas pipeline transit to Europe

- **Russia and Ukraine** signed a 5-year gas transit deal in Dec-19, easing concerns of a potential disruption to Russian flows at the start of 2020. The deal includes **65 bcm/a** of transport capacity in 2020 and **40 bcm/a** during 2021-2024 (see right chart).
- The Russian **TurkStream** pipeline saw first gas flows on 01-Jan-20. The two-string pipeline bypasses Ukraine and has **31.5 bcm/a** of capacity. Its start-up has led to a switch in flow direction at the Bulgaria-Turkey border (see left chart). Previously, Russian gas was delivered to Turkey via Ukraine and Bulgaria. Since the start-up of TurkStream, Russian gas has been delivered to Bulgaria via Turkey.
- **Nord Stream 2**: Danish permission to complete the pipeline has been granted. However, uncertainty remains on start-up.

Bulgaria-Turkey border flows



Russian flows through Ukraine

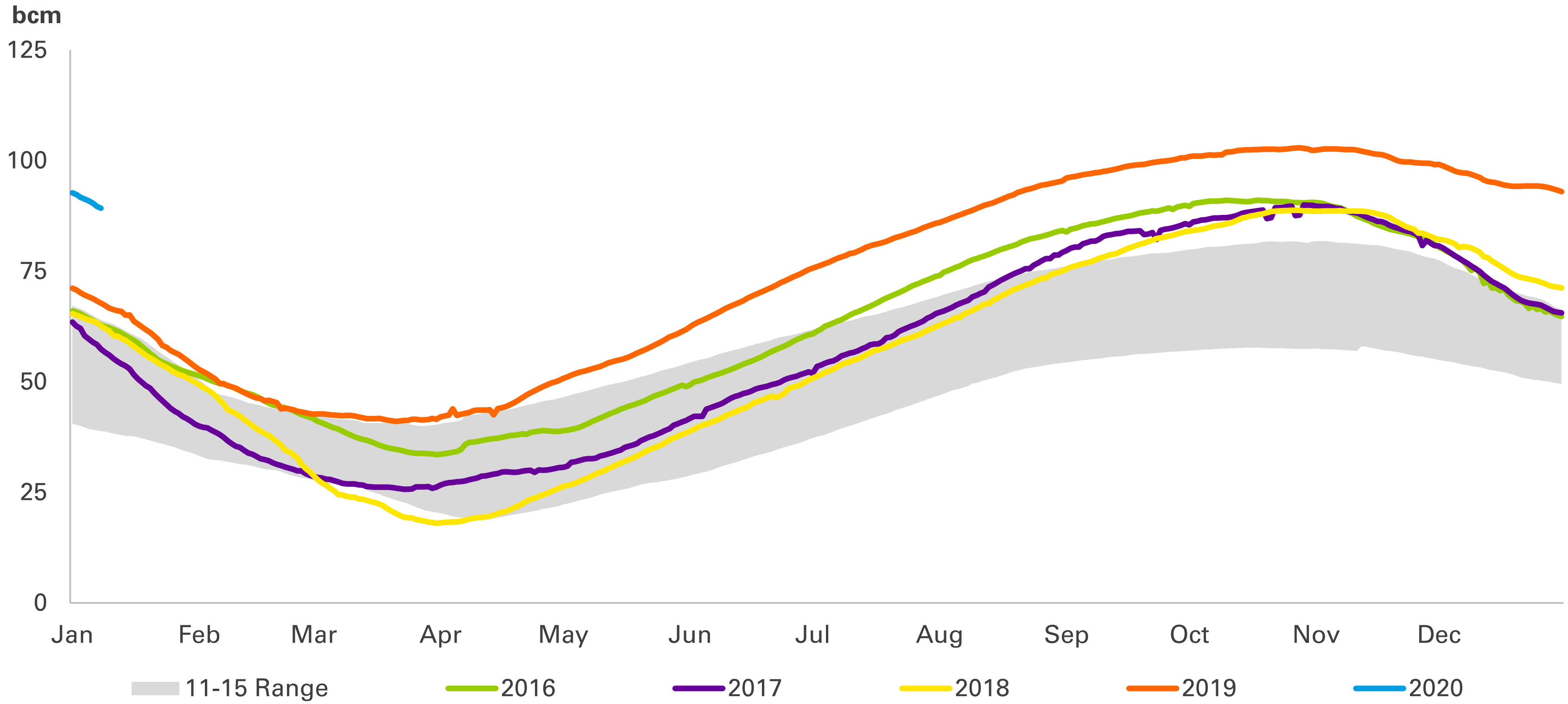


Source: ENTSOG, Official TSO Statistics

European gas inventories remain significantly above historic levels

- Robust pipeline imports and record high LNG deliveries in 2019 saw European storage levels reach all time record highs in 4Q19, with many individual storage facilities reaching full capacity.
- Continued strong supplies have reduced the need for storage withdrawals so far this winter.
- European gas inventories were 21 bcm, or ~33% higher at the beginning of Jan-20 compared to the same time last year.

European GIE storage

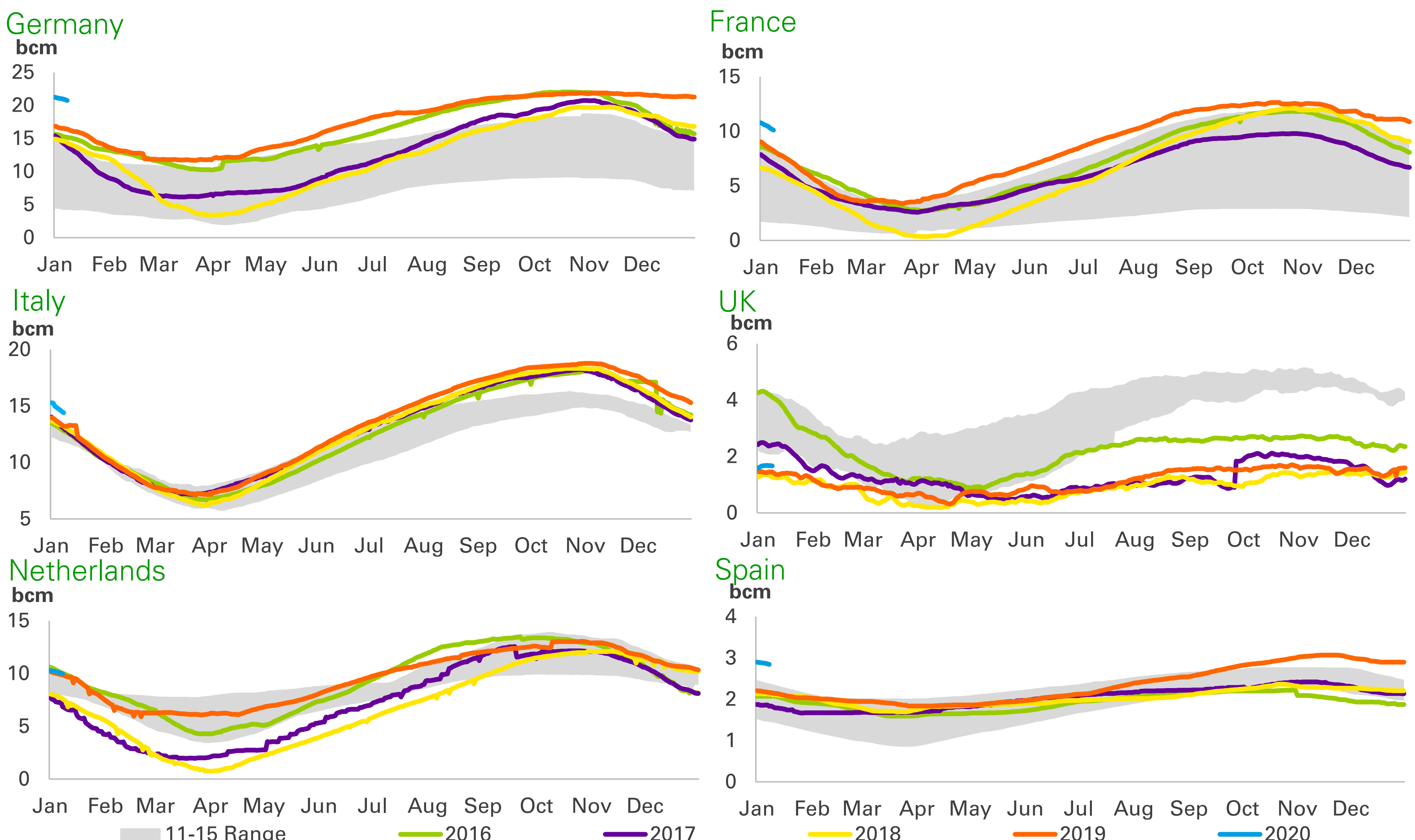


N.B. data from GIE does not incorporate all storage facilities in each country, but rather can be used as a proxy for total storage

Source: Gas Infrastructure Europe

Strong European storage injections

Germany, France and Spain in particular have sustained high inventories.



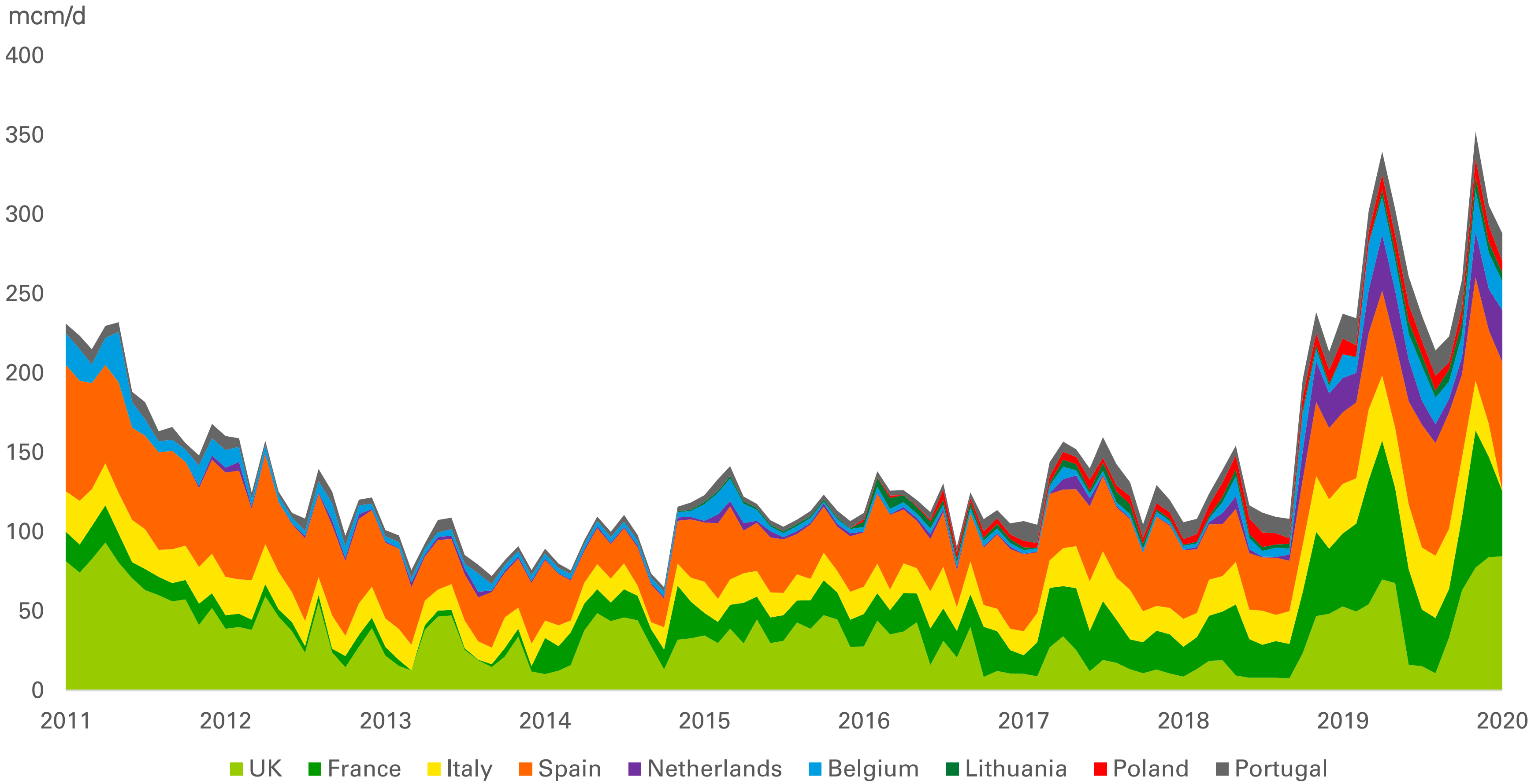
N.B. data from GIE does not incorporate all storage facilities in each country, but rather can be used as a proxy for total storage

Source: Gas Infrastructure Europe

LNG send-outs remain strong

- During 2019, European LNG send-outs more than doubled year-on-year, as growing global LNG supply and a slowdown of LNG demand growth in Asia resulted in a wave of cargoes heading into Europe.
- After reaching a record ~350 mcm/d in Nov-19, send-outs have retracted, although remain historically high.

Monthly European LNG send-outs



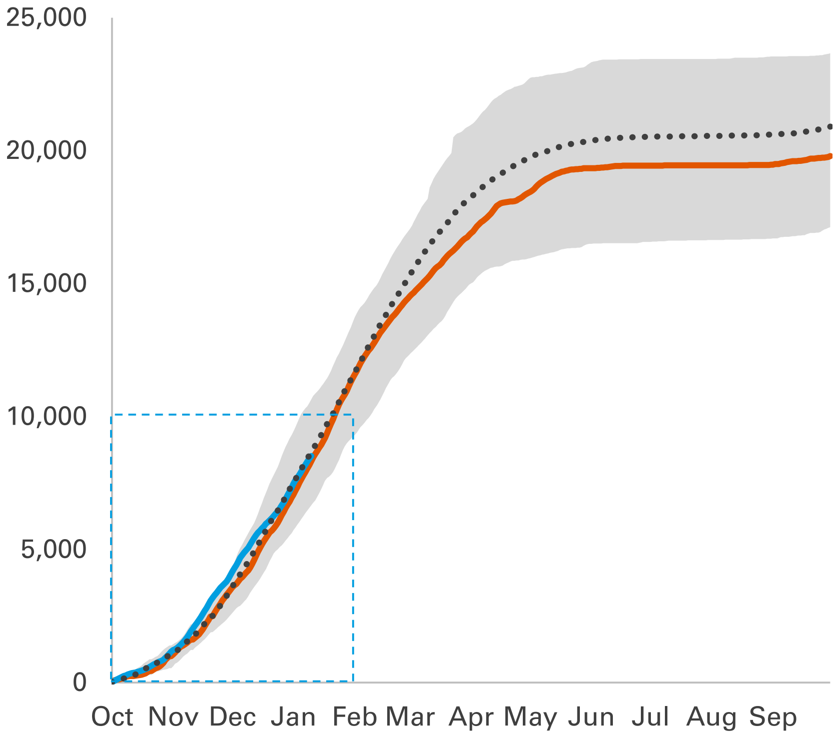
N.B. data does not incorporate all regasification facilities in Europe, but rather can be used as a proxy for LNG send-outs

Source: Official TSO Statistics

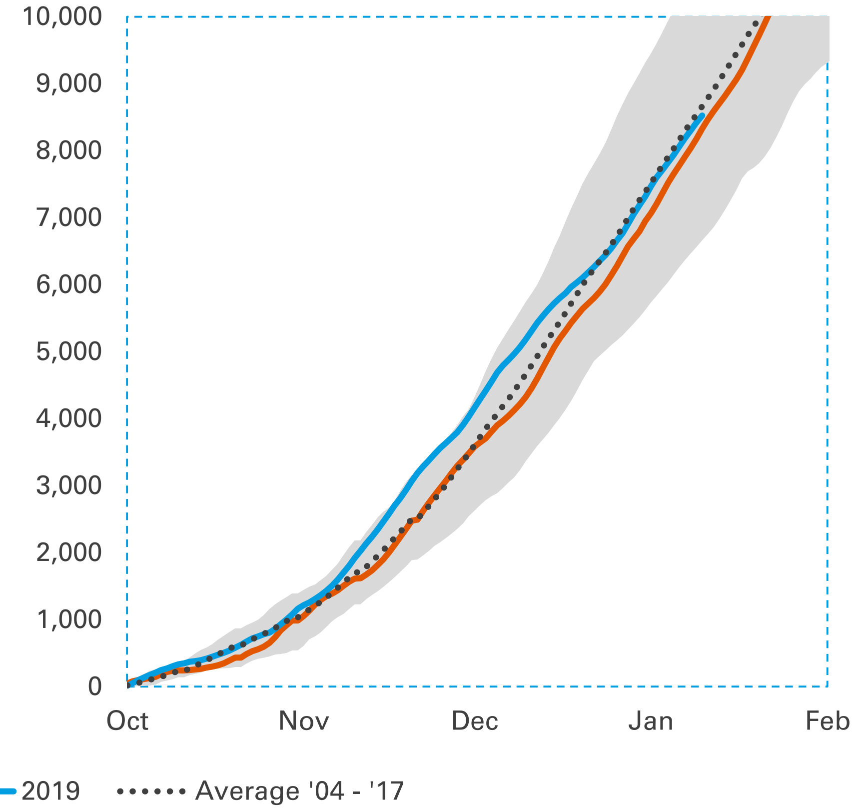
Cumulative HDDs return to historical average

While Nov-19 was colder than average, seasonally mild temperatures since then have brought cumulative HDDs back to historic average levels.

Europe Cumulative HDDs



Europe Cumulative HDDs (Enlarged)



Gas Years

Source: BP Analysis

Carbon prices stabilise to end 2019 high

- EUA prices were stable during 4Q19, hovering around €25 per tonne.
- Despite volatility earlier in the year, a stable 4Q19 makes 2019 the highest yearly average EUA price ever at €24.86 per tonne.

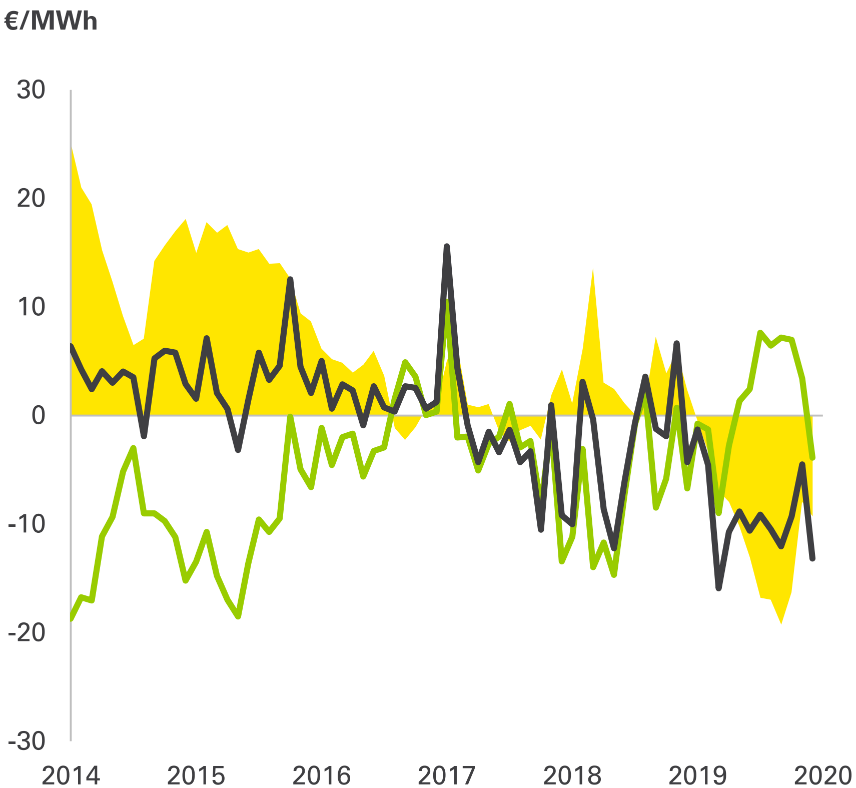
EUA carbon futures

Source: ICE

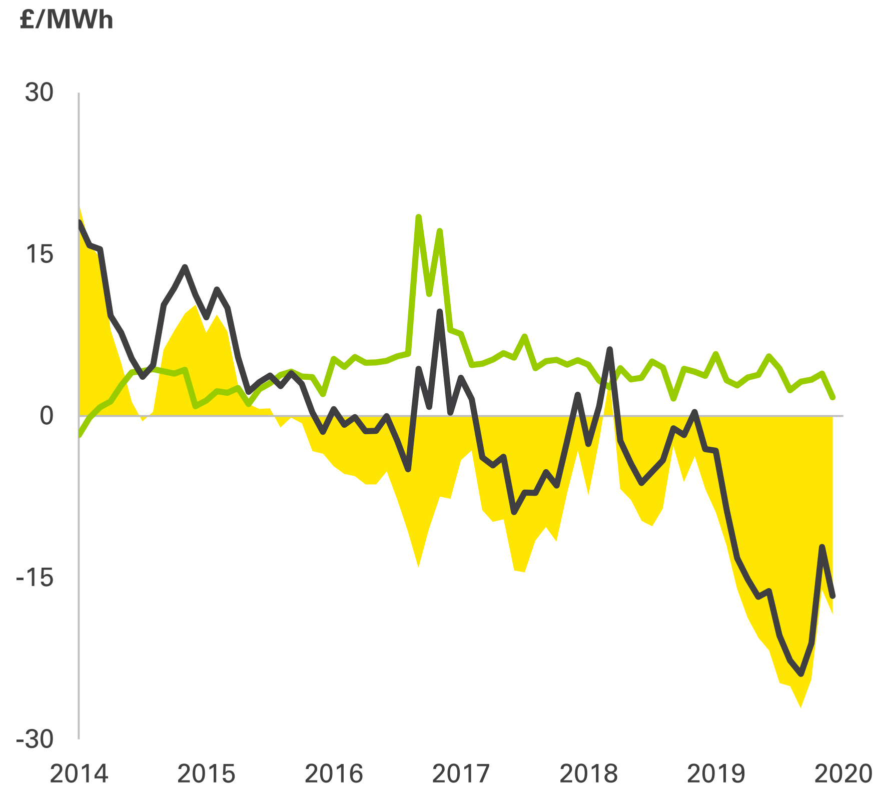
Cheap gas and high EUAs send gas-coal spread negative in 2019

- Clean Dark spreads have been considerably negative in Germany and the UK during 2019.
- German Clean Spark spreads were positive on average in 2019 for the first time in many years.

German power spreads



UK power spreads



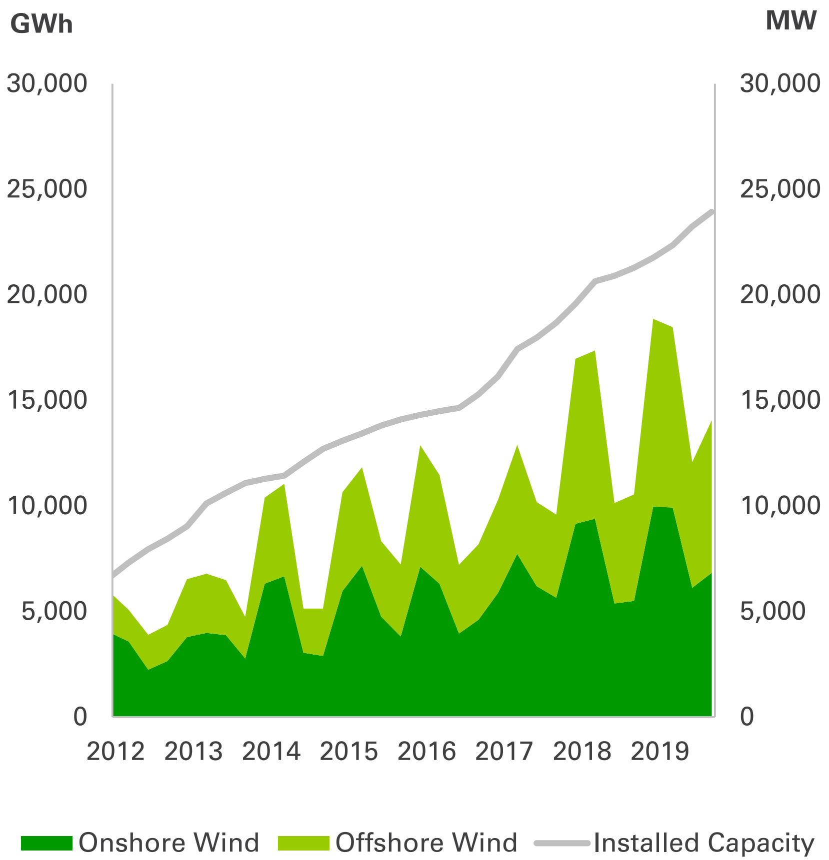
Gas-coal   Clean Spark Base   Clean Dark Base

Source: Heren, ICE, EPEX, N2EX

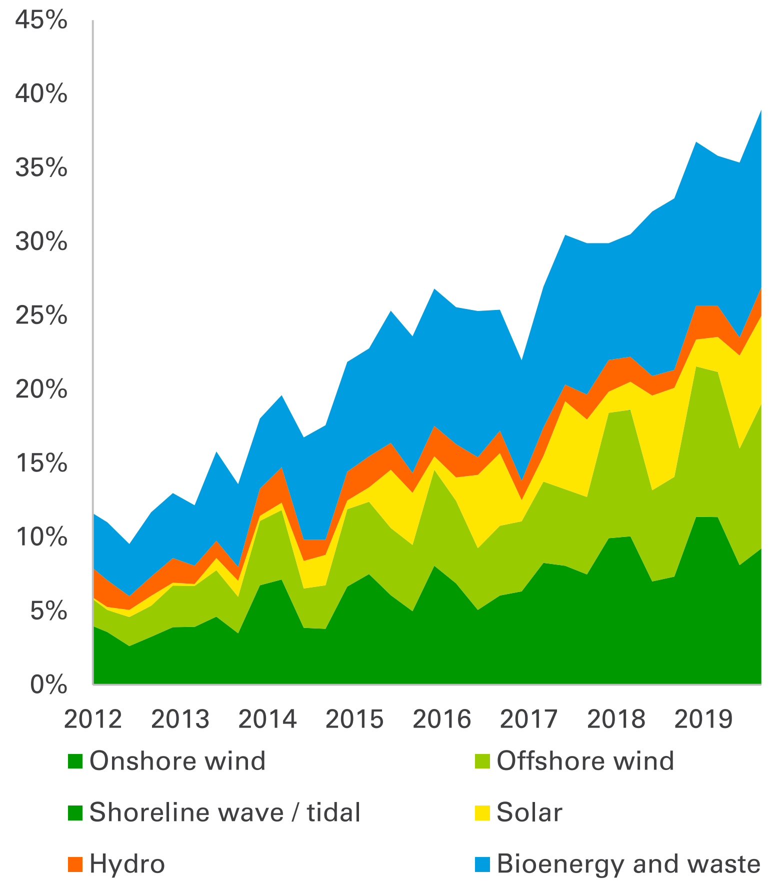
UK Power generation from renewables grows

- The share of renewable electricity generation in the UK hit a new high in 3Q19, at 39%, 6% points more than in 3Q18.
- Wind capacity and generation continues to grow, with combined onshore and offshore wind power generating 19% of UK electricity in 3Q19.

UK wind capacity & generation



Share of UK electricity generation



Source: gov.uk