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Argus Insight: Natural Gas



European gas demand in summer 2022

After a turbulent winter, Europe is scrambling to prepare for the next. Replenishing gas storage ahead of the next heating season is a key focus — not least because of persisting uncertainties over Russian deliveries as a result of the conflict in Ukraine.

Besides stronger imports from non-Russian sources, especially in the form of LNG, demand reductions have become a key focus to free up supply for storage additions.

Warmer spring weather, more employees returning to their offices and continued manufacturing cutbacks in response to elevated gas prices could curb consumption this summer. Meanwhile, the scope for demand reductions in the power generation sector could be limited, especially in southern Europe, where low hydropower output might bolster the need for thermal generation.

Argus provides insights on how demand across Europe's six largest gas-consuming countries — Germany, the UK, Italy, the Netherlands, France and Spain — could shape up this summer.

Warmer spring, office return to cut residential demand

Warmer spring weather than a year earlier and more employees returning to offices could curb European gas demand this summer.

Scenarios for summer household and small business demand			
TWh	Pre-Covid weather-adjusted	Average weather-adjusted	2021 weather-adjusted
Cool summer	505.2	517.2	529.2
Base case	460.2	472.1	483.9
Warm summer	416.2	427.9	439.6

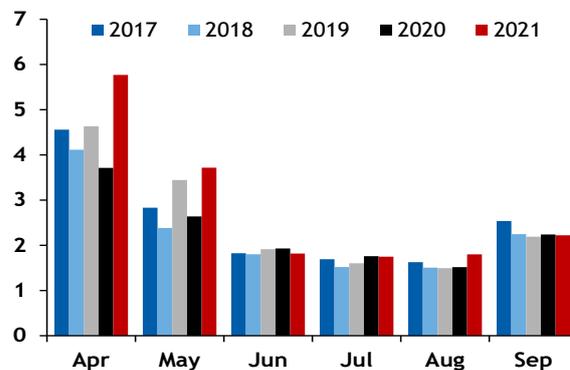
While there was a cool start to April, the weather across much of Europe has been warmer than a year earlier in recent weeks, curbing consumption.

And demand from households and small businesses in the six largest gas-consuming countries could fall by at least close to 50TWh on the year this summer.

Deliveries to local distribution networks across the six countries were 2.84 TWh/d last summer, or a cumulative 519.5TWh, the highest in recent years. This was partly because unseasonably cool spring weather bolstered heating demand.

But demand was still strong even after adjusting for the weather. Much more extensive homeworking because of the pandemic led to a double-heating effect — homes were heated for longer periods, in addition to offices and public buildings. And unlike in summer 2020, there were no prolonged full closures of buildings such as schools, shops or restaurants to curb the spread of the virus. Full-scale lockdowns had led to a sharp drop in weather-adjusted demand in summer 2020.

Household demand high in spring 2021 TWh/d



Most Covid-19 containment measures, including homeworking obligations in some countries, have either been lifted or are about to be removed across much of Europe. But while the extent of homeworking may be reduced, a full return to pre-Covid levels seems unlikely.

In a base-case scenario that assumes heating degree days across the six countries in line with the 20-year average and weather-adjusted demand halfway between last summer and the period in 2017-19, deliveries to local distribution networks are 2.58 TWh/d. This leaves them 259 GWh/d, or a cumulative 47.4TWh, lower than a year earlier, with the bulk of the decrease concentrated in April-May.

And unseasonably warm weather has been forecast for this quarter, which could result in even sharper drops in demand.

The UK’s Met Office sees an increased likelihood of a warm spring. In late March, it assessed a 45pc likelihood of “warm” conditions in the UK in April-June, 2.3 times higher than normal, while it put the possibility of “cool” weather at just 5pc. And France’s Meteo-France projected a 50pc chance of higher-than-usual temperatures in the country for April-June and just a 20pc chance of unseasonably cold weather. Germany’s DWD forecast temperatures to hold 0.5-1°C above the long-term average across much of Germany in the second quarter.

In a low demand scenario based on the warmest weather in the past 20 years and weather-adjusted demand at pre-Covid levels, consumption from households and small businesses is as low as 2.27 TWh/d, amounting to a cumulative year-on-year decrease of over 100TWh.

EU plans to sharply reduce the bloc’s dependence on Russian imports by the end of this year entail measures that could cut into weather-adjusted demand. Most notably, EU-wide energy saving measures, such as “turning down the thermostat for buildings’ heating by 1°C”, could substantially reduce consumption, the commission has said. But it remains to be seen how and when such measures can be implemented. The EU is also considering accelerating the installation of solar panels and heat pumps to reduce gas demand in the short term.

Industrial cutbacks to curb consumption

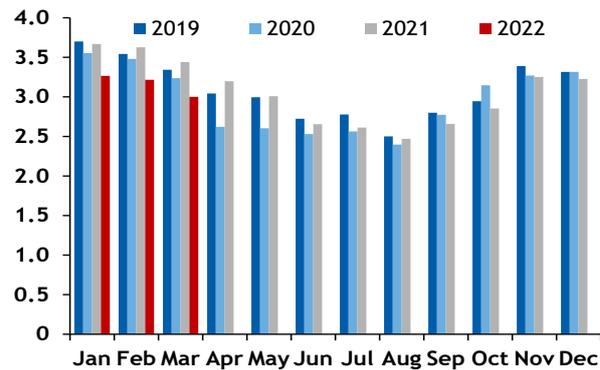
Gas use by industry in the six biggest consumers could fall by over 30TWh this summer from a year earlier because of firms turning down production or switching to other energy sources in response to high prices.

High gas prices have cut into industrial gas use since the middle of 2021, with demand destruction gathering further pace in recent months.

Aggregate industrial gas consumption in the six countries was almost 11pc lower in the first quarter of this year than over the

Industrial demand weak in 1Q

TWh/d



same period in 2019 — before the pandemic substantially curbed economic activity in Europe.

Assuming industrial demand in April-September this year falls by 9pc from the pre-Covid summer of 2019, it would be around 457TWh, or 2.5TWh/d.

This would be close to 34TWh, or 184GWh/d, lower than demand last summer.

Industrial demand last summer was only slightly lower than in 2019, despite substantial decreases in the third quarter because of the onset of manufacturing cutbacks in response to higher prices. It had been strong in the second quarter, when unseasonably cool spring weather required industrial sites to be heated more extensively and increased gas use for industrial processes that rely on heat, such as furnaces.

In any event, there may be scope for industrial gas consumption to fall even more sharply in summer than at the start of this year, if gas prices stay high.

Some companies, such as fertiliser firm Yara, announced production cuts in early March after gas prices climbed to fresh highs because of the Ukraine conflict. And European contracts for delivery this summer have only fallen slightly in recent weeks.

And more firms may find ways to substitute gas with other energy sources over time, if an incentive to cut gas use persists.

Data for the Netherlands — where a detailed breakdown of consumption by sector is available — indicate that consumption by the chemicals and refining industries has fallen particularly sharply in recent months. And the refining sector similarly accounted for much of the drop in Spain’s industrial consumption.

Low nuclear, hydro to buoy power-sector gas burn

Low nuclear and hydroelectric generation could make it difficult for power sector gas burn in the six countries to be turned down this summer from year-ago levels.

Weaker demand from the power sector features heavily in EU plans to reduce its gas use. And prevailing prices still indicate that gas will remain largely uncompetitive with coal this summer. But aggregate power sector gas burn in the six countries may in fact have to rise on the year.

Lower nuclear generation in Germany and France and slow hydroelectric output in the region could leave a gap that stronger wind, solar and coal-fired output may struggle to close, assuming overall demand for electricity generation is stable.

French nuclear output could fall by just over 150 GWh/d on the year this summer, assuming generation over the full year is in the middle of state-controlled utility EDF's 2022 target of 295-315TWh from early February. And Germany took around half of its remaining nuclear capacity off line at the end of 2021, leaving three plants operational. The country's nuclear output could consequently halve this summer, amounting to a drop of nearly 90 GWh/d.

Hydroelectric generation in the six countries fell by 220 GWh/d, or 40pc, in January-March from a year earlier. Low stocks at the start of this year and low precipitation curbed output. And reservoir levels in Europe have remained considerably lower than a year earlier, suggesting that output may remain slow in the coming months. A 40pc decrease this summer would leave hydro output almost 180 GWh/d down on a year earlier.

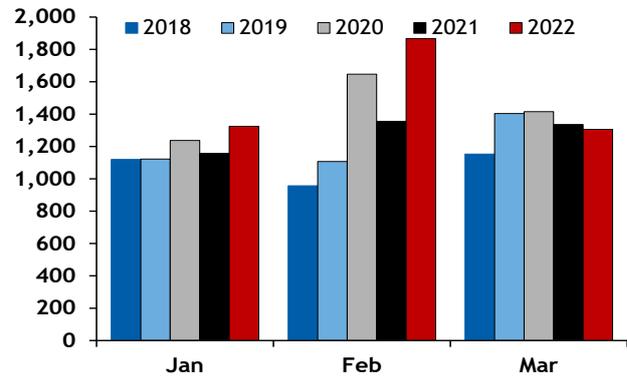
Combined with a 240 GWh/d fall in aggregate French and German nuclear generation, this would open a gap of around 420 GWh/d.

Higher wind and solar output, partly thanks to further capacity additions, may help close some of this gap.

Combined wind and solar generation in the six countries was up by around 17pc on the year in January-March, largely thanks to an increase of almost 40pc in February because of extremely windy weather.

Wind and solar output climbs in 1Q

GWh/d



A 17pc increase this summer would provide around 200 GWh/d of extra generation from these sources, compared with levels a year earlier.

While this would be by far the largest recent year-on-year increase, it would still leave a gap of about 220 GWh/d. If a gap of this magnitude had to be filled entirely by fossil fuel-fired generation, power sector gas burn would have to rise, unless coal-fired output climbed to highs unseen in years.

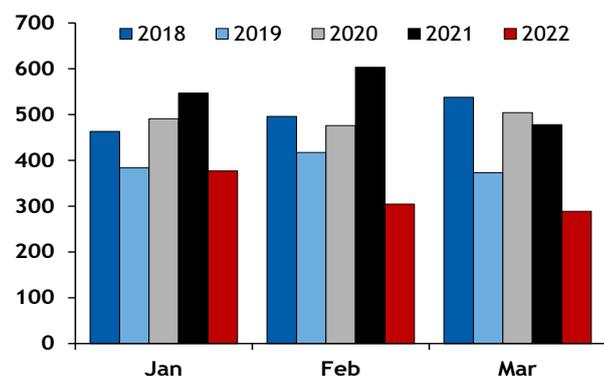
Coal-fired generation would have to rise to 425 GWh/d to fill such a gap on its own, more than double the 205 GWh/d a year earlier.

This would be not far off the 447 GWh/d in summer 2018, the last time gas was almost entirely uncompetitive with coal. At the time, coal-fired generation reached a share of over 30pc of combined coal and gas-fired output.

But it may be difficult for coal-fired generation to climb back to these highs. Coal-fired capacity has fallen sharply in recent years as a result of plant closures, although some planned closures, for instance in the Netherlands and Germany, have recently been delayed. And while there may theoretically still be

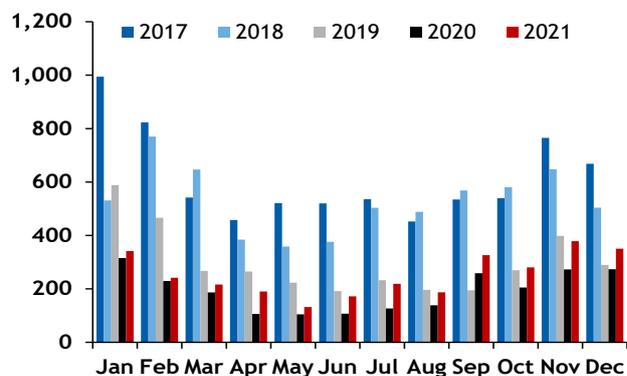
Hydro generation drops in 1Q

GWh/d

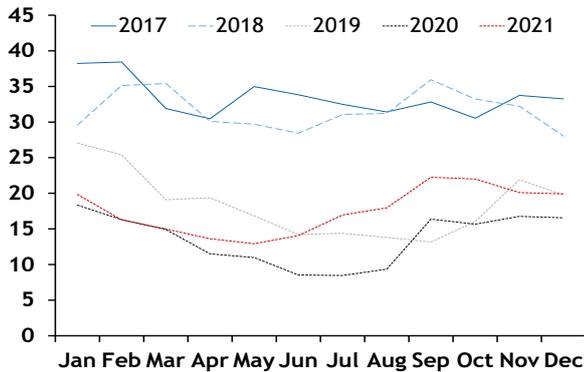


Coal-fired generation falls

GWh/d



Coal share in combined coal and gas output slips %



sufficient capacity available to reach the 2018 highs, coal-fired generation has recently remained much lower, even when it was considerably more profitable than gas-fired output.

Gas-fired plants have been well behind coal-fired counterparts in the merit order since mid-2021. But coal-fired generation was still just 337 GWh/d in the fourth quarter of 2021, the latest data show, peaking at 379 GWh/d in November. It had a share of just over 20pc of combined coal and gas-fired generation in October-December, far behind 30pc in summer 2018.

And a coal-fired share of less than 30pc would mean that gas-fired generation has to rise this summer, if combined output from both sources is to increase by 220 GWh/d.

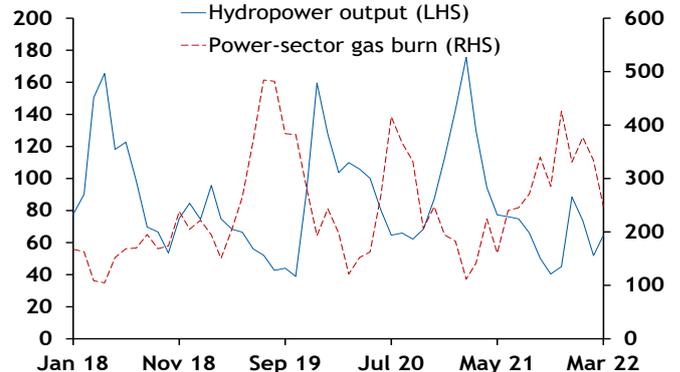
Limited coal supply could also prevent output from rising sufficiently to enable a fall in gas-fired generation. The EU in early April imposed an embargo on Russian coal imports. And it may be difficult for Europe to raise its imports from elsewhere by enough to offset a halt to Russian deliveries and meet a sharp rise in demand. Coal stocks at the Amsterdam-Rotterdam-Antwerp hub had by early April fallen to historical lows because of firm demand.

Lower overall demand for electricity generation in the six countries could reduce the gap that fossil fuel generation has to fill, possibly providing downside for power sector gas burn.

Industry curtailing consumption because of high electricity prices and campaigns aimed at reduced power usage in homes and offices may curb overall demand.

That said, while overall power generation climbed last summer from 2020, when the pandemic had cut sharply into demand, it was already lower than in any of the previous three years. And low hydro stocks elsewhere in Europe, such as the Nordics, could bolster the need for generation in the six countries. In any event, an emergency situation — arising for instance from a complete halt to Russian gas deliveries to Europe that leads to a rationing of supply — could substantially alter the outlook.

Spain gas burn, hydro GWh/d



Power-sector gas use faces north-south split

Power-sector gas use in northwest and southern Europe could be headed in opposite directions this summer compared with a year earlier because of differing fuel-switching potential and reliance on hydropower generation.

Year-on-year changes could vary widely across the region, similar to recent months. Power-sector demand may have to rise in Italy, Spain and France compared with last summer, while it could fall elsewhere — although this will depend heavily on changes in wind and solar output.

Low hydroelectric generation could lift power-sector gas burn in Spain and Italy in particular.

Spanish hydropower output more than halved in January-March, as a result of weak precipitation and low reservoir levels. Power-sector gas burn more than doubled in response, climbing to 320 GWh/d from 145 GWh/d. And Spain's hydroelectric stock deficit to a year earlier has almost doubled since late last year, with inventories in late March holding nearly 6TWh lower than at the same time in 2021.

Italian hydropower generation also slumped during the first quarter, driving up power-sector gas burn by nearly 100 GWh/d. And Italy's reservoir levels also lag behind those recorded a year earlier, while rivers in the north of the country carry little water. The Adda river's water levels have been at the lowest in 50 years, while flows through the Dora Baltea were at just half of those seen a year earlier. In addition, snowpack in Alpine regions has declined to record lows, according to Italian hydro association Anbi. This could limit snowmelt in the coming weeks and curb run-of-river generation.

France's power-sector gas burn also climbed in January-March from a year earlier as a result of weaker hydroelectric output and slower nuclear generation. EDF's 2022 nuclear output target suggests that generation could remain much weaker than a year earlier this summer, lifting the call on gas-fired output.

In contrast to these countries, power-sector gas burn in Germany, the Netherlands and the UK could fall this summer compared with last year.

Hydroelectric output accounts for a much smaller share of overall electricity generation in northwest Europe. And the region's scope for fuel-switching away from gas to coal is much larger than it is in southern Europe.

In Germany and the Netherlands, extensive switching to coal-fired generation has already cut sharply into gas-fired output since gas prices rallied from mid-2021 onwards. This has curbed power-sector gas burn compared with a year earlier. German gas-fired generation even fell considerably in March

from a year earlier, despite weaker renewable output, as coal stepped up sharply to fill the gap.

And TTF and Germany VTP contracts for summer delivery have remained above the top of the coal-to-gas fuel-switching range, although they moved closer by mid-April. A quick April stockbuild has increased the possibility that at least some gas-fired plants could move ahead of older coal-fired units later on.

In any event, regulatory changes in the Netherlands may limit the scope for coal-fired generation to rise. From this year, coal-fired output is capped at an annual average of 35pc of a plant's capacity, although there have been calls for this restriction to be removed to reduce the need for gas-fired power.

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