

Pressure to reduce Russian gas dependence builds – but there's no silver bullet for sectors

Corporate decision-makers have a handful of measures available to them to significantly reduce gas demand from Russia. Gas to coal switching, curtailment of industrial production and lowering thermostats can have a big impact. But all come with trade-offs



Can consumers be encouraged to use less gas? Behavioural change is an important factor in becoming less dependent on Russian gas

The pressure is on to reduce Russian gas demand

As the invasion of Ukraine enters its fourth week, the pressure to disrupt Russian gas imports is becoming increasingly audible. If such a scenario were to materialise, [we've argued](#) that Europe would face a desperate scramble to fully replace Russian gas for next winter.

We've also [looked into](#) the European Commission's plan to reduce its dependency on Russian gas by two-thirds this year, the so-called REPowerEU, and argued that it might put too much emphasis on renewables.

We now look at what sectors and corporate decision-makers can do to actively reduce their

(Russian) gas demand. This is an issue that can no longer be ignored – it was already relevant to the energy transition, and is now even more urgent since the Russian invasion of Ukraine.

What Russian gas dependance looks like

The three most gas-intensive sectors are manufacturing, residential and commercial real estate (buildings), and the power sector, with each accounting for about one-third of European gas consumption.

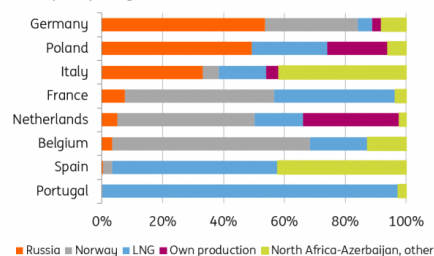
However, each country's breakdown is unique. For example, in France and Belgium almost half of gas consumption is for the residential and services sector, mainly for heating buildings. In Italy, the glass industry covers about a quarter of gas consumption in the manufacturing sector. In the Netherlands, it is the fertiliser industry that mostly drives manufacturing gas demand, accounting for a quarter of demand.

Of the countries we have examined, Italy and Germany are the most dependent on Russian gas. Countries like Portugal, Spain and France are the least dependent on Russian gas.

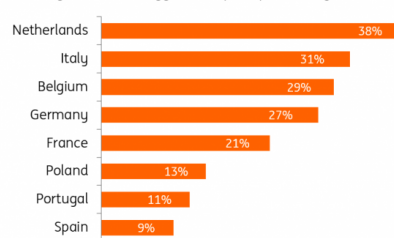
And some countries are already taking big steps to become less dependent on Russian gas. Poland, for example, will not extend its long-term contract with Gazprom of about 10 billion cubic meters (bcm) gas by the end of this year. From 2023 it will substitute Russian gas with gas from Norway through the Baltic Pipe that will be completed this year and with more LNG as the capacity of its LNG terminal will be increased next year.

Italy and Germany are most dependent on Russian gas

Gas imports per region in 2021



Dependency on gas as energy source differs across Europe
Share of gas in final energy consumption per country (2020)



Source: ING Research and Bruegel based on Entso-G and Eurostat

How corporate decision-makers in different sectors can save gas

There are plenty of gas-saving technologies that politicians, corporate decision-makers and households can implement. But only a handful of measures can significantly reduce gas demand in 2022. These are: substituting power generation from gas-fired to coal-fired power plants, curtailing industrial production due to high energy prices that make production unprofitable, and lowering thermostats in buildings (both houses and commercial real estate).

More coal-fired power production, curtailment of production in manufacturing, and lowering thermostats in buildings show highest potential to lower gas use

Estimate potential to lower gas use in 2022 for different sectors

| Gas use supply side* | Potential | Gas use demand side | Potential |
|---|---|--|---|
| Power sector | | | |
| <ul style="list-style-type: none"> Gas to coal switch More renewables (solar and wind) Gas to nuclear switch Gas to biomass switch | <p>High</p> <p>Medium</p> <p>Low</p> <p>Low</p> | <ul style="list-style-type: none"> Demand factors are captured in other sectors as the power sector is an intermediate sector | <p>See other sectors</p> |
| Manufacturing | | | |
| <p>Gas as feedstock in chemical industry</p> <ul style="list-style-type: none"> Gas to LNG switch Gas to biomass Gas to hydrogen switch Gas to coal switch | <p>Medium</p> <p>Medium</p> <p>Low</p> <p>Very low</p> | <ul style="list-style-type: none"> Curtailment of production Energy efficiency measures | <p>High</p> <p>Medium</p> |
| <p>Gas for heating</p> <ul style="list-style-type: none"> Gas to coal switch Gas to LNG switch Electrification (eg heat pumps) Gas to biomass switch Gas to hydrogen switch | <p>Medium</p> <p>Medium</p> <p>Low</p> <p>Very low</p> <p>Very low</p> | | |
| Residential and commercial buildings | | | |
| <ul style="list-style-type: none"> Gas to biogas switch Gas to coal switch Gas to heating oil switch Gas to biomass switch (fireplace) Electrification through heat pumps Connecting houses to district heating | <p>Medium</p> <p>Low</p> <p>Low</p> <p>Low</p> <p>Low</p> <p>Very low</p> | <ul style="list-style-type: none"> Lower the thermostat Energy efficiency Home refurbishment Reduce street & commercial lighting | <p>High</p> <p>Medium</p> <p>Low</p> <p>Low</p> |

*We only consider gas supply and demand in a sector, not for example the potential in a country to increase its domestic gas production or import more LNG.

Source: ING Research

By estimating the impact of these measures in different sectors on overall gas demand we believe that corporate decision-makers and households can save 10-15% of gas in 2022. That can reach 20-30% by 2025 as they have more time to invest in gas-saving technologies.

Note that these estimates capture the potential to save energy without cutting down on production by business (curtailment) and without relying on reductions in comfort levels by households that are unrealistically high. In reality, the current high energy prices cause energy-intensive businesses to cut down production which reduces economic activity and gas demand even further (second-round effects).

Five key sector learnings

A gas to coal switch will be an important option for power generation in several countries

In the **power sector**, gas to coal switching has the biggest potential to lower gas demand. According to the [International Energy Agency](#), record-high gas prices caused coal-fired power plants in northwest Europe to increase their output by 20% year-on-year in the fourth quarter of last year. Gas-fired generation fell by more than 7% in the same period. The subsequent price

hikes since the start of the Ukraine conflict have only added to this trend.

Currently, there are legal barriers to fully reap the gas substituting potential of coal. In the Netherlands and France, for example, production from coal-fired power plants is capped below full capacity to reduce carbon emissions. However, these caps can easily be removed at the expense of [short-term climate pain](#).

Furthermore, countries like Germany and the Netherlands recently closed down coal-fired power plants that could be brought back to life. And proposed timelines for coal exits could be postponed to reduce gas demand.

In theory, Europe has the potential to reduce gas use from gas-fired power plants by increasing power generation from nuclear power plants. But not in 2022. Despite the energy crisis, [Germany](#) has reconfirmed its ambition to completely wind down atomic energy by the end of 2022, when it will shut its final three plants in Neckarwestheim, Essenbach and Emsland. And while [France](#) takes a positive stance on nuclear energy, 2022 will be a bad year for nuclear power production as around 20% of the fleet is at a standstill due to maintenance. On the other hand, [Belgium](#) has extended the lifecycle of two nuclear power that were planned to close by 2025 by 10 years in an attempt to strengthen the country's independence from fossil fuels.

In buildings, the best energy is that which is not consumed

Behavioural change is the main driver to lower gas demand in **buildings** – simply by lowering thermostats and by not heating offices overnight or during the weekend. It is a common-sense solution that offers rapid and efficient levers to reduce gas demand and to limit the impact of soaring energy bills. Plus, it makes sense as a way to reduce Russian gas but also to tackle climate change.

Note that consumers are the 'protected gas users' in the market, so other gas users need to reduce demand first when there are gas shortages. So if protected consumers save gas, there is less pressure on businesses to reduce gas demand.

Quick energy saving wins in buildings, such as turning the thermostat down, could save more than 10 billion cubic metres (bcm), something both the [European Commission](#) and the [International Energy Agency](#) has recommended.

Some solutions are already well known, others less so

In **buildings**, solar thermal energy can make a difference. A [YouGov](#) survey found that 1.9 million German homeowners are planning to purchase a solar system for central heating or hot water generation. Heat pumps are also likely to see a surge in development. These solutions are already well known and benefit from specific investment programmes and financial incentives. For example, France, Italy, Germany and the Netherlands all have incentive schemes to encourage people to make their homes more sustainable.

In **manufacturing**, short-term opportunities to substitute gas for other energy sources are limited as most industrial processes are dependent on one fuel, notably gas. But new technologies are likely to benefit from the current situation. For example, current price levels are a big incentive to increase the production of biogas/biomethane. Synthetic fuels like [hydrogen](#) can also substitute

gas in the long run but are not likely to benefit in the short term as these are still made from gas instead of renewable power.

Supply chain disruption and labour shortages are short-term obstacles

The supply chain disruptions triggered by the Covid-19 pandemic are not resolved yet, which weighs on the availability of key components in the **automotive sector**, but also for renewables in **power**, or heat pumps for **buildings**. The same goes for the war in Ukraine which will affect the supply of energy transition metals, like nickel and lithium (used to make electric vehicle batteries), palladium (used for catalytic converter) or neon and krypton (used to make semiconductor chips).

Skilled labour in real estate and the power sector is scarce, which is a key hurdle to installing solar panels, heat pumps or renovating houses. In some parts of the Netherlands, for example, there are 55 vacancies for every graduated fitter or electrician.

Administrative burdens can also slow down approval processes of technologies that substitute natural gas. For example, in France more than 1,000 projects of biogas/biomethane projects are in the approval queue line, ready to inject around 25 terawatt-hours per year in the grid.

Energy transition and energy security, both are talking big money

Many of the options to lower dependency on Russian gas are the same as the solutions we need to lower emissions. In that respect, the war could end up boosting investment in cleaner technologies.

The European Commission's new climate strategy, the [so-called Fit for 55 package](#), already called for ambitious investment plans worth 2% of Europe's GDP, which means they should immediately increase by €360bn. Building new liquefied natural gas (LNG) terminals to substitute natural gas from Russia with LNG from the US or Australia only adds to the cost.

Five hard trade-offs

Climate: lowering gas dependency could raise emissions

In the short and medium-term there is potential in the power sector to substitute gas for coal. Unfortunately, this comes at the expense of higher CO₂ emissions, as the carbon content of coal-fired power is twice the level of gas-fired power. It also results in higher air pollution (more fine particles).

In other words, if countries seek ways to ensure energy security (reduced dependency on Russian gas), they will find coal on the table, which hinders their capacity to achieve climate targets in the short term.

In the medium term, this trade-off can be solved through additional investment in renewable energies, energy-efficiency programmes, and technologies that make fossil fuels cleaner such as [carbon capture and storage](#) (CCS) on coal-fired power plants.

Economy: demand curtailment comes at a loss

Lower production levels are an effective way to reduce gas demand, particularly in manufacturing. But of course, this comes at an economic cost.

Experts estimate that the 80% increase in gas prices in the last six months of 2021 reduced total gas demand by around 5% last year. But gas prices rose another 35% in the first two months of 2022 and doubled during the invasion of Ukraine, causing heavy gas users to curtail further to stay profitable.

In the Netherlands, fertiliser producer [Yara](#) now runs its ammonia production at only 45% of production capacity, with some production sites in France already paused. And Dutch aluminium melter Aldel already announced in October 2021 plans to reduce its output by 60-70% at its Delfzijl aluminium smelter for at least six months. And Italy's famous [glassmakers](#) are struggling to survive with current gas prices. Clearly, we can expect more curtailment announcements if gas prices stay at elevated levels.

Politics: many governments are committed to gas as a transition fuel

In previous years, gas helped governments meet important energy and climate goals. The German government committed itself to phasing out nuclear power after the Fukushima disaster and to phase out coal to meet climate goals. The Netherlands and Poland also want to reduce their coal use.

Belgium is an interesting case. The Belgium government committed to closing down its old nuclear power fleet by 2025. Increased gas capacity was therefore urgently needed to fill the gap. However, government officials recently [announced](#) a 10-year life extension for two nuclear reactors, amid pressure to ensure the country's energy security. The continuing nuclear energy production from Doel and Tihange will now need to be negotiated with Engie, the utility company in charge of the 2GW reactors allowed to run after 2025. Engie had based its capital budgeting plans on closure in 2025. Keeping them open requires more investment to meet security standards up to 2035.

Renewable capacity cannot replace the vast amount of coal and nuclear capacity anytime soon and there needs to be a reliable backup for when the wind is not blowing and the sun is not shining. For many governments, gas was an important solution to these problems. For some, this also provided the logic of building the Nord Stream 2 pipeline as Europe would need more gas from Russia to meet these goals.

So, the new political target to become less dependent on Russian gas might backfire on other targets in the short term as they seem hard to combine. In any case, it will force governments and companies to question their energy transition strategies for the years ahead. Past experience tells us that these debates can become heated.

Behaviour: will behavioural change be last?

Behavioural change is an important driver in becoming less dependent on Russian gas, particularly when the next winter arrives and households and businesses start heating their houses and offices. But turning down thermostats comes at the cost of reduced comfort.

History teaches us that households and businesses are willing to make changes. The return of

awareness campaigns (not seen since the 1970s after the oil shock) – such as the ‘[chasse au gaspi](#)’ in France or the ‘[don't be fuelish](#)’ ads in the US – could trigger immediate behavioural changes.

But will it last? History also shows that people return to normal once the urgency to do something subsides. They are likely to turn their thermostats back on once energy prices reach normal levels again.

In the long run, we need technological change to increase energy efficiency for a steady and prolonged period of time. Again, history teaches us that it is very hard to bring about an acceleration in energy efficiency without a sustained increase in energy prices. In recent years, energy efficiency numbers were actually [below](#) their long-term average, despite the increased focus on energy transition.

The short-term focus on behavioural change as a means to lower gas demand should not let corporate decision-makers, households, and politicians shy away from the technological solutions that are needed to increase energy efficiency for a sustained period of time.

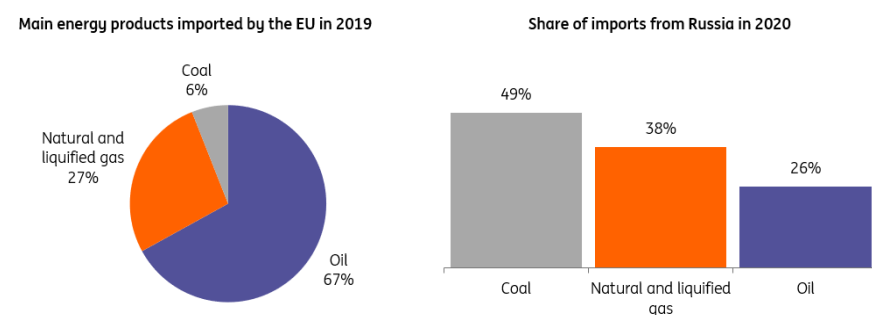
Dependency: don't substitute one dependency for another

So far, the discussion has very much focused on Russian gas, but European countries are also dependent on Russia for oil and coal imports.

Keep in mind that oil is the main imported energy product, making up two-thirds of energy imports, of which a quarter is sourced in Russia. Gas imports account for another 27%, of which 38% comes out of Russia. Coal imports only account for a residual fraction of European energy imports, but half of it comes from Russia.

An obvious mistake would be to substitute gas for coal or gas to oil, only to realise later that dependence on Russia has increased.

Russia is the main source of Europe's fossil fuel imports



Source: ING Research based on Eurostat

The dependency trade-off is not only about Russian energy carriers, but also about creating dependencies on other countries that might be politically sensitive. Coal, for example, can be sourced from China, while LNG can come from Qatar, or oil from Nigeria. Obviously, these are countries that Europe might also not want to become too dependent on.

Business as usual is no longer valid

There are only a handful of levers available to business leaders and households to reduce their gas demand in the short term. Switching gas to coal, lowering thermostats and – as a last resort – curtailment of production have the highest impact. These options are no silver bullet, otherwise they would have been implemented already.

Rising energy bills and the increased risk of supply chain disruptions from a reduction of Russian gas supply have put the topic high on the agenda of corporate decision-makers, policymakers and households. Business as usual is no longer valid. It was already invalid because of climate change. Now energy security and dependency add a new layer of urgency.

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