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Driven by high energy bills, Europe's efficiency measures also have a lasting effect

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Record energy prices across Europe seen last winter have resulted in residential and industrial energy users investing heavily in measures to bring down their energy consumption. This trend produced an unprecedented dip in energy demand across the Continent last winter. Here, energy journalist Karolin Schaps investigates whether the drop in consumption was a one-off phenomenon or if energy efficiency changes are having structural impact.

Global investments in energy efficiency reached a record high last year, with around \$285bn spent on making buildings more sustainable, according to the International Energy Agency (IEA). '[This] marks a strong increase in efficiency spending and electrification from the previous year and is the result of a continued effort, led by Europe, in response to the energy crisis triggered by the Russian invasion of Ukraine, along with policy and price-driven increases in spending in other countries,' the Agency said in its annual *World Energy Investment [report](#)*.

Russia's war on Ukraine erupted in February 2022 at a time when Europe's gas markets were already under supply strains, exacerbating a nervous trading environment that quickly resulted in extremely high gas and power prices for European consumers. Benchmark European day-ahead gas prices spiked above €300/MWh in late August 2022, compared to levels seen before the COVID-19 pandemic of around €10–20/MWh.

Gas savings

In response to high energy prices and Russia's influence on Europe's gas market as its main supplier, the European Union (EU) enforced a 15% reduction in gas demand between 1 August 2022 and 31 March 2023, compared to each member state's average consumption over the previous five years. Earlier this year, the measure was extended for another 12 months until 31 March 2024, but it remains voluntary. The one-year extension is expected to save roughly 60bn m³ of gas, more than the combined annual gas consumption of France and Belgium.

In a more far-reaching initiative, the EU adopted the revised Energy Efficiency Directive (EED) in July this year to deepen its energy efficiency target to 11.7% by 2030 versus a 2020 baseline. This equates to an annual reduction in total energy consumption of about 1.5%, underlining the ambition of the programme.

‘Since the Russian invasion of Ukraine and the long period of high energy bills, Europeans have realised that the best energy is the energy that is never consumed,’ says Jan Svoboda, Research Fellow on European energy at AMO, a non-governmental international relations organisation based in Prague. ‘Member states have definitely not been doing enough for a long time as energy efficiency improvements have been slowing down from the period of high gains from the early 2000s. With the progressive increase in annual energy savings introduced by the recently revised EED, this should now change,’ he adds.

Energy efficiency

Many EU member states have in recent months sweetened energy efficiency incentives that have and will help bring down energy demand. Out of 439 energy crisis measures identified in 2022 by the European Agency for the Cooperation of Energy Regulators (Acer), 55 were linked to energy efficiency

and energy savings programmes. The vast majority of these, 76%, were designed to have long-term impact.

Germany, for example, in January introduced a new subsidy scheme for climate-friendly newbuild projects, under which individual new houses can obtain loans of up to €150,000 to apply the highest climate-friendly energy efficiency standards. Italy's Superbonus programme has resulted in a near doubling of energy efficiency investments in the country between 2021 and 2022 to \$57bn. In April 2022, the Finnish government made €200mn available for energy efficiency investments in buildings, including the modernisation of heating systems that use renewable energy.

'Gas-saving measures enacted in public buildings, fuel-switching in households with the option, the installation of heat pumps, efficiency gains and behavioural changes all played a critical role in reducing distribution network-related gas demand,' found the IEA when analysing last year's record 13% drop in European gas demand.

The European Environmental Bureau found that Germany, Italy, France, Portugal and Spain had implemented the most robust energy-saving measures since the start of the energy crisis. These countries represent more than 60%, or 254bn m³, of the EU's annual gas demand, meaning that the 3% drop in gas use observed in these countries had a larger impact than the high percentage point reductions seen in smaller gas-using nations.

'These plans must be strengthened to ensure that the progress of the recent months becomes structural in the way each country uses its energy,' says Antonin Chapelot, Policy Advisor at the Coalition for Energy Savings, a Brussels-based non-for-profit association.

Outlook winter 2023/2024

Last winter alone saw a 12% reduction in EU gas demand on the average of 2019–2021, according to consultancy Bruegel, with significant contribution

from households in the months of October and November when weather conditions were comparatively mild. The European Commission (EC) reports the bloc achieved gas demand reductions of 18%, or 53bn m³, over the period between August 2022 and March 2023, the period over which a 15% reduction had been targeted.

Bruegel analysts expect this winter's gas demand to be another 3.3% lower than in 2022, at 74 TWh, driven by a combination of lower gas use in power plants and a record amount of newly installed heat pumps replacing gas-fuelled heaters. '[These] factors suggest the potential for gas demand to be structurally lower than last year,' notes Ben McWilliams, Affiliate Fellow in the field of energy and climate policy at Bruegel.

Heat pumps

The installation of heat pumps has been one of the main energy efficiency measures implemented across European households in recent years, especially in response to high energy bills. According to the European Heat Pump Association, an additional 3 million units were installed in 2022, bringing Europe's total stock of heat pumps to 20 million. Most units were sold last year in France, at 622,000, followed by Italy at 514,000 and Sweden at 215,000.

The IEA predicts that annual EU heat pump sales could rise to 7 million by the end of the decade, with the trend potentially reducing annual EU gas demand by nearly 7bn m³ by 2025 and 21bn m³ by 2030.

Germany, one of the EU countries historically most dependent on Russian gas imports, could reduce gas demand in buildings by almost 40% by 2030 if the country pressed ahead with plans to phase out gas and oil-fuelled boilers in favour of cleaner heating alternatives such as heat pumps. 'Germany could cut its spending on energy imports by €26bn between now and 2030, of which €19bn would be gas import savings,' say analysts at Cambridge Econometrics.



The wider adoption of heat pumps inevitably results in reduced gas use

Photo: LG

Price sensitivities

Although energy efficiency measures, such as heat pumps, installed over the past months are set to have a lasting impact on gas demand, the vast majority of reductions in energy consumption seen last winter were down to consumers reacting to price signals in the short term. Especially industrial users, which are sometimes able to adjust energy consumption relatively swiftly by fuel switching and production curtailments that have only temporary effect.

‘As gas prices are expected to stabilise at a level significantly below the peak prices of 2022, one can expect gas demand from energy-intensive industries that reduced production or switched to more carbon-intensive fuels (rather than structural energy efficient investments) to bounce back,’ the EC said in its *European Economic Forecast* report. The IEA noted an uptick in industrial gas demand in Europe in 3Q2023, but said that levels remained 15% below those seen before the energy crisis.

Short-term reactions to high prices also drove down residential gas demand last year, with the number of heating degree days falling by 8.3% in the period between August and December 2022 compared to the 2017–2021 average, according to EC data. ‘Heating of space represents, on average, around 63% of the final energy consumed by households in the EU; lowering heating is, thus, an impactful way for households to reduce their energy consumption,’ the EC said.

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Structural shift

Gas is set to continue playing a crucial role in Europe’s energy landscape, but its use has peaked on the Continent and is expected to drop by 20%, or 110bn m³, below 2021 levels by 2026, according to the IEA. In the residential and commercial sectors, energy efficiency gains will have a growing impact on reducing gas demand, especially through the rapid installation rate of electric heat pumps.

However, European governments need to considerably step-up energy efficiency improvements, especially under the newly tightened EED target which will show substantial effects only in the long term.

‘In part, steep demand reduction can very well be associated with recent energy efficiency regulatory measures since the unfolding of the energy crisis. However, full policy effects may materialise on longer time horizons,

whereas the immediate effects can be construed as industries' and residential consumers' reaction to extreme price signals,' comments Géza Losonczy, Associate Partner and Sector Head for the Energy, Power & Utilities division at KPMG in Hungary.



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The image consists of two promotional banners. The top banner is for 'EnergyAware', a program created by the Energy Institute. It features a green lightbulb icon with a lightning bolt inside, symbolizing energy awareness. The text states its purpose is to help reduce energy use, costs, and emissions at home and in the workplace, and provides the website energy-inst.org/energyaware. The bottom banner is for 'ENERGY MANAGEMENT TRAINING'. It features a background image of modern glass skyscrapers. A dark blue curved banner at the top of this section contains the text 'ENERGY MANAGEMENT TRAINING'. Below this, an orange button with white text says 'Explore all courses'. In the bottom right corner, the Energy Institute logo is displayed, consisting of a stylized orange 'e' and the words 'energy institute'.