

# The age of energy rationing is looming for Britain

## Description

UK warned of blackout risk as nuclear power shrivels and Ed Miliband races towards net zero  
[Jonathan Leake. Matt Oliver](#) Industry Editor

It was the warning Ed Miliband didn't want to hear.

Days after the Energy Secretary pledged low-carbon power for all at Labour's annual conference, energy giant EDF discussed plans to close four of the UK's five remaining nuclear power stations.

Two are currently scheduled to close in 2026, followed by another two in 2028.

"They can't go on forever," said Rachael Glaeving, commercial director at EDF's UK business.

"Any life extension of these power stations is going to be measured in months."

The decision, announced after thorough engineering reviews, is set to make Miliband's dream a lot harder. He has promised to deliver a net zero power grid by 2030, although in practice this is expected to mean 95pc green energy – with the remainder coming from burning gas.

Eventually, if the Government succeeds in [the scale of wind and solar farm construction envisaged](#), it could lead to an abundance of energy.

But in the nearer term, some fear the breakneck pace of change could stretch the grid to the limit. In September, [the country's last coal-fired power station, at Ratcliffe-on-Soar, Nottinghamshire, closed](#).

As Britain's reactor fleet shrivels, the amount of nuclear capacity will fall from six gigawatts (GW) today to just 1.2 GW by 2028 or soon after. Along with rising demand from power-hungry data centres and technologies of the future, it will make it even harder to keep the lights on when wind and solar generation is low.

Against this backdrop, the National Energy System Operator (Neso), the newly nationalised body overseeing the electricity grid, is turning to households and businesses to help balance the system.

Last week, it announced year-round plans to manage demand by [paying consumers to cut their electricity usage](#) at times of tight supply.

The so-called demand flexibility service has been billed as a forward-looking way to manage an increasingly complex and "smart" system, as we move from using a small number of large coal and gas-fired plants to relying on a plethora of intermittent sources of wind and solar power – backed up by batteries, [energy-storing giant flywheels](#), interconnectors and other gadgets.

Yet some critics warn this all looks strikingly similar to rationing, especially coming at a time when

electricity production continues to fall.

That could prove politically perilous for Miliband and Labour, with the next general election due in 2029. The party has pledged that its policies will cut energy bills by up to £300 per year.

Miliband's opponents believe his approach [risks destabilising Britain's grid](#), threatening jobs and businesses in the process.

Meeting the net zero 2030 target will be "very expensive, present increased risk of blackouts and involve fudges", argues Kathryn Porter, an independent energy analyst and founder of Watt Logic.

"It's also likely that a significant demand side response would be needed," she says. "But getting businesses and households to routinely reduce demand will have significant adverse economic and welfare impacts."

Energy rationing appears to be looming – but will the country tolerate it?

## Winds of change

Since the turn of the century, electricity production in Britain has fallen by about one quarter, according to figures from the International Energy Agency. That compares to almost no change in the average across the European Union.

In the coming decades, demand for power is set to skyrocket as net zero policies lead us to switch away from fossil fuels towards electricity. Heat pumps and electric vehicles will replace gas boilers and petrol cars, while heavy industry is considering embracing [mini-nuclear reactors](#).

According to the independent Climate Change Committee, demand for electricity is forecast to grow from around 300 terawatt hours today to more than 350 terawatt hours by 2030, and 600 terawatt hours by 2050.

That means supply has to ramp up dramatically. The Government wants to do this through a combination of renewable sources such as wind and solar, nuclear power and storage solutions such as hydro dams and batteries, which can release electricity at times when renewable energy generation is low.

But in the near term, ministers face a problem. Over the years, we have steadily switched off old nuclear power stations, which used to provide a steady source of power. So-called dispatchable plants fuelled by coal and gas have also disappeared, meaning they can no longer be fired up to plug gaps in supply in a pinch.

With four of Britain's five nuclear plants set to go around 2028, the nuclear output that has been the stable bedrock of the national grid will also plummet.

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Hinkley Point C, the only new nuclear plant under construction, is not scheduled to come online until

2030 at the earliest, with 2031-32 seen as more likely.

All this means that, towards the end of this decade, Britain's grid will be increasingly dependent on burning gas to plug any gaps. Yet this power source is also falling out of favour.

One answer to this problem is obvious: build more renewables. And Britain has been adding vast quantities of renewables to its supplies for more than two decades.

Since 2000, the country's theoretical generation capacity has increased from 75 GW to 106 GW thanks to the building of new wind and solar farms.

So why has electricity generation fallen?

The answer lies in the intermittent nature of renewables, which cannot produce power if the wind isn't blowing or the sun doesn't shine. This means the actual amount of power such projects generate is different to their theoretical capacity.

Wind turbines in the UK typically have a "load factor" – the percentage of the time they actually generate – of about 30pc, according to lobby group RenewableUK. For solar panels, the load factor is around 10pc, according to the Government.

As a result, to deliver on the Government's goal to decarbonise, renewables must be "over-built" to ensure there is always a comfortable margin of supply, even in low wind and low-light conditions. At least for now, they must be backed up by power stations burning gas – the costliest form of generation – until better alternatives can be deployed.

This has consequences. On the supply side, it means gas is often called on to plug supply gaps at short notice. Neso has also stepped up its use of interconnectors with Europe, which trade electricity with the Continent. Roughly 6pc of electricity is expected to come from these cables during the peak of winter.

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This deals with the supply, but Neso is also seeking to manage demand.

Perhaps the largest system already in use is "demand side response", a scheme for heavy industry. Under this scheme, businesses are paid for cutting their energy consumption at times when the grid is under pressure.

These deals are private, meaning data is limited. But one study suggested the system could allow grid managers to cut industrial consumption by up to 3 GW – roughly equivalent to two large power stations.

Such arrangements may work well for the companies involved, but the benefits for the British economy are more dubious. Factories, warehouses, and other large-scale businesses are paid to halt production to help keep the country's lights on, rather than engaging in economically productive activities.

Supporters say much of the reduction is achieved through relatively harmless decisions, such as

turning off industrial-grade freezers for an hour or so, for example.

But to others, it flies in the face of what some economists have suggested we should really be aiming for: energy abundance.

One senior energy industry source says: “We are turning off consumers and industries because we can’t provide the power that’s needed.

“It’s like South Africa [which has frequent power cuts], but people here are trying to make a virtue out of it. Demand side response is a euphemism – what it really means is supply-side failure.”

Tone Langengen, a net zero expert at the Tony Blair Institute for Global Change and a former energy department official, warned against moves towards anything that resembles “stifling demand” for power earlier this year.

Along with another academic, she argued that Britain should instead aim for “energy abundance” by building a large fleet of new nuclear power stations.

“The principle must be that we need to have enough power to enable all the new things we want to build and new industries that want to settle here to get access to power quickly and easily,” Langengen tweeted.

“If your starting point is, as it is for many, that you want to get to clean power as quickly as possible at any cost, it could potentially lead you down a different route where rising demand is seen as a problem.”

## **Feast or famine**

Controlling demand is, however, likely to become an ever greater feature of the UK’s national grid.

“At some periods of time, under the future envisaged system, we will have abundant electricity like you’ve never seen before,” says Jason Mann, an energy markets expert at FTI Consulting.

“We are talking about such vast quantum of it that you won’t be able to consume it all. But other times we won’t – and that’s the problem.”

What grid controllers dread most of all are periods of “dunkelflaute”: spells of cold, cloudy, windless winter weather when turbines stop turning, solar output plunges and demand soars as people turn on lights and electric heating.

Last week Neso announced plans to expand its “demand flexibility service” – where it pays people to cut consumption – from just the winter into a year-round offering.

Under the scheme, households and smaller businesses with smart meters can agree to cut consumption at peak times and get a payment for it.

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The scheme was originally part of the UK's response to the energy crisis caused by Russia's invasion of Ukraine and operated only in winter. Last winter saw 2.4m households and businesses sign up, double the previous year's total.

It was put into action twice, delivering demand reductions of 300-400 megawatts, equivalent to a medium-sized power station.

An Ofgem report said the scheme could be "a foretaste of a net zero future in which demand-side measures are expected to play a far greater role in our energy system".

To many energy experts, flexibility schemes are a good thing if they do not become crutches.

They view the issue as a technology problem that can be solved with clever computer software – coupled with storage solutions such as batteries – that can shift the demand of certain consumers to times when supplies are booming and reduce or pause consumption when the grid is stretched.

"That's why demand flexibility is very desirable, because we can push demand into times when we have an abundant amount of electricity," Mann, at FTI, says.

"By doing that, we move it away from periods where it's not windy and not sunny, and therefore scarcer. So in that sense, it is being smarter about how we consume."

Still, with supplies of dispatchable power set to be constrained towards the end of this decade, some worry that it will be tempting for politicians to seek to crush demand to help meet net zero targets.

"You're not going to get to net zero by getting people to turn their lights off," says Mann. "That's ridiculous. You have to get there by being smart and using tech to flex demand in a way that consumers hardly notice."

## Painful prices

Factories and families alike are being asked to change the way they use power while also shouldering some of the highest costs in the developed world.

The UK industrial electricity price was four times higher than in the US, and about two fifths higher than in France and Germany, data published by the Government last month showed.

Consumers, meanwhile, are also feeling the pain. Official data also showed that domestic electricity prices in the UK were 80pc above the average and nearly three times as much as what American households paid.

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What has driven all these costs so high? Many experts blame the high dependence of Britain's electricity system on gas, which was used to generate 34pc of our electricity last year.

Gas is still used to set prices for all forms of electricity most of the time – and the price of it has surged following Russia's invasion of Ukraine, which caused widespread supply chain upsets.

But the decision to “drive faster than anywhere else” on the rollout of renewables is also to blame, argues Malcolm Keay, a senior fellow and electricity market expert at the Oxford Institute for Energy Studies.

“The cost of renewables is folded into prices,” he says, through levies on bills. “It has required a lot of investment, and that investment is being paid for by consumers.”

Levies help underwrite the construction of new green power plants, while the cost of building new electricity pylons and miles of overhead wires to connect disparate wind and solar farms to the grid is also added to bills in the form of network charges.

Keay stresses that the cost of renewable power sources has come down gradually over time. But because many existing projects were built at higher historical costs and still receive subsidies, consumers are yet to feel this improvement – and will continue paying them off for years to come.

For example, the renewables obligation cost about £7bn in the 2023/24 financial year. Costs are expected to peak at £8.4bn in 2026/27, according to the Office for Budget Responsibility.

“We haven't really had the benefit of renewables yet,” Keay adds.

As prices have risen, the UK's poorest households have plunged into ever greater debt. Data from Ofgem shows that customer debt for power and gas bills combined rose from £2.6bn to £3.7bn between June 2023 and June 2024.

For many of the 4m households on pre-payment meters, this leads to de facto rationing in the form of self-disconnection. This is when households simply stop paying, meaning their electricity and gas stop working, leaving them in the cold and dark till they can afford to add some credit.

Ofgem data show that in the winter of 2022 about 280,000 households self-disconnected at least once and for longer than three hours – many for far longer.

Supporters of the Neso's separate demand flexibility service, which is voluntary and compensates households for cutting consumption, say it is very different and is, in fact, a “win-win”.

But along with the introduction of “time of use” tariffs, which vary prices every half an hour based on demand, it heralds a new era in which households will need to become much more conscious of not just how much power they consume [but also when they use it](#).

“As we're going for more and more renewables, there's going to have to be more flexibility somewhere else in the system, and demand flexibility is one possible source of it,” says Oxford's Keay.

“Market reforms which might seem to lead to rationing or lower reliability are things that the



Government has found very, very difficult to consider.

“But frankly, I think we’re inevitably going to go in that direction. And the issue is more about trying to find sensible ways of doing it that people can live with.”

## ‘Aggressive’ net zero goals

Is there an alternative? Some argue that Britain can shield households from crippling costs and blackouts more effectively by reforming electricity markets.

At the moment, the entire country falls under a single electricity price – despite the fact the grid is, in reality, made up of different regions that each have differing levels of generation and infrastructure.

Breaking up the single market [to let each region set their own price](#) would theoretically lead more wind and solar farms to be built closer to where they are needed – cutting the amount of new power lines needed and tackling bottlenecks more efficiently, according to supporters such as Octopus Energy.

Overall, this could cut bills for every household, stimulate more renewable construction and thereby address supply issues.

“Locational pricing makes it easier, by quite a margin, to get prices down for consumers,” FTI’s Mann says. “You are talking about £100 to £150 off bills per year.”

But regional pricing would mean accepting a politically risky situation where people in the South East still pay more for their power than those living elsewhere.

At the same time, the idea faces stiff opposition from wind farm developers that argue it will inject uncertainty into their business models and undermine investment.

Factory owners, represented by manufacturers’ body Make UK, are also concerned they could be “penalised” for owning plants in areas where prices are higher.

Making sure people can still consume the power they need for a reasonable price remains the overriding priority of the Government. But there is debate within the energy industry about whether racing towards the goal of clean power by 2030 helps or hinders that objective.

By shutting down fossil fuel-powered generators faster than we are ramping up the necessary capacity to replace them, Britain becomes more and more reliant on imports. That means we must pay the market price for our power.

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“Around 15 years ago the UK was a ‘price maker’ for the gas we use to generate electricity,” says Michael Tholen, policy director at Offshore Energies UK, a trade body for the wind, oil and gas industries.

“We are now a ‘price taker’ as we are no longer a net exporter of gas and import ever more from

countries such as Norway, Qatar and the US.”

Other European countries have avoided that trap. Chris Wilkinson, a senior electricity analyst at Rystad Energy, a global energy consultancy, said France’s commitment to nuclear and Norway’s focus on hydroelectricity had given each of those countries a degree of immunity from volatile global gas prices that Britain could only envy.

Offshore wind was, he said, the UK’s best hope of gaining similar protection – but Mr Miliband’s ambitious 2030 target risked making him a hostage to fortune.

“I think the Labour renewable targets are too aggressive,” Wilkinson says.

Claire Coutinho, energy secretary during the Conservative government’s final year in power, and now shadow energy spokesman, admits that she and her Conservative colleagues left the country and Mr Miliband with a legacy of high energy prices.

“In office I argued for more gas power plants, more nuclear and an end to putting green levies on people’s bill. Cheap, stable energy has to be the priority.

“The truth is, our overall approach over 14 years did not have enough of a relentless focus on a cheap energy system overall,” she says.

But she claims Labour’s decision to speed up the switch to a clean power grid will end up costing consumers even more. “Ed Miliband’s plans are about to turbocharge our prices and destabilise our energy security. That will just move businesses abroad to more polluting countries. It’s madness.”

Sam Hollister of LCP Delta, a leading energy consultancy, says: “I think there is absolutely zero chance of this happening by 2030 and everyone in the industry knows this.”

LCP Delta’s own research suggests that the UK may get some way towards that target by 2030 – but gas will still be fuelling the systems for at least 25pc of the time by then, and possibly a lot more.

Only by the mid-2030s might that change, especially if Hinkley Point C nuclear station comes online.

It points to the political trap Mr Miliband could be setting himself. The emerging consensus is that he is doing many of the right things to boost the UK’s energy security and decarbonise the grid, but he is doing them much too quickly.

The next election is due in 2029, by which time he may have seen thousands of new wind turbines installed. Yet he will also have lost most of the UK’s nuclear capacity and some of its gas-fired power stations too.

Gas will still be governing the UK’s electricity prices, limiting the ability to lower prices – and the grid will be less stable.

High energy prices alone will be enough ammunition for political rivals to undermine him, especially given his pledge to cut bills by £300. But if that’s compounded by even a hint of blackouts or power shortages, both he and Labour risk a voter backlash.



An Energy Department spokesman said the 2030 decarbonisation target would remain: “The sharp increase in electricity prices in recent years was driven by the rise in global gas prices, and a reliance on volatile fossil fuels.

“The best way to protect billpayers from future price shocks and boost Britain’s energy independence is through homegrown clean energy and our mission is for clean power by 2030.”

Dieter Helm, professor of economic policy at Oxford University who has advised previous administrations, expects energy to be a key issue at the next election, with both the Conservatives and Reform likely to target the net zero and decarbonisation agendas.

“When a government commits to a path to net zero in electricity at breakneck speed within just five years, brands those who might stand in the way as Nimbys, and sets out a rhetoric of confrontation, there is bound to be a reaction,” he wrote in a blog this week.

Mr Miliband and his allies “trot out nonsense” about gas and make “silly statements” about renewables, he claimed.

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## **Category**

1. Background Comment

## **Date**

13/12/2024

## **Date Created**

14/10/2024