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Britain's gas dependency: A growing vulnerability

By Jack Richardson

EXECUTIVE SUMMARY

- The United Kingdom (UK) has a high dependence on volatile international gas markets for its electricity and heating. This is a strategic weakness which undermines British economic stability and growth.
- Ongoing domestic gas production is necessary, but insufficient to reverse this weakness. In practice, Britain will remain a price taker with prices determined by the actions of other governments, no matter the production policy.
- Reducing consumption is therefore necessary. His Majesty's (HM) Government must diversify its electricity and heating supply to reduce exposure to markets it cannot meaningfully influence.

His Majesty's (HM) Government is cutting spending and seeking efficiencies to improve the British fiscal position as it increases defence spending for the long term. But, the United Kingdom's (UK) very high dependence on gas means HM Treasury is always exposed to fluctuations in the gas markets: large price spikes mean the Exchequer has to provide direct support to people and businesses. In response to the gas price spike related to Russia's full-scale invasion of Ukraine in February 2022 and the Covid-19 pandemic, HM Government spent £40 billion – approximately three quarters of the 2023-2024 defence budget – in energy price support.[1] This amount was only a fraction of the original estimate of £139 billion.[2]

The intuitive answer would simply be to produce more gas. But HM Government cannot insulate the economy and public from gas price shocks through increased domestic gas production alone for two reasons:

1. The UK does not possess sufficient gas resources to increase production because of high levels of consumption, which only became so high due to a state campaign to install gas appliances backed by plentiful reserves – which are now vanishing;
2. The UK is, in practical terms, irreversibly integrated into the European gas market. This means that British gas prices are set at the European level. Europe's gas price is also being globalised through liquefied natural gas (LNG) markets.

Without a reduction in consumption, the UK remains exposed to volatility in the gas markets. Gas market volatility should be considered as all but guaranteed in a politically volatile world, because geopolitics and energy supply are inseparable. Britain's welfare is entirely at the mercy of decisions made by other governments – friendly or otherwise, for better or for worse.

This Explainer outlines how natural gas has moved from a strength to a strategic weakness for the UK. A second Primer will present a route to reducing the nation's dependence on gas through electrification.

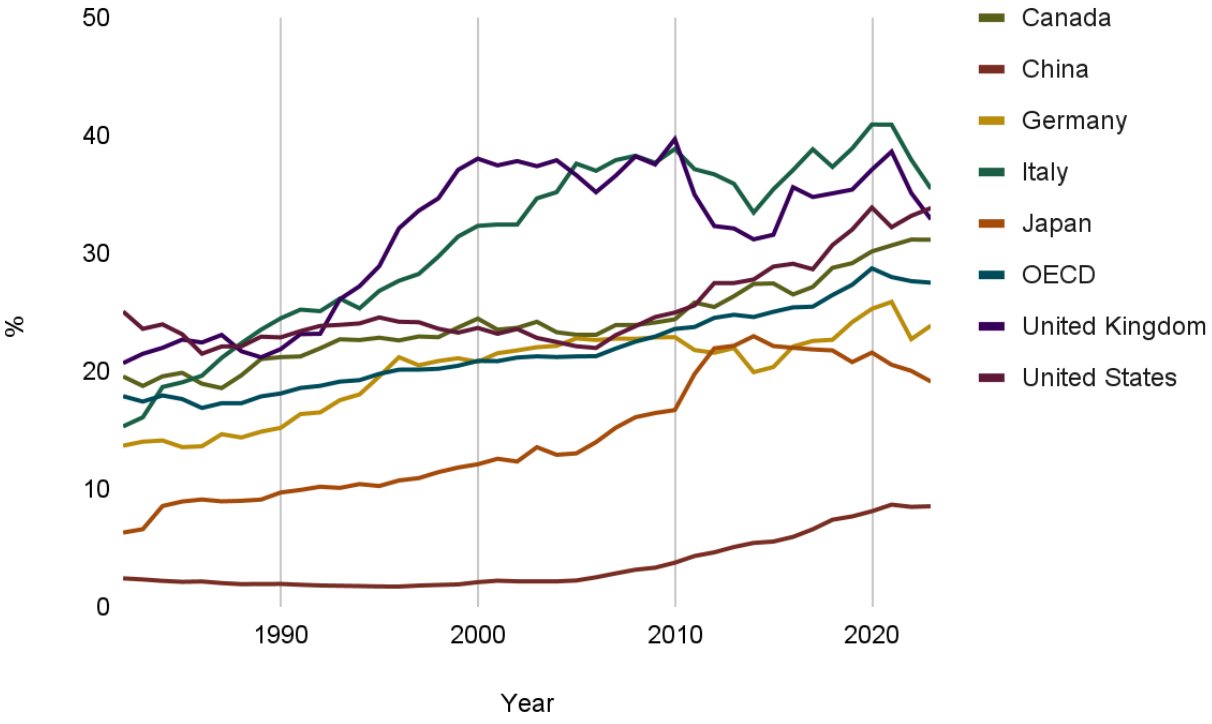
Britain has become very reliant on imported gas

As shown in Graph 1, despite a large renewables programme, Britain remains highly reliant on gas, which provides a third of its total energy consumption.[3] It is

[1] '£40 billion spent protecting families and businesses from energy costs', Department for Energy Security and Net Zero, 08/06/2023, https://www.gov.uk/ (checked: 07/04/2025), and Esme Kirk-Wade, 'UK defence spending', House of Commons Library, 04/12/2024, https://commonslibrary.parliament.uk/ (checked: 07/04/2025).
[2] 'Energy bills support schemes "undoubtedly successful at protecting majority of consumers"', National Audit Office, 14/11/2024, https://www.nao.org.uk/ (checked: 07/04/2025).
[3] 'United Kingdom', International Energy Agency, No date, https://www.iea.org/ (checked: 07/04/2025).

currently the third most gas dependent of the Group of Seven (G7) nations, and in absolute terms is the 11th largest gas consumer in the world, just ahead of India.[4] The United States (US) only recently overtook the UK in gas dependency, around two decades into its 'shale revolution', which cut its gas imports by a third between 2007 and 2022.[5] Italy is slightly more dependent than Britain, and has likewise been punished economically by high gas prices.[6]

GRAPH 1: GAS DEPENDENCY (% OF GAS AS A SHARE OF PRIMARY ENERGY)



Britain imports approximately half of the gas it consumes. The high dependence is because gas provides most of the UK's space heating and industrial processes, and much of its electricity production, following a transition from coal to gas.[7]

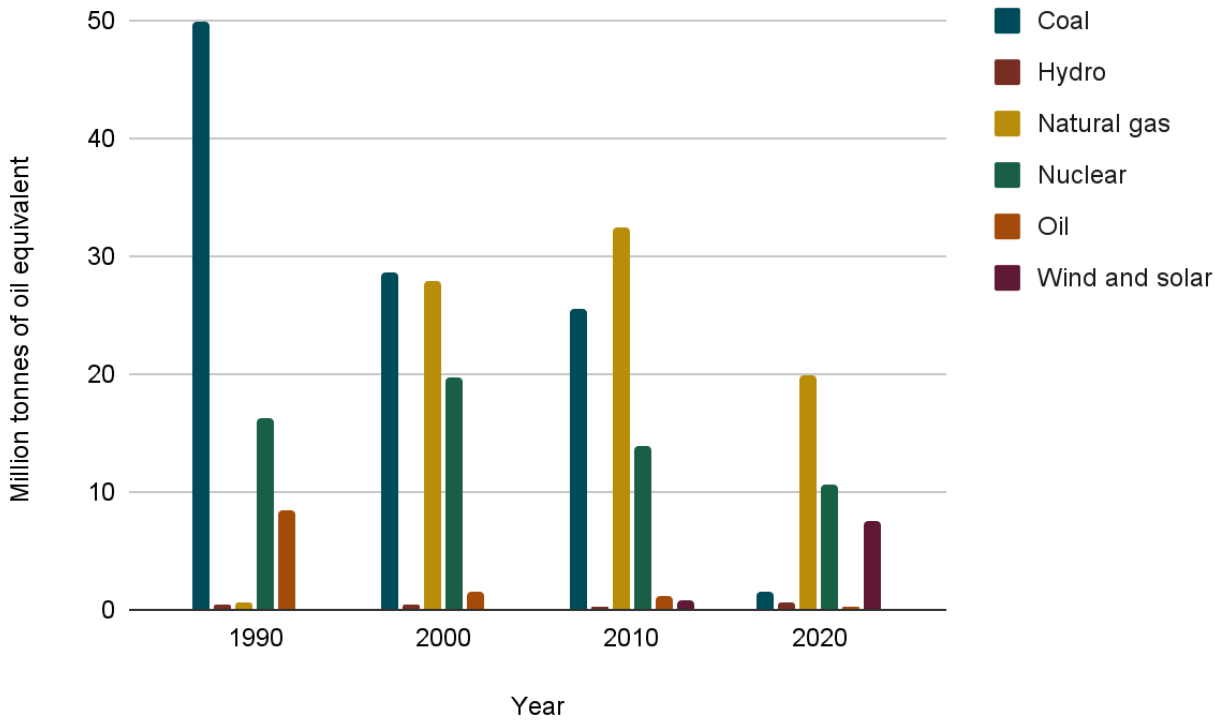
Britain did not transition from coal to gas through market forces alone. Following the discovery of North Sea natural gas in 1965, the then-nationalised energy industry conducted a concerted campaign to convert 40 million domestic

[4] 'Gas consumption', Our World in Data, No date, https://ourworldindata.org/ (checked: 07/04/2025).
[5] 'Natural gas explained', Energy Information Administration (US), No date, https://www.eia.gov/ (checked: 07/04/2025).
[6] 'Share of primary energy consumption that comes from gas', Our World in Data, No date, https://ourworldindata.org/ (checked: 07/04/2025).
[7] That is, coal-produced heating either directly or through coal-produced town gas and coal-fired power generation.

appliances in ten years from town to natural gas, despite a sceptical public.[8] Margaret Thatcher, then Shadow Minister for Fuel and Power, argued in Parliament that 'the cost of getting the gas to their homes and of converting the equipment in their homes is so great that it will negate the advantages of the cheaper raw material [natural gas]'.[9]

Later, in the 1990s, the privatisation of electricity led to gas-fired power production, pushing coal and nuclear power production off the grid and rising by a factor of 50 over the decade (see: Graph 2).[10]

GRAPH 2: FUEL FOR ELECTRICITY GENERATION



Transitioning from coal to gas made sense, given the UK's abundant North Sea gas reserves. For a short period (1994 to 2004), despite a high consumption of gas, Britain was a net exporter.

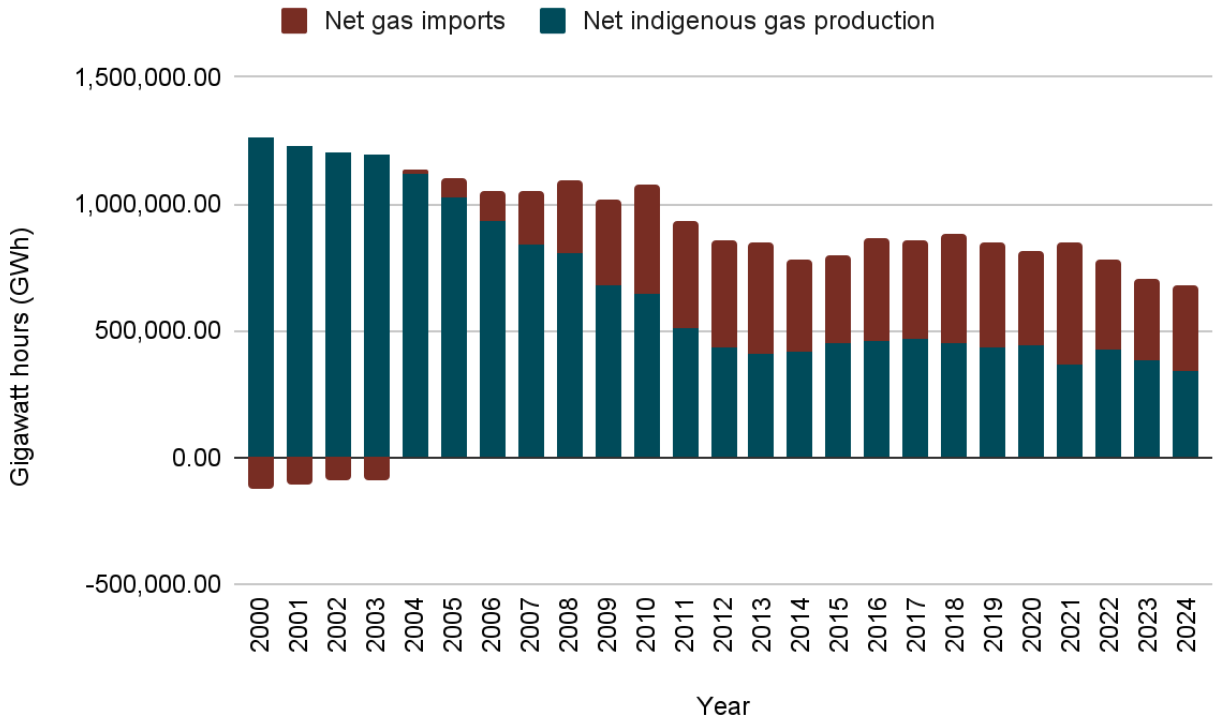
But the picture is different 20 years later. As shown in Graph 3, indigenous gas production has fallen 70% from 2000 to 2023.[11] The UK's North Sea gas reserves

[8] Sam Johnson-Schlee, '"Brighter lives are lived by gas!": how natural gas was sold to a sceptical public in post-war Britain', *The Conversation*, 05/10/2022 https://theconversation.com/ (checked: 07/04/2025).
[9] Margaret Thatcher, Speech in the House of Commons, Hansard, 22/05/1968, https://api.parliament.uk/ (checked: 07/04/2025).
[10] Nuclear power continued to receive subsidies to protect it from being undercut, but Britain's nuclear fleet is now in decline despite the ongoing construction of Hinkley Point C. See: Simon Taylor, *The Fall and Rise of Nuclear Power in Britain: A history* (Cambridge: UIT Cambridge, 2016).
[11] 'Digest of UK Energy Statistics (DUKES)', Department for Energy Security and Net Zero, 30/07/2024, https://www.gov.uk/ (checked: 07/04/2025).

began to dry up from 2004 (before the Climate Change Act 2008); the basin has been described as 'supermature' for a decade now.[12] 180 of the 283 active oil and gas fields are set to cease production by 2030.[13]

Demand for gas over the same period, however, only fell by less than 37%.[14] This means that Britain now consumes double the gas it produces. It has therefore become highly dependent on imported gas, which has risen by a factor of 27 since the turn of the millennium.

GRAPH 3: NET GAS IMPORTS VERSUS NET INDIGENOUS GAS PRODUCTION



Today, over half of the UK's imported gas – over one third of its consumption – is supplied by Norway via pipelines. Up to 70% of Norwegian piped gas reaches Britain via a single pipeline: the Langeled. This is in itself an acute security

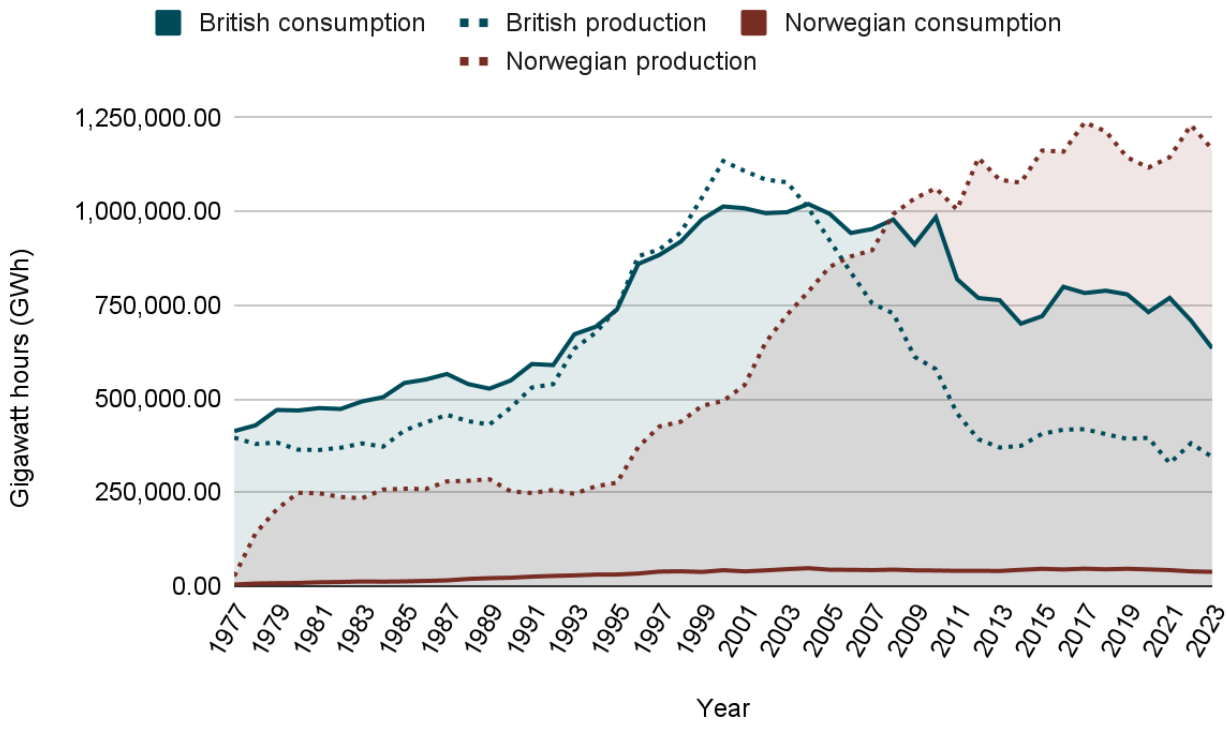
[12] Erikka Askeland and Niamh Forrest, 'North Sea hits "super-maturity" as Oil & Gas UK calls for big tax cuts', *Energy Voice*, 23/02/2016, https://www.energyvoice.com/ (checked: 07/04/2025).
[13] 'Hundreds of new North Sea oil and gas licences to boost British energy independence and grow the economy', Department for Energy Security and Net Zero, 31/07/2023, https://www.gov.uk/ (checked: 07/04/2025).
[14] 'Digest of UK Energy Statistics (DUKES)', Department for Energy Security and Net Zero, 30/07/2024, https://www.gov.uk/ (checked: 07/04/2025).

vulnerability.[15] Were the Langeled sabotaged, the UK would face an energy crunch and become reliant on the spare capacity of its LNG terminals.

Norway, blessed with abundant hydropower capacity as well as oil and gas, has taken a different approach to fossil fuels than Britain. Rather than purposefully transitioning its heating supply to consume the gas it produces for domestic consumption, Norway sells most of its gas and puts the proceeds into its sovereign wealth fund.

Norway now produces three times more gas than the UK, and 41 times more gas per capita, but Britain consumes 16 times more, and a third more per capita (see: Graph 4).[16] Norway uses far less gas for space heating and power supply, so it is more insulated from gas price spikes than the UK – although electrical interconnections to Britain and Europe mean it does import some price volatility from gas price spikes and low renewable output.

GRAPH 4: BRITISH AND NORWEGIAN GAS PRODUCTION AND CONSUMPTION



The UK has also turned back to shipped LNG. LNG imports had ceased for a few decades thanks to expanding North Sea production, but returned as domestic production fell in the 2000s, with new terminals becoming operational in 2005 and

[15] The Langeled has an annual capacity of 25.5 billion cubic metres (BCM) of gas, approximately 20% of the UK's demand. 70% of Norwegian gas is the provisional figure for 2024. See: 'Energy trends: UK gas', Department for Energy Security and Net Zero, 27/03/2025, https://www.gov.uk/ (checked: 07/04/2025).
[16] 'Norway', International Energy Agency, No date, https://www.iea.org/ (checked: 07/04/2025).

2009. Today, the US is the UK's second largest supplier of gas – providing a quarter of all imports – followed by Qatar, Peru and seven far smaller suppliers.[17]

Since LNG re-entered the British market, it has risen to be three quarters as large a source as piped gas from Norway, and 55% as large as domestic production. Over recent years, the UK has acted as a gateway to Europe, particularly for American shale gas, and especially following Russia's invasion of Ukraine in February 2022. But with competition for cheaper Norwegian gas from the continent, shrinking domestic production and stubbornly high consumption, Britain's dependence on globally traded LNG is likely to continue growing.

Gas dependency as a strategic vulnerability

The UK's high dependency on gas is a strategic weakness in a more volatile geopolitical age. Oil and gas price shocks raise the price of utilities, chemicals and food. Being a price taker for most of its energy (both oil and gas) means price shocks can cause severe and politically potent damage to Britain's finances and its real economy, draining the Exchequer and British current accounts.[18] Globally, gas is now a seller's market, and the UK's position as a price taker with uncertain financial resources is not a secure one.

This strategic weakness was exploited as Vladimir Putin, President of Russia, constricted the gas supply to Europe from autumn 2021. Although Britain imported little gas from Russia directly, constriction from the European gas market's Russian gas supplies meant that the pence per kilowatt hour cost of gas and electricity in the UK was still more than double the 2018 price in 2023.[19] This forced HM Treasury to pay £40 billion in financial support to people and businesses in order to avoid recession.

Gas prices have, on the whole, fallen from their peak in 2022 due to a reduction in demand for gas, and a forced diversification of European supplies from Russian piped gas, largely to LNG shipped from overseas. A colder than expected winter and low renewable output leading to the depletion of European gas storage caused another small price spike in February 2025.[20] Europe will need an additional 21 billion cubic metres (BCM) of gas to reach its 90% storage target, keeping costs higher than forecast.[21] Luckily, a warmer winter in Asia prevented a price war

[17] 'Digest of UK Energy Statistics (DUKES)', Department for Energy Security and Net Zero, 30/07/2024, https://www.gov.uk/ (checked: 07/04/2025).
[18] Oil and gas together represent around three quarters of UK energy demand, but Britain is a price taker for both. See: 'United Kingdom', International Energy Agency, No date, https://www.iea.org/ (checked: 07/04/2025).
[19] 'International energy price comparison statistics', Department for Energy Security and Net Zero, 27/03/2025, https://www.gov.uk/ (checked: 07/04/2025).
[20] Francesco Sassi, Post on X, 10/02/2025, https://x.com/ (checked: 07/04/2025).
[21] Thierry Bros, Post on X, 03/03/2025, https://x.com/ (checked: 07/04/2025).

between the two continents for limited LNG supplies.[22] The People's Republic of China (PRC) reportedly may even be minded to resell some of its spare LNG capacity to Europe, given its imports were at their lowest since the pandemic.[23]

But the flexibility of LNG capacity compared to piped gas provides as much of a threat to Britain and Europe as the lifeline it provides currently. LNG tankers can turn suddenly in the middle of the ocean to fetch the highest prices for their cargo. In other words, the UK's reliance on LNG means that the 85% of British households which use gas boilers for their warmth and cooking will now always compete with Asian factories for their winter fuel.

In the future, this could become even more of a problem as greater Asian consumption of Middle Eastern and American gas means more competition. The PRC's demand for LNG has consistently grown, and will likely continue despite the recent dip. Like Britain, the PRC's second largest supplier is also Qatar. India, which is ten times closer to Qatar than the UK in terms of nautical miles (thus incurring lower transport costs), is expected to become the third largest market in the world for LNG, with demand forecast to more than quintuple by 2050.[24] Japan and other Asian economies have promised to buy more LNG from the US, Britain's largest LNG supplier.[25]

However, there remains a good chance of an unprecedented LNG glut in the late 2020s as LNG export capacity in the US increases.[26] This could lower prices in Europe and the UK, and would mean more gas is coming from an ally. Importantly, this LNG would come over the Atlantic, with less coming through the strategic chokepoints of the Red Sea and the Strait of Hormuz.[27]

Yet, recent events suggest the US might not be completely dependable as an economic ally or trading partner, as it is clearly willing to use dependence on its resources to apply economic pressure against allies. Growth in energy demand for American Artificial Intelligence (AI) might reduce the amount of gas available for export, or at least push its price up as LNG exporters compete with technology companies. There are also concerns within the American energy industry that US shale production is entering its twilight years.[28] And the promises of Donald Trump, President of the US, to keep energy bills low are at odds with his LNG export policy.

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[22] Stephen Stapczynski, 'Asia's Tepid LNG Demand Provides Respite for Gas-Hungry Europe', *Bloomberg*, 15/01/2025, https://www.bloomberg.com/ (checked: 07/04/2025).
[23] Sing Yee Ong and Stephen Stapczynski, 'China LNG Imports at Lowest Since Covid Hit Demand in 2020', *Bloomberg*, 03/03/2025, https://www.bloomberg.com/ (checked: 07/04/2025).
[24] 'Industrial demand, shrinking production fuel rise in Indian LNG imports', Wood Mackenzie, 02/02/2025, https://www.woodmac.com/ (checked: 07/04/2025).
[25] 'US LNG May Get a Big Boost from Asian Importers Over Trump Tariff Threat', Institute for Energy Research, 30/01/2025, https://www.instituteforenergyresearch.org/ (checked: 07/04/2025).
[26] Josh Runciman, 'Risks mount as World Energy Outlook confirms LNG supply glut looms', Institute for Energy Economics and Financial Analysis, 15/11/2024, https://ieefa.org/ (checked: 07/04/2025).
[27] When Iranian-backed Houthi rebels attacked shipping in the Bab-el-Mandeb Strait, LNG tankers had to reroute around the Cape of Good Hope, adding extra transport costs and making routing to Asia more profitable.
[28] 'The world will be in a supply crisis with the twilight of US Shale, says Ninepoint's Eric Nuttall', CNBC, 13/03/2025, https://www.cnbc.com/ (checked: 07/04/2025).

The UK is also still at risk of future strategic constriction from Russia due to Britain unavoidably being part of the European gas market. In Europe, Alice Weidel, Leader of Alternative für Deutschland, promised to restore piped gas supplies to Europe from Russia,[29] a move which people close to Trump reportedly support.[30] Europe is still dependent on Russian LNG, so a conclusion of the war in Ukraine could easily encourage much financially cheaper – but politically laden – piped Siberian gas imports to recommence.[31] This would place Europe and Britain's energy security in the hands of Putin once again.

Purposefully or not, for better or for worse, the UK's economy and welfare will remain exposed to decisions made elsewhere until its gas dependency is reduced. It might be the case that Britain sometimes benefits from cheap gas in the future, but it is at least equally as likely that the country will experience further damaging price shocks. Money spent on emergency energy price support takes away from other government spending, including military and security, and harms economic growth.

The UK will not produce its way out of vulnerability; diversification is necessary

There are good reasons for continuing to produce gas, such as tax revenues and improving balance of payments. Environmentally speaking, a molecule of gas produced and consumed in the UK is less carbon-intensive than one shipped from another continent. However, lowering energy bills substantially is not a good reason in the British context, because without real reduction in consumption, it is highly unlikely that Britain would ever be able to produce enough to affect the price of gas more than marginally.

Gas production from the oil-weighted North Sea is very likely to be in terminal decline due to geology and policy volatility. There are 1.9 billion barrels of oil equivalent (BOE) in contingent gas resources in the North Sea – amounting to 11 years of current production levels – which does not meet domestic demand.[32] Only 1.1 billion BOE are currently considered economical to extract. Investment and exploration has been discouraged by a volatile tax regime and the ban on new exploration licences. Continuing to extract offshore gas resources is the obvious

[29] Kateryna Riabovol, 'German chancellor candidate Weidel promises to re-launch Nord Stream', RBC-Ukraine, 11/01/2025, https://newsukraine.rbc.ua/ (checked: 07/04/2025).
[30] Oliver Moody, 'US in secret talks with Putin's friend to revive Nord Stream 2 pipeline', *The Times*, 02/03/2025, https://www.thetimes.com/ (checked: 07/04/2025).
[31] Paul Hockenos, 'Europe Somehow Still Depends on Russia's Energy,' *Foreign Policy*, 03/01/2025, https://foreignpolicy.com/ (checked: 07/04/2025).
[32] 'UK Oil and Gas Reserves and Resources', North Sea Transition Authority, 2024, https://www.nstauthority.co.uk/ (checked: 07/04/2025).

policy choice given the UK and its continental allies still need gas, and will for decades yet. However, the fact remains that there is insufficient gas in the North Sea to reverse Britain's precarious position.

There have been reports of a recent 'discovery' of large shale gas reserves in the Gainsborough Trough in Lincolnshire, which Egdon Resources reports equates to seven years' worth of consumption and could, if exploited, offset 'significant amounts of imported gas'.[33] A 2020 study from Warwick Business School found that its upper estimate of potential national shale production would cover between 17% and 22% of British gas demand over the next quarter of a century, although it assumed a decline in gas demand to meet Net Zero by 2050.[34]

If shale production is economically viable on a large scale (which is unknown due to restrictive government policy), it appears unlikely that it could reverse the overall decline in gas production. A British shale revolution is not impossible, but the UK lacks the existing infrastructure, low population density in areas which would be drilled,[35] a conducive legal rights regime, and relatively plentiful water supply to replicate the American one, while the well productivity remains uncertain due to policy constraints.

Furthermore, given European gas demand (which is what really matters for determining the price), it would be 'brave' to base Britain's energy-economic policy on shale production alone. All things being equal, and British shale facing no technical or political barriers to extraction, it would require a 13% rise in UK domestic gas production to reduce European gas prices by 1%, which would equate to £5-£10 off the average British annual gas bill.[36] But North Sea production is declining at an annual rate of around 5%, so onshore shale production would need to grow at a rate to cover those losses and still increase overall gas production.[37]

More gas fields, onshore or offshore, may begin producing in the future, but it would not be sensible to bet the security of the British economy on a UK shale revolution or a reversal in the North Sea's fortunes. Even if such a reversal occurred, it would be better to manage those resources in a similar fashion to Norway: decisions on production would be better made through the prism of their ability to

[33] 'Giant gas field discovered in Lincolnshire "could fuel UK for years"', ITV News, 14/02/2025, https://www.itv.com/ (checked: 07/04/2025).
[34] Nicholas Solman and Michael Bradshaw, 'Briefing: Shale Gas and UK Energy Security', Warwick Business School, 03/2020, http://www.ukuh.org/ (checked: 07/04/2025).
[35] This is a critical factor. See: Jamie Horgan, 'Population Density Is America's Shale Success Secret', *The American Interest*, 08/12/16, https://www.the-american-interest.com/ (checked: 07/04/2025).
[36] This assumes the following criteria are met: a European gas demand of 450 BCM (an 11 year low in 2024), see: 'Gas consumption trends and LNG outlook', Institute for Energy Economics and Financial Analysis, 02/2025, https://ieefa.org/ (checked: 07/04/2025); a UK gas production of 34 BCM, see: 'OEUK Economic Report 2023: UK must supercharge homegrown offshore energy to deliver net zero and growth', Offshore Energies UK, 07/09/2023, https://oeuk.org.uk/ (checked: 07/04/2025); a UK average household gas consumption of 11.5MWh, see: 'Average gas and electricity usage', Office of Gas and Electricity Markets, No date, https://www.ofgem.gov.uk/ (checked: 07/04/2025); and a European gas price of €35/MWh (£29.20/MWh), see: 'Energy prices and security of supply', European Council, 04/03/2025, https://www.consilium.europa.eu/ (checked: 07/04/2025).
[37] 'Natural gas and supply consumption', Department for Energy Security and Net Zero, 27/03/2025, https://www.gov.uk/ (checked: 07/04/2025).

raise revenues in a globally competitive market rather than cutting costs for British consumers.

HM Government must electrify to diversify

The key question policy makers must ask themselves is this: is it worth being exposed to prices on the bet that those prices might often be low, thereby making British energy competitively priced even if largely dependent on imported energy? In a more peaceful world, this might make sense were the UK economy consistently growing.

But that is not the world Britain resides in now. Even its closest trading partner has proven it is willing to use trade as a weapon against its allies. The supply lines for a significant portion of the UK's gas supply now span oceans, and often go through strategic chokepoints within range of attack from Britain's enemies (such as the Houthis). Rising economies situated much closer to the supply sources will be buying more and more gas over the coming years. And the UK has no control over Europe's policy towards trading gas with Russia: if it resumes, Britain will once again be vulnerable to Russian energy warfare.

Therefore, it would be wiser to pursue competitive but stable prices. This can now only be done through a reduction in the domestic consumption of gas. This is not the same as a reduction in domestic production, which would necessitate even larger reductions in consumption. Rather, the transition away from gas for heating (particularly domestic but also eventually commercial and industrial heat) and further transition in electricity generation is necessary.

Electrification – switching gas appliances for electric appliances – enables the diversification of the UK's heat supply. An electric storage heater or heat pump would still be powered by gas at the moment, but also renewables, nuclear power and other sources. This means that gas would be consumed more sparingly than it is now with the continued buildout of renewable and nuclear capacity. With this in mind, the prospective Gainsborough Trough field might provide Britain with, say, ten or more years of gas consumption rather than its current projection of seven years.

The transition in both electricity supply and heating must, of course, be cost-efficient. A wasteful or expensive transition in generation is certainly an ongoing risk and would jeopardise the electrification of heat (and indeed transport) by driving up the running cost of appliances to levels too high for consumers. Also, the transition in heating must be consumer-led rather than imposed to be politically acceptable.

Conclusion

The electrification of the UK will require widespread reform, trade-offs, and investment, which has not yet been forthcoming (largely for political reasons). A Primer will follow this Explainer later in the year, which will provide recommendations for HM Government to diversify Britain's energy mix faster and in a cost-effective way.

ABOUT THE AUTHOR

Jack Richardson is the Head of Policy at Octopus Energy. He was previously the Policy Adviser to Claire Coutinho, Secretary of State for Energy Security and Net Zero, where he advised on a range of subjects covering energy infrastructure and Net Zero. Before that, he led think tank Onward's Energy and Environment programme and the Conservative Environment Network's climate and energy campaigns.

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Address: 14 Old Queen Street, Westminster, London, SW1H 9HP
Phone: 020 3915 5625
Email: info@geostrategy.org.uk