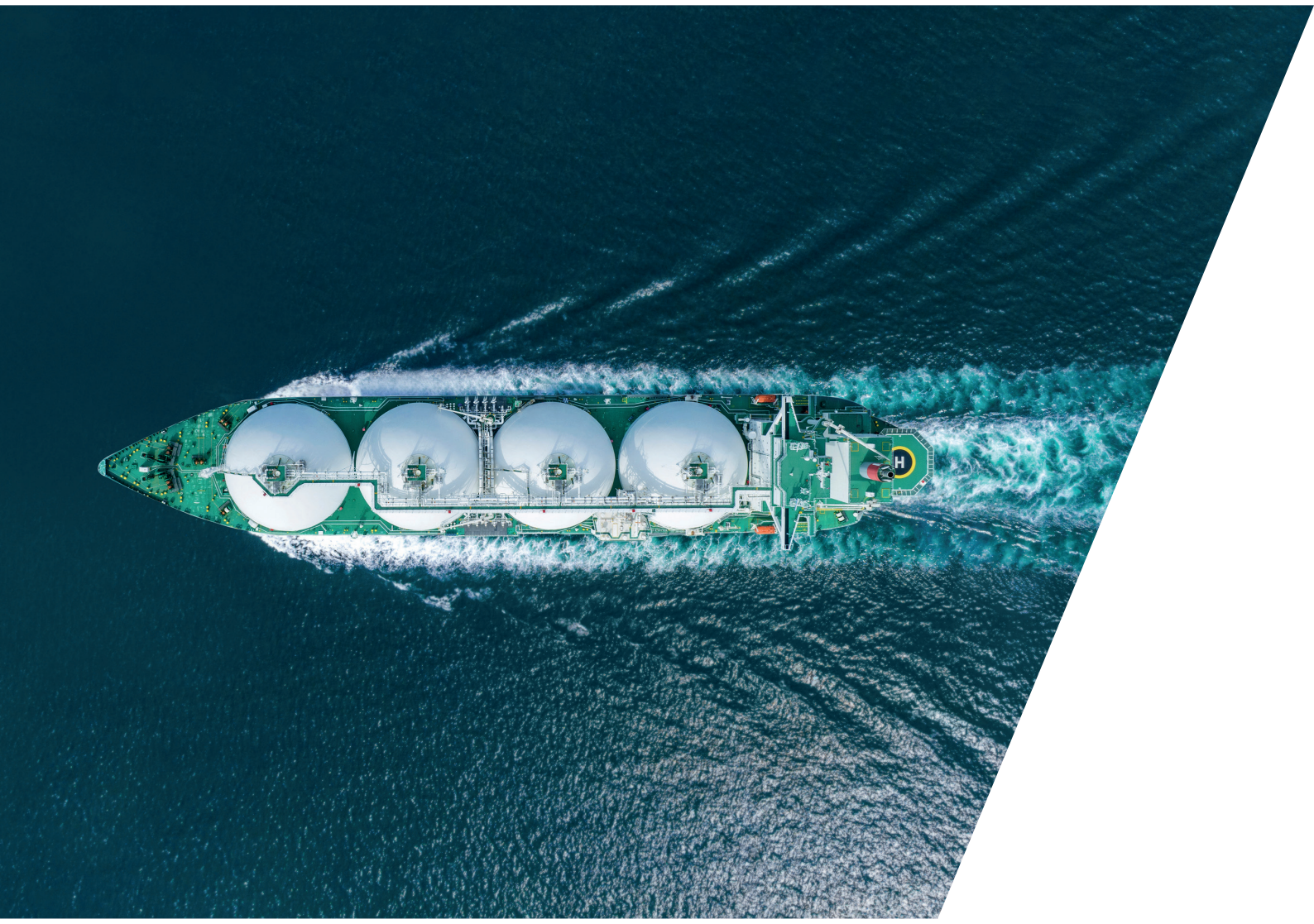
NATURAL GAS AND THE ENERGY TRILEMMA

Energy Security, Energy Affordability, and Energy Sustainability in the United Kingdom?

BY DR HELENA IVANOV



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Contents

Executive Summary

In this report we examine the role of natural gas in the Energy Trilemma, focusing specifically on the situation in the United Kingdom. Following Russia's invasion of Ukraine, many countries found themselves in an energy crisis, partly due to their overreliance on Russian gas. The UK, while not directly dependent on Russia for gas, was nevertheless hit quite badly, due to certain structural reasons within its energy supply system.

Thus, we examined the UK energy system, focusing specifically on its implications for the Energy Trilemma – understood as comprising Energy Affordability, Energy Sustainability and Energy Security. We have shown ways in which the UK could improve its system, especially when it comes to affordability and security.

To create effective policy recommendations, we have also conducted public opinion polling with a representative sample of voters across the UK. In the polling, we examined people's views on gas, how informed they are about the current energy system in the UK, and how the nation balances the three key priorities encompassed in the Energy Trilemma. Along with renewable energy sources, British voters strongly support the use of gas, as well as an expanded role for diversifying gas supply within the nation's energy mix. In the end, we arrived at the following policy recommendations:

- The UK should aim to *diversify* its gas supply, given its current overreliance on Norway and, to a lesser degree, autocratic countries like Qatar.
- Priority should be given to the UK improving its energy *self-sufficiency* through developing its own domestic gas resources and diversifying its supply towards friendly and democratic LNG exporters such as the United States and Australia.
- Given the important role of gas in supporting Britain's energy transition, more *sustainable sources of new gas supply*, such as those with a lower CO2 content or zero emissions properties, are preferable.
- The UK should address its *shortage of gas storage infrastructure and liquified national gas (LNG) import capacity* which currently leave it vulnerable to supply shocks, such as those seen during the 2022 Russian invasion of Ukraine.

In addition, in challenging and difficult times like the ones in which we live now, the UK Government should also focus on more *efficient use of energy* and start to deploy *information campaigns* which could inform the public about the current energy system and ways to more efficiently use energy.

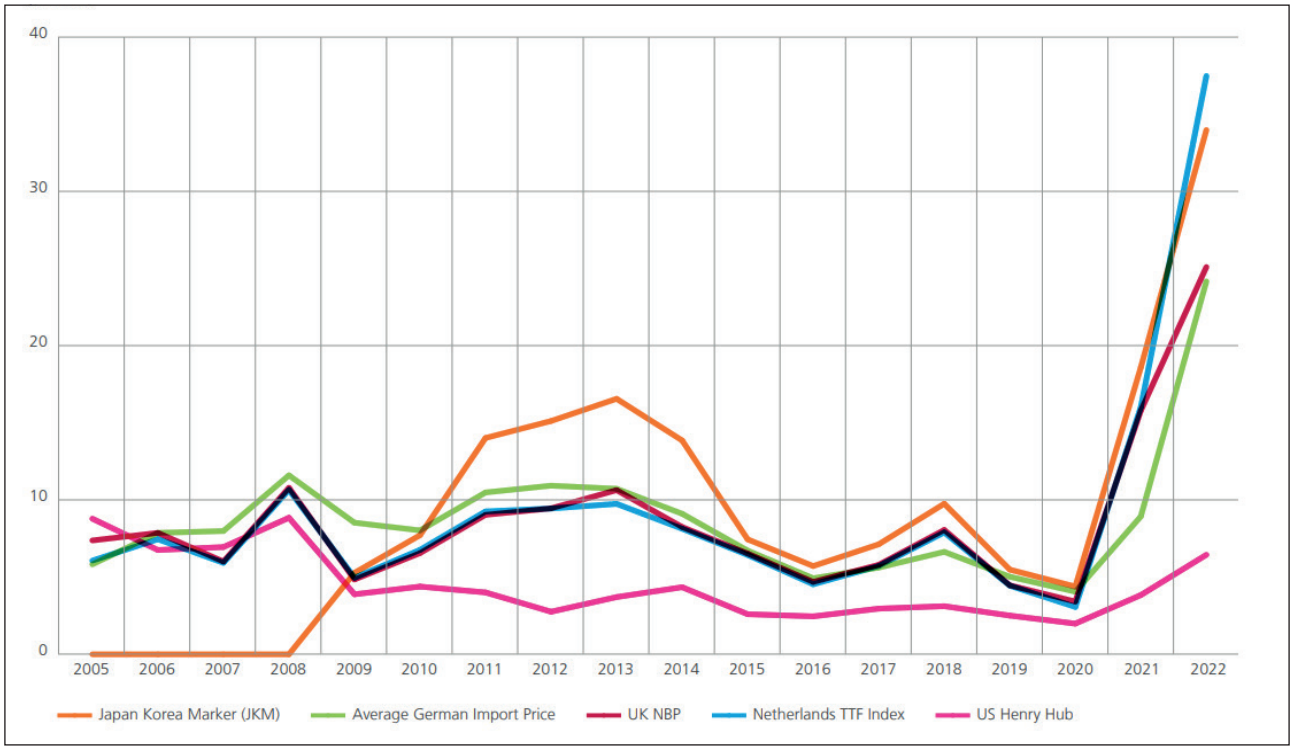
Introduction

Russia's invasion of Ukraine has led to an unprecedented global crisis, with an impact that continues to ripple across international markets and fuel geostrategic uncertainty. Among other things, Russia has made a concerted attempt to weaponise energy resources and force Europe into a corner due to its reliance on Russia's energy imports. Despite this, the Western world has remained resilient, imposing never-before-seen sanctions against Russia, and either limiting or halting the import of Russia's gas, oil and coal. However, in the absence of a concerted decoupling effort in the years prior, an inevitable consequence of these sanctions has been the energy crisis European nations now grapple with, one which has cascaded across the rest of the world.

Despite not being as dependent on Russian energy as some of its European counterparts, the UK has nevertheless been heavily impacted by the regional supply shock. "According to the Office for National Statistics' Cost of Living Insights dated 27th February 2023, electricity prices in the UK rose by 66.7% and gas prices by 129.4% in the 12 months to January 2023." [1] As a consequence, "around half (47%) of adults [in Great Britain] are using less fuel in their homes because of increases in the cost of living." [2] Being a vital input across the economy, these price increases have further exacerbated inflationary pressures in goods and services, and are now considered a core driver of the cost-of-living crisis.

In particular, states that have relied most heavily on Russian gas have found their economies in a challenging situation, faced with the realisation that the bill had come due for the trade-offs

Figure 1: Prices $/mmBTU [3]



[1] "The energy price cap has fallen, but bills will still rise. What's going on?" Northern Energy, 9 March 2023, https://www.northernenergy.co.uk/news/the-energy-price-cap-has-fallen-but-bills-will-still-rise-whats-going-on/.

[2] "Cost of living insights: Energy", ONS, 6 October 2023, https://www.ons.gov.uk/economy/inflationandpriceindices/articles/costoflivinginsights/energy.

[3] "2023 Statistical Review of World Energy", Energy Institute, https://www.energyinst.org/statistical-review, p.34.

they had been making around energy security. The actions of Vladimir Putin's Russia towards the import-dependent European states even before the Ukraine War exposed the Western world's worst fears about their own economic vulnerabilities. Conversely, Western countries that have significantly developed their own domestic gas resources, such as the United States and Australia, have been able to more effectively manage the price rises and the impact on their consumers and local industries.

States like Germany, that have depended heavily on Russia, have been forced to realise that relying on potentially hostile states for energy (even when it means paying a smaller price) comes at a greater cost for their own national security and stability. This realisation, in turn, has forced these states to rapidly re-think their energy supply system, while grappling with the dependencies and needs locked in by existing systems and infrastructure. The dilemma faced by these states is exacerbated by a lack of long-term strategic planning and the years of capital investment required to pivot an entire nation's energy markets. Conversely, non-European Western countries, such as the United States and Australia, have significantly developed their own domestic gas resources, and have been able to more effectively manage price rises and the impact on consumers as a result.

Interestingly, although not as directly reliant on Russia as other European states, the crisis has exposed that the UK's own energy system has its own structural flaws that rendered the country dangerously exposed to events on the continent, and the subsequent volatility it created. The global nature of the gas trade meant that the rapid withdrawal of the Russian gas supply to Western economies from mid-2022 massively shocked prices for those without a reliable domestic source or alternative long-term supply contracts to fall back upon.

Firstly, despite gas being the number one energy source in the UK, there are very limited storage capabilities or strategic reserve capacity. While most European countries have the capacity to store gas for months at a time, particularly around winter, the UK "can only hold enough gas to meet a few days of demand." [4]

Secondly, the UK is extremely reliant on imports. Although it has created a "set-up that means the country will almost always be able to source enough gas for its needs" it comes with the strategic risk that "during uncertain times it will have to pay a high price." [5]

Moreover, a closer look at where the UK sources its gas reveals that this set-up is not very diverse and is incredibly reliant on Norway. As the UK's primary energy partner, Norway was responsible for a staggering 77% of gas imports to the UK, and 49.9% of its crude oil imports in 2021. [6] While a friendly country, and generally aligned with the UK's interests, this dependency represents a glaring vulnerability and obvious target should a hostile actor want to disrupt the UK's energy supply.

Lastly, further entrenching this reliance, the UK has some of the least energy-efficient households in Europe. [7] This creates an environment in which both the state and ordinary households are incredibly vulnerable to concerns around energy security and fluctuations in supply, which directly translates into affordability pressures on British households.

Compounding this pressure further, recent years have seen the growth in conversations regarding the impact of current energy policy setting on changes to the climate – with

4 Madeleine Cuff, "Energy bills rise: Getting rid of gas storage facilities has left the UK exposed to shortages and price hikes", *iNews*, 3 February 2022, https://inews.co.uk/news/uk-gas-storage-facilities-shortages-energy-price-rises-rough-1441830.

5 Ibid.

6 "Trends in UK imports and exports of fuels", ONS, 29 June 2022, https://www.ons.gov.uk/economy/nationalaccounts/balanceofpayments/articles/trendsinukimportsandexportsoffuels/2022-06-29#recent-trends-in-uk-imports-and-exports-of-fuels.

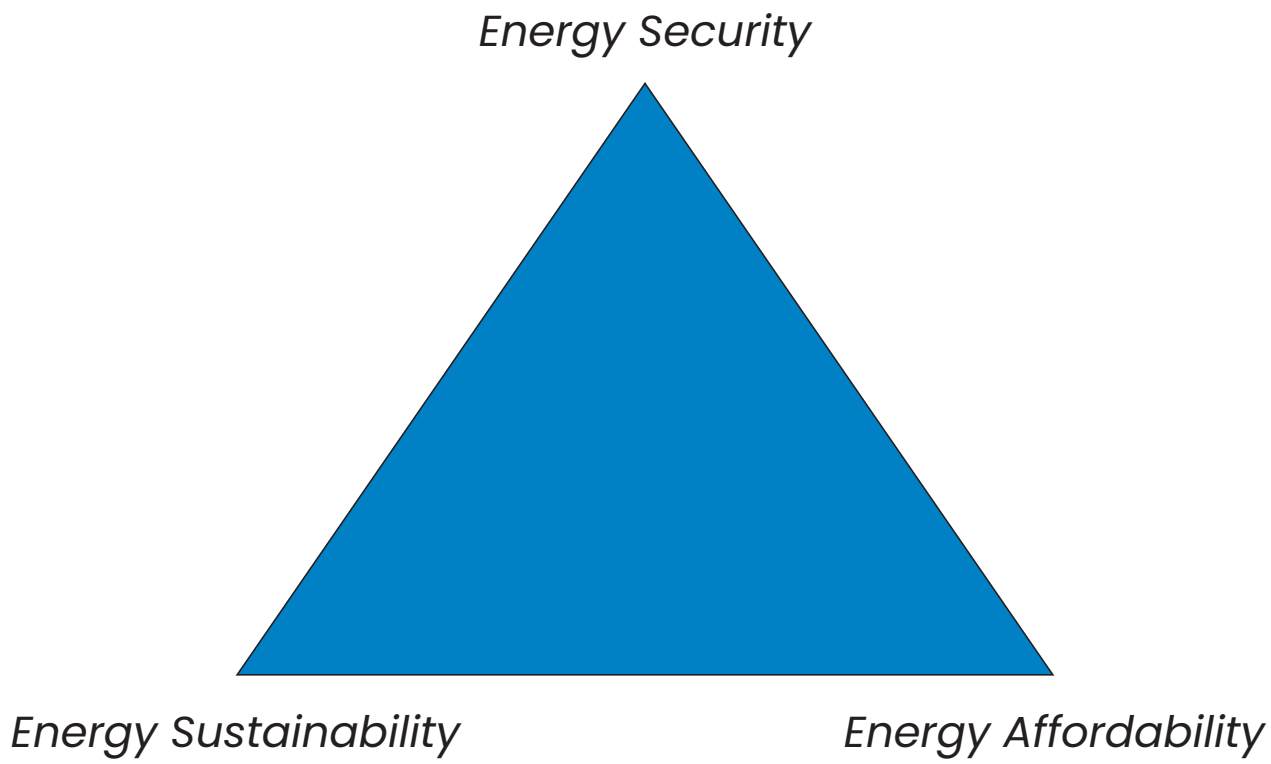
7 Damian Carrington, "Energy crisis: UK households worst hit in western Europe, finds IMF", *The Guardian*, 1 September 2022, https://www.theguardian.com/money/2022/sep/01/energy-crisis-uk-households-worst-hit-in-western-europe-finds-imf.

increasing concern among voters and legislators that the UK must do its fair share to achieve more sustainable levels of emissions. It's crucial to bear this in mind, as while Russia's invasion of Ukraine provided European nations with an impetus, and the political will, to address energy security and affordability risks, climate change is a reality that will only become increasingly pressing as time goes on. And the rising public support for combatting climate change has also placed pressure on legislators to act.

The Energy Trilemma

To develop a deeper understanding of the current and future role of gas in the UK's energy mix we draw upon the internationally recognised policy paradigm referred to as the Energy Trilemma. The Energy Trilemma illustrates the strategic trade-offs inherent in the three most pronounced objectives of any energy system. "The trilemma comprises:

- Sustainability: decarbonising energy
- Security: ensuring the security and reliability of energy supplies
- Affordability: minimising the cost of energy to consumers." [8]



Effectively addressing every element of this trilemma is often difficult to achieve.

Improving security and sustainability tends to add to the cost. Secure and cost-effective energy supply is not always sustainable. And as we have seen during the recent energy crises in Europe, affordable and more sustainable energy supply can sometimes lead to a less secure energy system.

And, generally speaking, the processes of transitioning existing infrastructure to environmentally sustainable energy systems becomes both very expensive and socially disruptive.

[8] Becky Mawhood and Nikki Sutherland, "Tackling the energy trilemma", House of Commons Library, 22 March 2023, https://commonslibrary.parliament.uk/research-briefings/cdp-2023-0074/.

In Europe, relying on security-aligned partners for energy supply was considered to be more costly than relying on (potentially) risky states – which partly explains why so many European states chose to rely so heavily on Russia for their energy supply.

Achieving a balance for all three components of the trilemma can often mean strong but sub-optimal outcomes within each individual component. The UK appears to strike a reasonable balance, with *fairly* strong performances on two of the three individual components of the trilemma.

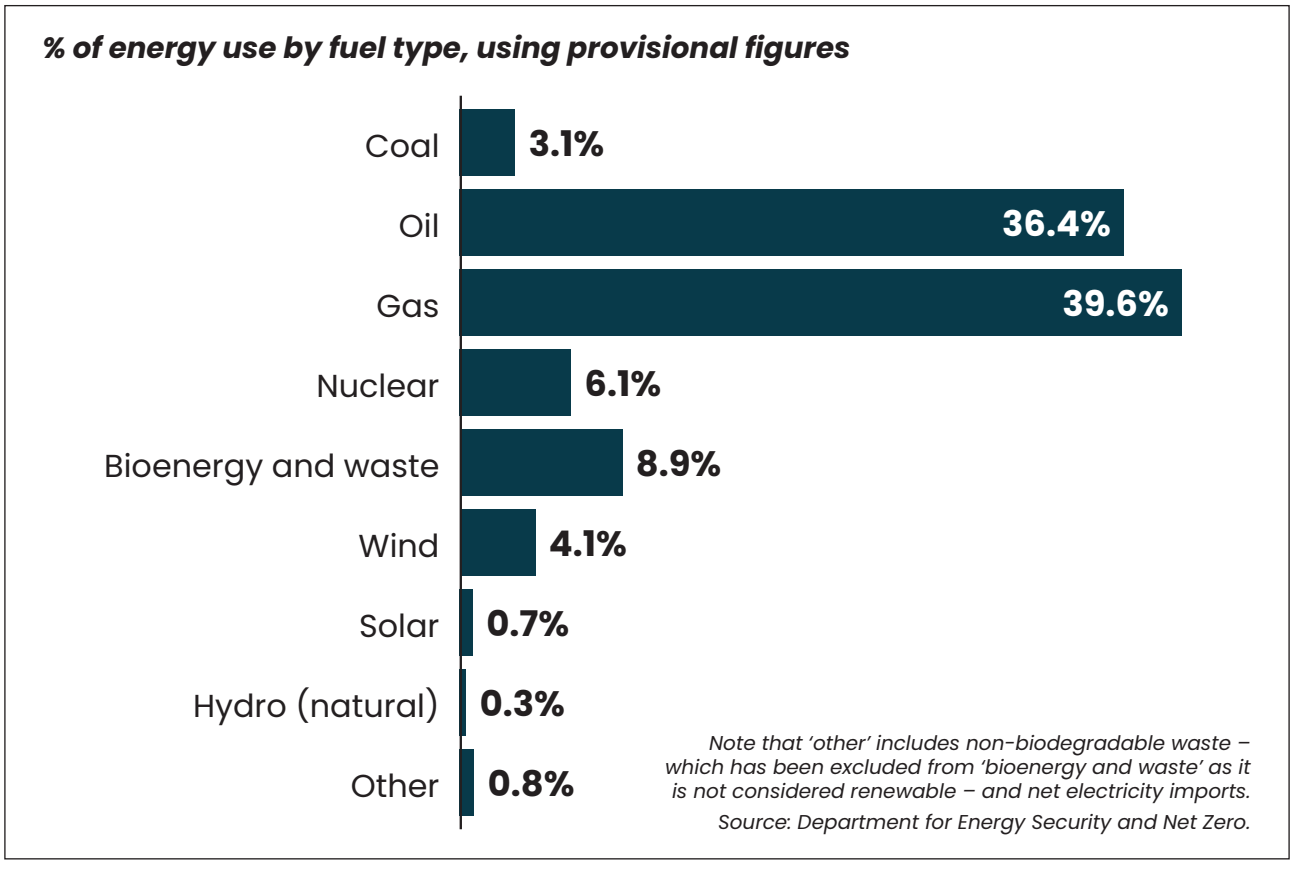
Current UK Energy System

According to the World Energy Council's 2022 World Energy Trilemma Index (published prior to the war in Ukraine), which ranks the energy systems of 127 countries, the UK ranks fourth overall, scoring a full AAAa grade (1st A representing Security, 2nd A representing Equity/Affordability, and 3rd A representing Sustainability, with small a representing country context).[9] Overall, the UK's average score is 82.4 out of 100 points on the Trilemma Index.[10] As for the individual objectives, UK ranks 10th in Security, it is not in the top 10 when it comes to Equity/Affordability, and it ranks 7th in Sustainability.[11]

As for energy sources used in the UK:

> In 2022, the majority of the primary energy consumed within the UK (78.4%) came from coal, oil and gas, known as fossil fuels. That is down from 87.2% in 2012, mainly due to the declining use of the dirtiest fossil fuel, coal... Around one-fifth (20.7%) of UK primary energy consumption was from 'low-carbon' sources in 2022 – up from 12% in 2012. 'Low-carbon' includes renewables such as wind, solar, hydropower and bioenergy, as well as nuclear.[12]

Figure 2: Energy use within the UK in 2022[13]



9 "World Energy Trilemma Index", World Energy Council, 2022, https://www.worldenergy.org/assets/downloads/World_Energy_Trilemma_Index_2022.pdf?v=1669839605.

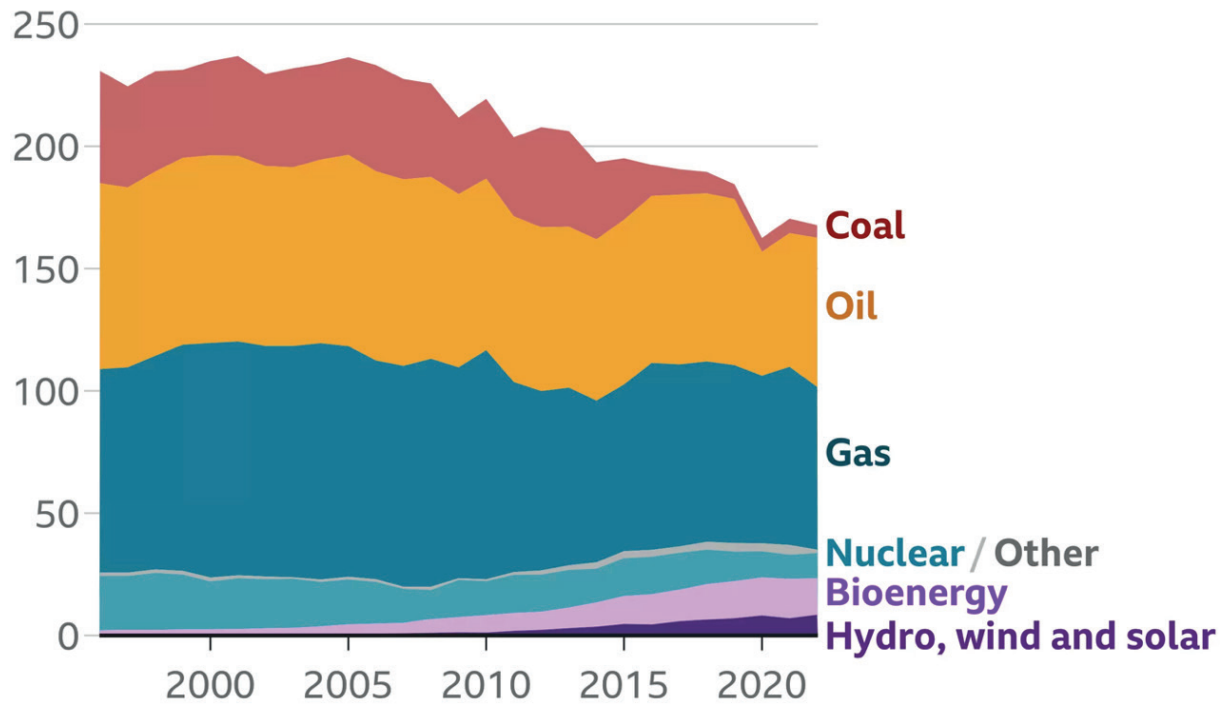
10 Ibid.

11 Ibid.

12 Mark Poynting, "Fossil fuels, renewables and nuclear: The UK's changing energy mix", *BBC News*, 3 October 2023, https://www.bbc.com/news/business-63976805.

13 Ibid.

Figure 3: How energy use has changed within the UK [14]



Note: Figures for 2022 are provisional *Source: Department for Energy Security and Net Zero.*

Overall, we can conclude that the UK is faring comparatively well on the Energy Trilemma Index; however, the invasion revealed how precarious things are in practice and that there is still room for improvement across all areas, but especially when it comes to energy affordability.

In March 2023, UK Prime Minister Rishi Sunak released *Powering Up Britain: Energy Security Plan* which targets a reliable, resilient and affordable supply of gas.

In recognition of the inherent trade-offs of the Energy Trilemma, the Prime Minister has also spoken about the need to re-balance the nation's approach:

> If we continue down this [current decarbonisation] path, we risk losing the consent of the British people and the resulting backlash will not just be against specific policies, but against the wider [climate change] mission itself. [15]

Energy Affordability

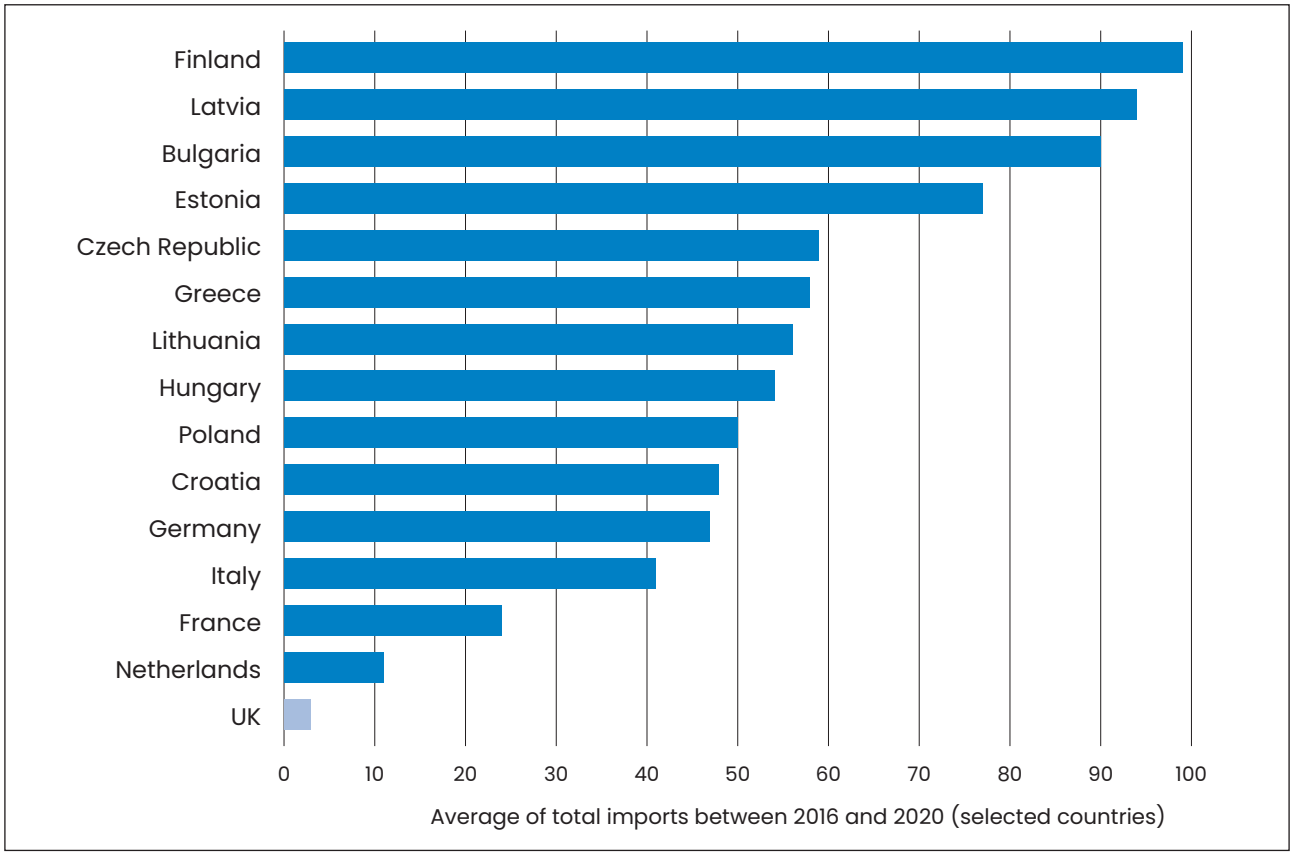
Russia's invasion of Ukraine and the subsequent weaponisation of energy sources by the Russian regime sent shockwaves across Europe, a region known for its high-dependency on Russia for oil and gas. As shown in the figure below, the UK was far less reliant than most of its European counterparts on Russia energy sources. According to the data, in March 2022, the UK imported only about 4% of Russian gas. [16]

[14] Mark Poynting, "Fossil fuels, renewables and nuclear: The UK's changing energy mix", *BBC News*, 3 October 2023, https://www.bbc.com/news/business-63976805.

[15] Helena Horton, "UK net zero policies: what has Sunak scrapped and what do changes mean?", *The Guardian*, 20 September 2023, https://www.theguardian.com/politics/2023/sep/20/uk-net-zero-policies-scrapped-what-do-changes-mean.

[16] "The Russia-Ukraine Crisis: Implications For Energy Markets", Slaughter and May, 14 March 2022, https://my.slaughterandmay.com/insights/briefings/the-russia-ukraine-crisis-implications-for-energy-markets.

Figure 4: Gas supplies from Russia to Europe (average of total gas imports, 2016-2020) [17]



Thus, as Russia invaded Ukraine and the West adopted sanctions (including restricting Russian energy resources), one could have assumed that the comparative lack of dependency on Russia would make the UK less exposed to price volatility. However, when it comes to energy affordability, the UK was hit particularly bad. According to an International Monetary Fund (IMF) report published in 2022, "UK household budgets [were hit] harder than any country in western Europe." [18]

There are several reasons why the UK was particularly exposed to the price volatility of gas. First, the demand for gas in the UK is especially high in comparison to many European countries. [19] To meet such high demand, the UK relies on "a mix of domestic gas sourced from the North Sea, pipeline imports from Europe [with Norway being the largest supplier according to the data above], and liquified natural gas (LNG) shipments from the likes of Qatar." [20] Second, the UK has extremely limited storage capacity [21] which has contributed to the gas price as it prevents the country from saving and storing gas during the summer when prices are lower. More specifically:

> Germany and the Netherlands are among the EU countries to store enough gas to help them meet months of winter demand. By comparison, the UK can only hold enough gas to meet a few days of demand. [22]

[17] David Lawrence, "UK trade and the war in Ukraine", Chatham House, September 2022, https://www.chathamhouse.org/sites/default/files/2022-09/2022-09-01-uk-trade-war-in-ukraine-lawrence_0.pdf.

[18] Carrington, "Energy crisis: UK households worst hit in western Europe".

[19] Dr Anna Valero, "Why have energy bills in the UK been rising?", LSE, 20 October 2022, https://blogs.lse.ac.uk/politicsandpolicy/why-have-energy-bills-in-the-uk-been-rising-net-zero/.

[20] Cuff, "Energy bills rise: Getting rid of gas storage facilities has left the UK exposed to shortages and price hikes".

[21] For further details see: https://agsi.gie.eu. It should be noted that EU states are able to rely on other EU states for gas supply in instances where their storage capabilities are limited, while that option is no longer available to the UK.

[22] Cuff, "Energy bills rise: Getting rid of gas storage facilities has left the UK exposed to shortages and price hikes".

Thus, while the UK is not directly reliant on Russia for its energy resources, it is heavily reliant on imports in general – an increase in the global price was always going to have a negative impact on UK households. Consequently, when it comes to energy affordability, Russia's invasion of Ukraine has revealed the structural weaknesses of the UK system.

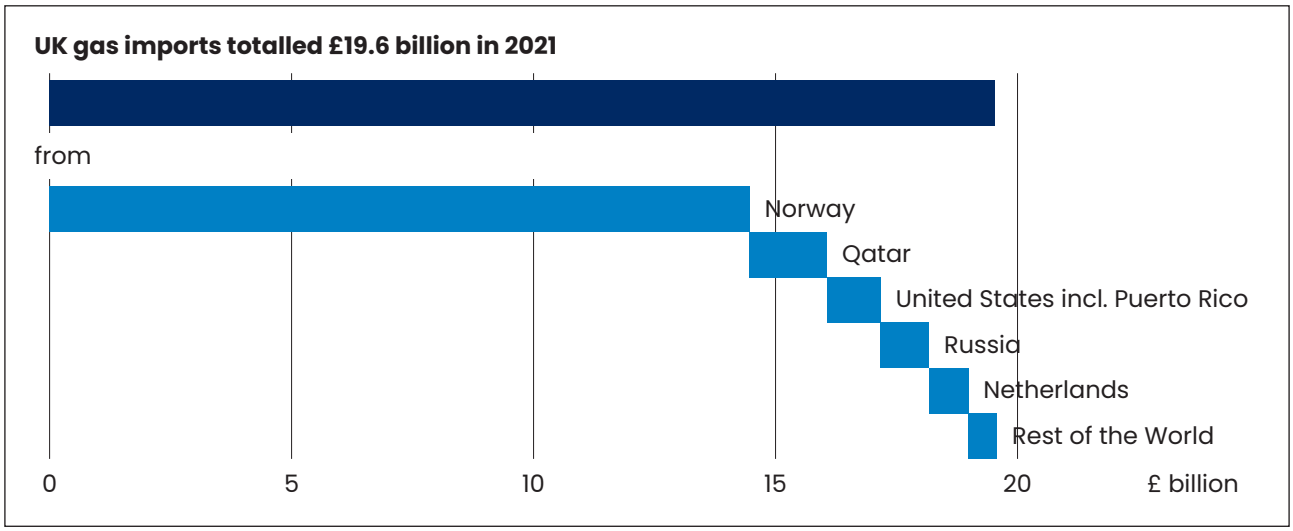
Energy Security

Russia's weaponisation of energy resources in response to sanctions has raised thorny questions about energy security. In the span of just a few months, the world faced the devastating consequences of depending on hostile states for energy resources and many countries started re-thinking their energy supply policies so as to ensure that their partners were secure and reliable.

When it comes to gas, "the UK's gas imports are primarily natural gas, in either a liquefied or gaseous state" [23] with the top five import partners in 2021 being Norway, Qatar, the USA, Russia and the Netherlands (see chart below). [24] "Natural gas in gaseous state is imported via pipeline, primarily from Norway [...] [and] the United States has been the largest source of LNG, followed by Qatar, Peru, Angola and Russia." [25] At a glance, the UK's energy partners would generally be considered secure and stable, with the potential exception of Qatar, given their autocratic governments and concerning human rights records. [26]

Furthermore, following Russia's invasion of Ukraine, the UK Government has pledged to phase out any reliance on Russia's gas. By the time the research for this report began, the UK Government had fulfilled its pledge and "banned imports of oil, petroleum products, gas and coal from Russia. In January [2023] the UK imported none of these fossil fuels from Russia." [27]

Figure 5: Top five import and export partners, natural gas, 2021 [28]



Yet despite this seeming security, the UK remains heavily exposed to events on the continent. Nowhere is this more apparent than in the UK's enormous reliance on Norway for the lion's

[23] "Trends in UK imports and exports of fuels", ONS.

[24] Ibid.

[25] Ibid.

[26] "2022 Country Reports on Human Rights Practices: Qatar", U.S. Department of State, https://www.state.gov/reports/2022-country-reports-on-human-rights-practices/qatar/.

[27] Paul Bolton, "Imports of fossil fuels from Russia", House of Commons Library, 13 March 2023, https://commonslibrary.parliament.uk/research-briefings/cbp-9523/.

[28] "Trends in UK imports and exports of fuels", ONS.

share of its imports. This underscores a significant energy vulnerability, which if targeted by a hostile actor – for example, by sabotaging the Langeled pipeline – could leave the UK in an incredibly difficult position, one compounded by its lack of gas storage facilities.

Taken as a whole, when it comes to energy security, the UK would appear to be faring better than many European countries that opted for energy partnerships with hostile states (like Russia) to decrease costs. However, it is important to bear in mind that the UK's gas supply and energy security remains incredibly vulnerable to events on the continent, with second tier suppliers from the Middle East unreliable partners at best, and at worst, aligned with Russia's ambitions to inflate energy prices to fund their own internal state-building programs. There remains a need to diversify supply towards more stable, allied democracies.

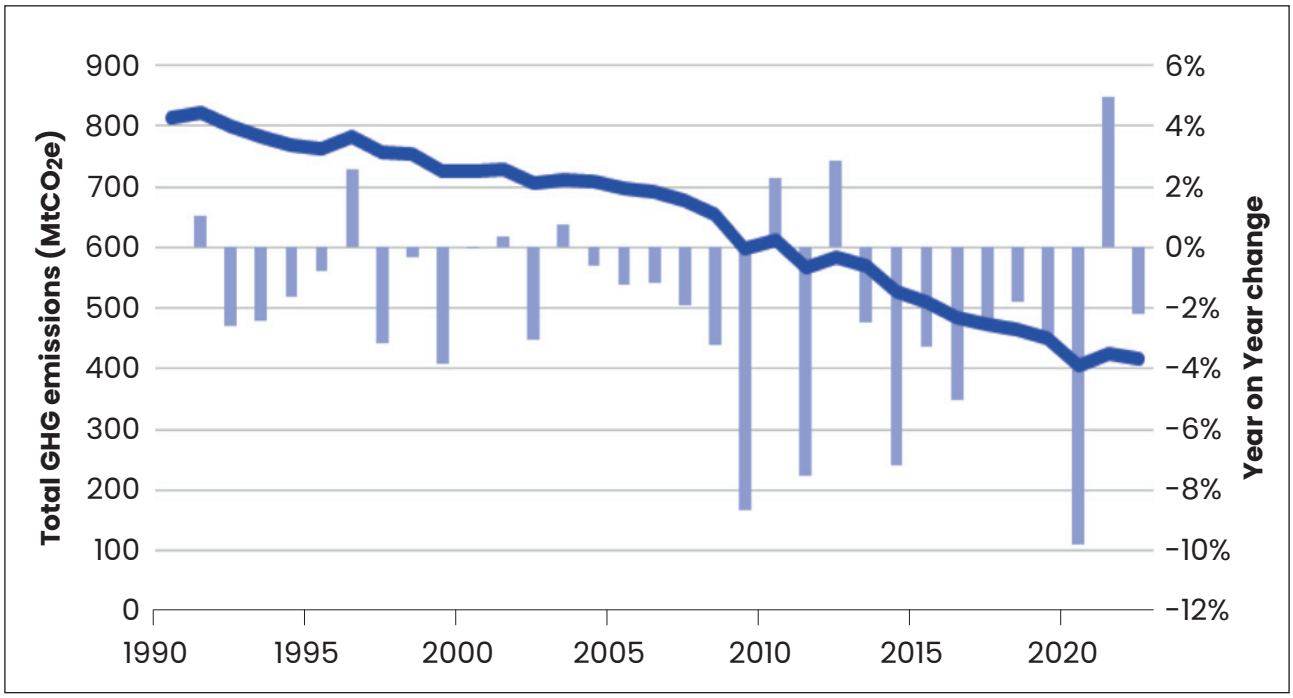
Energy Sustainability

According to a report published in March 2023 by the Department for Energy Security and Net Zero:

> Despite rises in some emissions as the UK continued to recover from the COVID-19 pandemic, 2022 saw a fall in greenhouse gas emissions in the UK, largely due to a reduction in fuel use to heat buildings. This will largely be because 2022 was considerably warmer than 2021 [...] Higher energy prices may have also caused people to reduce their energy use. [29]

Indeed, over the last few decades, the UK has significantly improved its environmental footprint. More specifically, "the UK has cut total greenhouse emissions by 41% since 1990." [30]

Figure 6: UK territorial greenhouse gas emissions 1990-2022 [31]



[29] "2022 UK greenhouse gas emissions, provisional figures", Department for Energy Security and Net Zero, 30 March 2023, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147372/2022_Provisional_emissions_statistics_report.pdf.

[30] Simon Cran-McGreehin, "UK energy and emissions", Energy and Climate Intelligence Unit, 18 October 2021, https://eciu.net/analysis/briefings/uk-energy-policies-and-prices/uk-energy-and-emissions.

[31] "2022 UK greenhouse gas emissions, provisional figures".

Nevertheless a few structural problems persist. First, energy-efficiency of UK households remains very low, especially when compared to the rest of Europe. More specifically:

> data from the latest English Household Survey shows a very small percentage of homes with the highest A or B ratings, and over 50% rated D or lower (properties vary but a D rating typically equates to a house that is not well insulated, has a dated boiler and poor double glazing). [32]

Second, UK households, and the country more generally, remain very dependent on gas. Specifically, "around 85% of households use gas boilers to heat their homes, and around 40% of electricity is generated in gas fired power stations." [33] Relatedly, the energy generated by renewables (i.e., wind, solar and nuclear) is still not enough to meet the UK's demand. Hence, gas continues to be an extremely important part of the UK's energy equation – and any move towards more sustainable policies needs to factor in the continued relevance of gas in the system, as the country begins to decarbonise. With this in mind, the role of cleaner, lower carbon gas sources is likely to be a crucial component in making progress on emissions reduction targets, while the UK undertakes a transition to more modern building stock and a broader mix of clean energy sources.

[32] Rosa Hodgkin and Tom Sasse, "Tackling the UK's energy efficiency problem", Institute for Government, September 2022, https://www.instituteforgovernment.org.uk/sites/default/files/publications/tackling-energy-efficiency-problem.pdf, p.6.

[33] Dr Anna Valero, "Why have energy bills in the UK been rising?".

Energy Trilemma Trade-Offs

Looking into the role of gas in the Energy Trilemma, the situation remains quite complex. Prioritising any of the three aspects of the Energy Trilemma would likely come at the cost of the other two aspects – which is what makes resolving the Energy Trilemma difficult in practice. The term trilemma refers to the inherent challenges of achieving all three policy objectives on a national level or even through individual energy initiatives or investments.

Prioritising energy sustainability is constrained by the real-world barriers of short-term feasibility, locked-in dependencies and, ultimately, energy affordability. This is because, in the short- to medium-term, the switch to renewables carries enormous costs, not to mention the monumental task of updating and adapting grid and transmission infrastructure in a relatively short timeframe and reconstructing inefficient building stock.

Similarly, absolute prioritisation of energy sustainability over and above other objectives is likely to fuel unaffordability and, if sustained, will have destabilising social-political consequences. In the long run, of course, switching to renewables is beneficial for energy security as it will make the UK more self-sufficient and less reliant on other states for energy resources. However, in the short- to medium-term, the UK lacks the necessary infrastructure to support renewables across the grid and must turn to imports instead. Indeed, this happened last year, as researchers "found that the UK imported more than £60bn in gas over the winter months last year [October 2022 to January 2023], despite wasting enough clean wind energy to power 1.2 million homes over the same period." [34] Thus, switching to renewables must be done in a way that ensures that the UK's demand for energy can always be met. And of course, for the foreseeable future, gas will remain fundamental in ensuring that decarbonisation does not pose serious risks to energy security or affordability.

In addition, prioritising affordability alone would possibly have negative implications for both sustainability and particularly for energy security since it could also mean being over-reliant on a single pipeline, and relying on unstable and sometimes hostile states for imports as their energy resources are often cheaper. Indeed, many countries opted for relying on Russia for gas exactly because it was cheaper. This argument works in reverse as well – prioritising energy security could imply much higher costs for British households and businesses since gas imports from stable partners could come at a higher price.

[34] Matt Mace, "Report: UK 'wasted' enough wind energy to power 1.2 million homes this winter", *edie*, 6 February 2023, https://www.edie.net/report-uk-wasted-enough-wind-energy-to-power-1-2-million-homes-this-winter/.

The British public and the Energy Trilemma

As we show in the survey results below, the British public remains very concerned about the national energy situation, with 82% saying they are concerned about the security of the UK's energy supply, and 63% supporting the idea of diversifying the number of energy supplying nations. In addition, it seems that the UK public remains uninformed when it comes to the UK energy supply system – with a majority believing that the UK is heavily reliant on Russia for its energy needs.

Third, the concerns about energy affordability and supply have an impact on the overall perception that Brits have about the situation and are likely to influence how they might vote.

Finally, while people are supportive of policies that seek to improve the sustainability of energy consumption, their willingness to see pro-sustainable policies implemented is heavily dependent on the costs – i.e., the higher the cost associated with transitioning to sustainable energy systems, the lower the level of support is.

Methodology

The survey was designed and fielded in cooperation with Freshwater Strategy. A nationally representative sample of n=1020 British voters were interviewed online between the 2nd and 9th of August 2023. Results were weighted to match the profile of the adult population living in the UK based on national statistics collected by the ONS, as well as the results of the 2019 General Election and 2016 EU referendum. The maximum margin of error for this poll at the 50% estimate is +/- 3.5% when analysing top line results.

Importance of the energy crisis

As the results below show, there is a consensus among the British people – the current energy and cost-of-living crisis is the key problem that the country is facing and resolving it must be the Government's top priority, in the eyes of voters.

Figure 7: Which of the following do you think are the most important issues facing the UK at this time

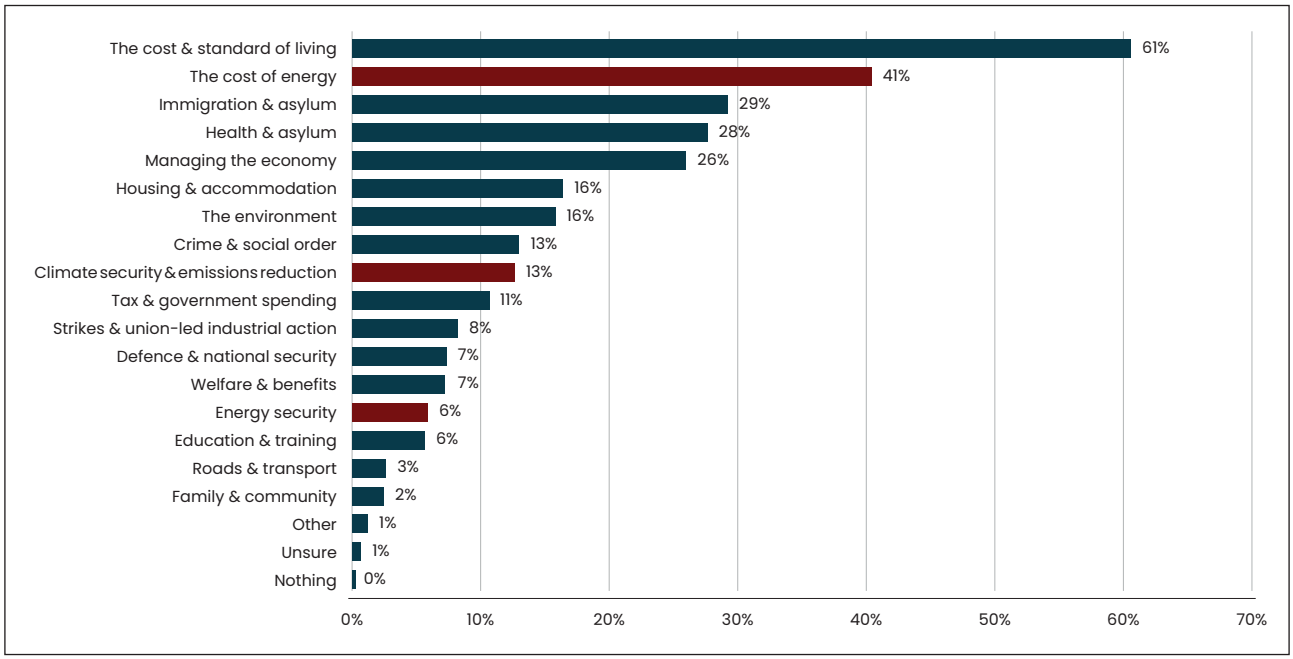


Figure 8: ...and which is the MOST important?

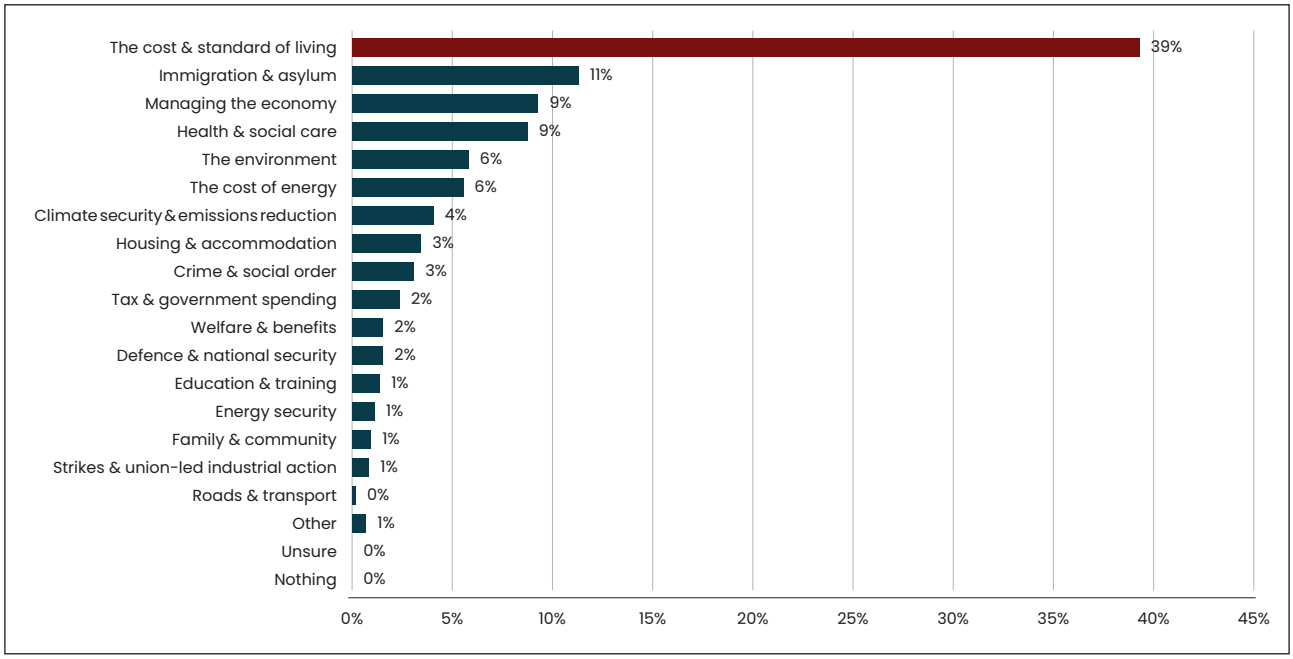
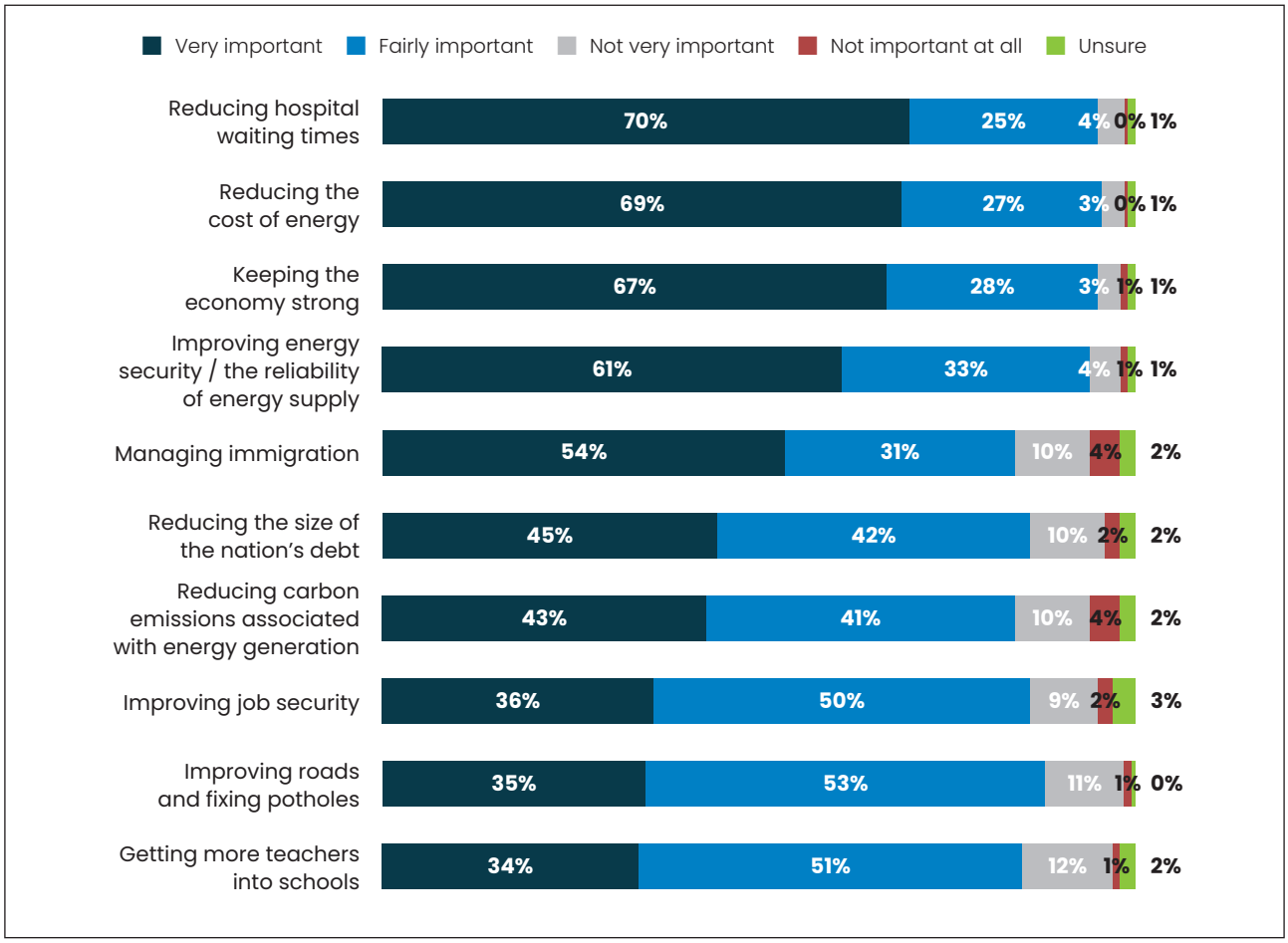


Figure 9: In your view, how important is it for the UK Government to respond to the following issues facing the UK



In particular, the events of 2022 and the European experience of the energy crisis has left a lot of British people highly concerned about energy security.

Figure 10: How concerned are you, if at all, about the vulnerability of the UK's own energy supply to sabotage (similar to the Nord Stream pipeline sabotage in September 2022) from hostile actors?

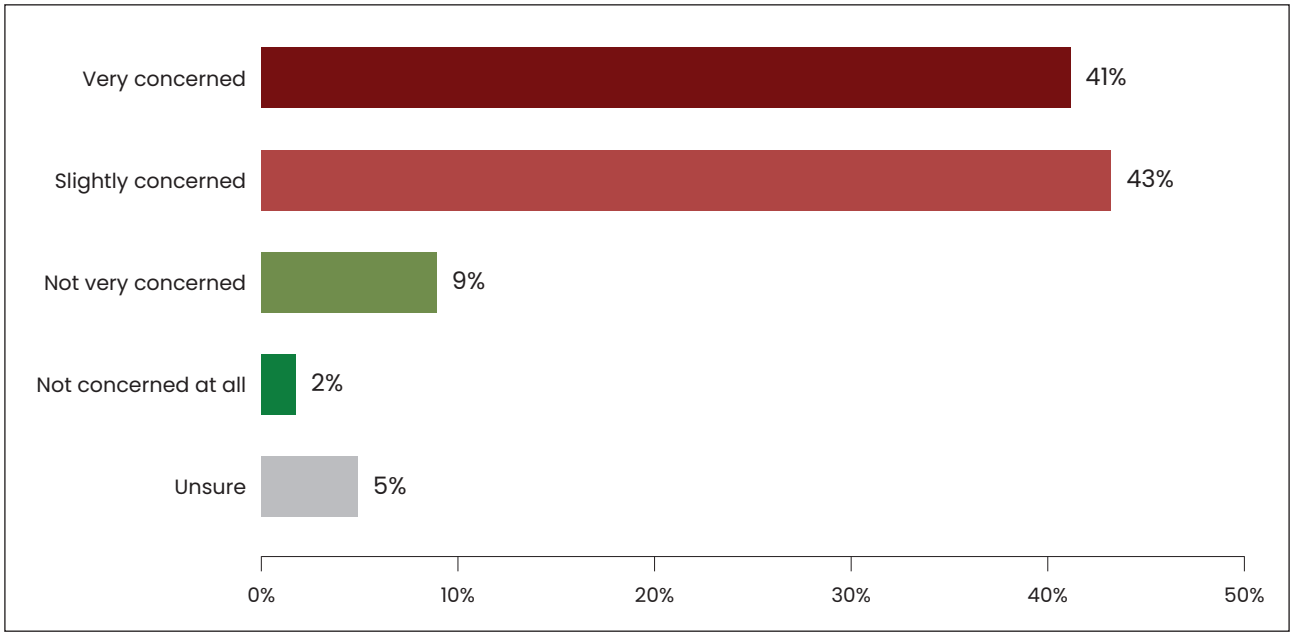
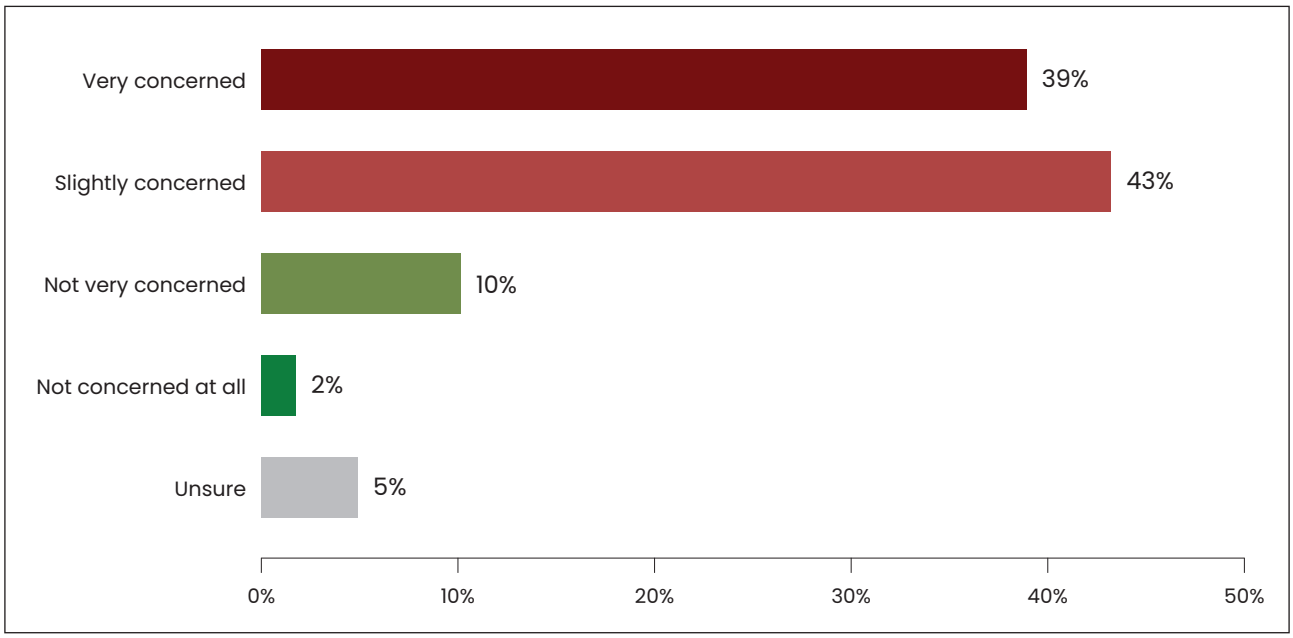


Figure 11: How concerned are you, if at all, about the security of the UK's supply?



In addition, a failure to address this crisis would likely have a significant impact on the upcoming General Election in the UK, with the public clearly stating that they would consider changing their vote if their respective parties failed to address energy supply concerns.

The impact of this crisis on voting preferences similarly impacts Conservative and Labour voters, with both groups expressing a clear intention to change their vote if security and affordability questions are not addressed. However, there is a significant difference between the two groups when it comes to energy emissions – namely, Labour voters are much more willing to change their vote if energy sustainability issues are not addressed in comparison to their Conservative counterparts.

Figure 12: If a Conservative government failed to secure a reliable energy supply, leading to black outs and shortages in your community, how likely would you be, if at all, to change your vote to another Party?

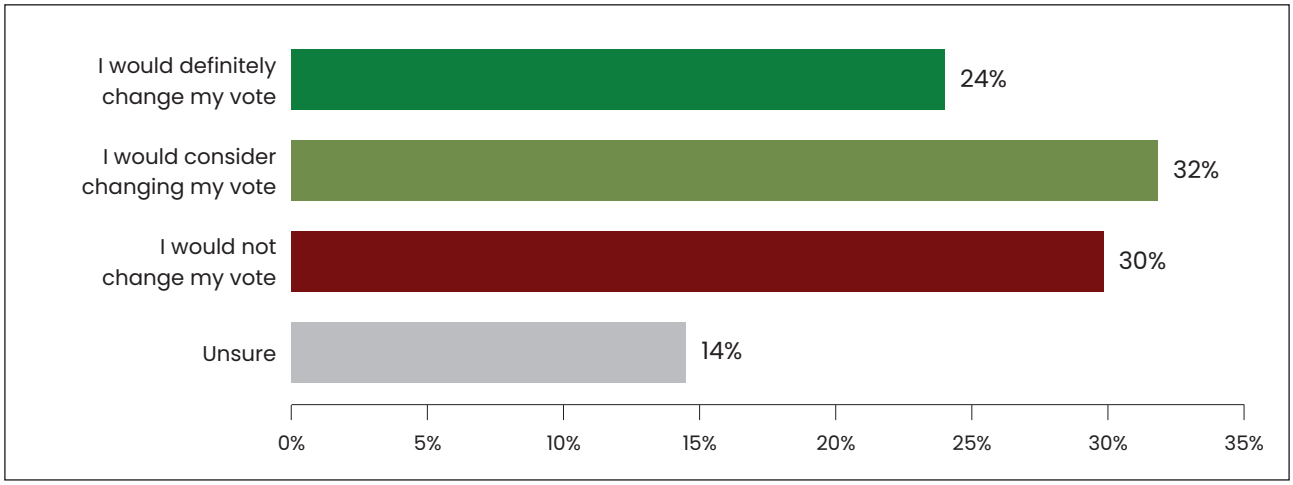


Figure 13: If a Labour government failed to secure a reliable energy supply, leading to black outs and shortages in your community, how likely would you be, if at all, to change your vote to another Party?

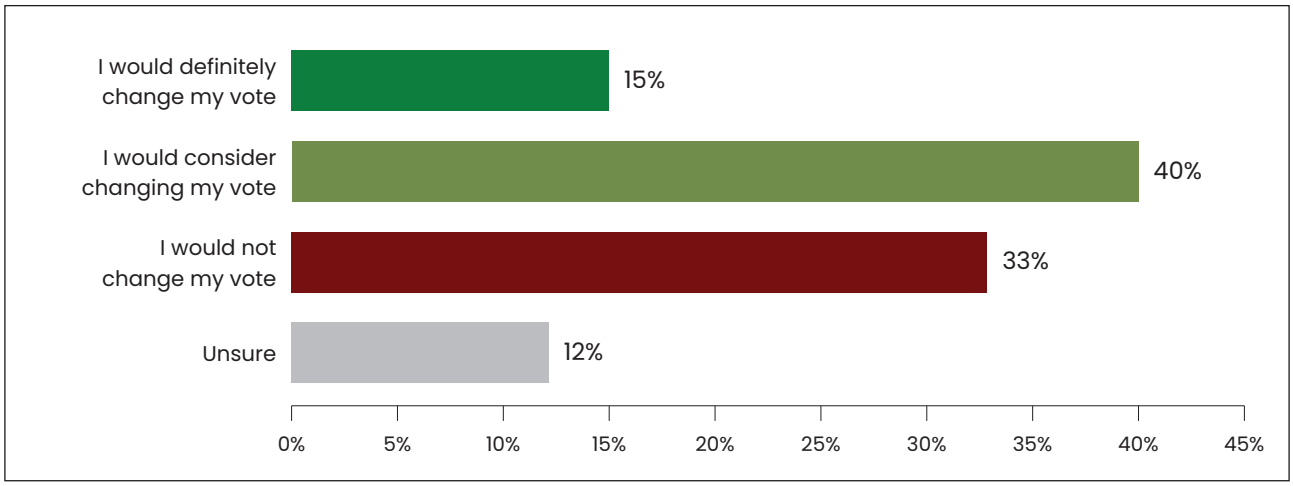


Figure 14: If a Conservative government failed to meet its emissions reduction targets, how likely would you be, if at all, to change your vote to another Party?

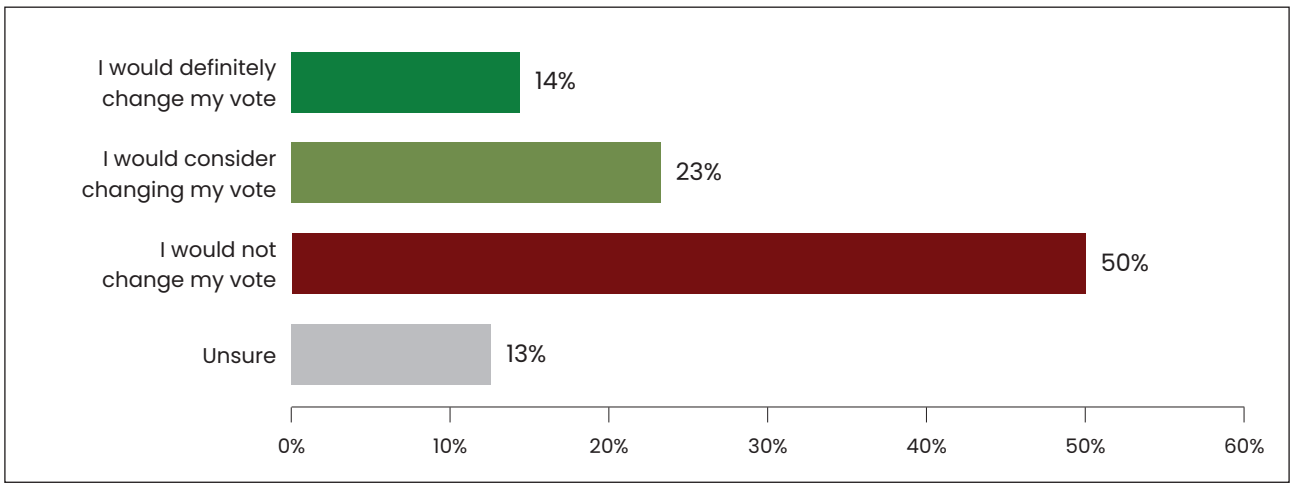


Figure 15: If a Labour government failed to meet its emissions reduction targets, how likely would you be, if at all, to change your vote to another Party?

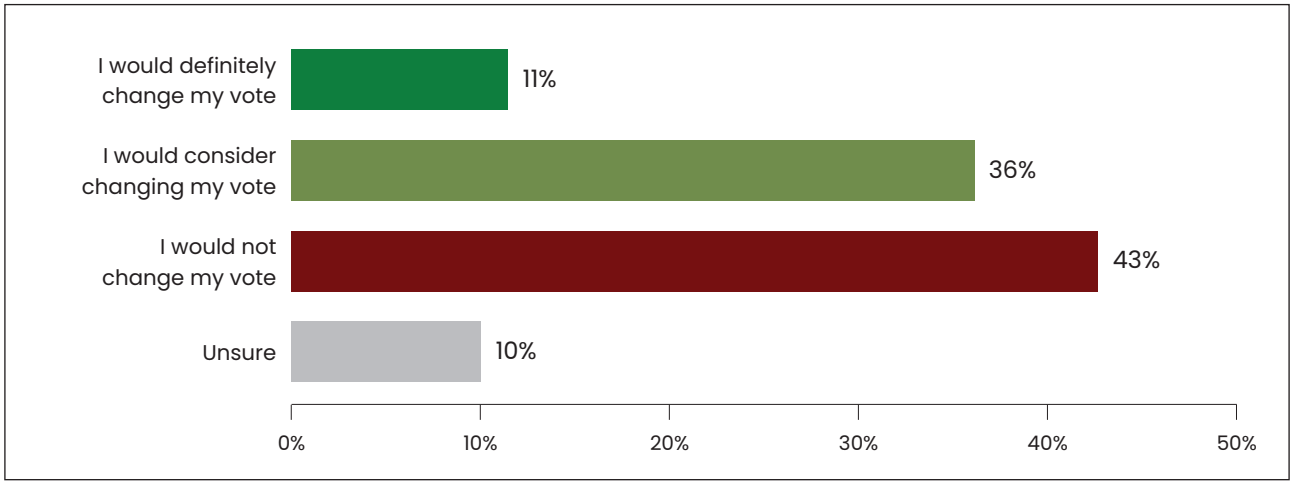


Figure 16: If a Conservative government failed to ensure affordable supplies of energy, leading to higher prices now and in the future, how likely would you be, if at all, to change your vote to another Party?

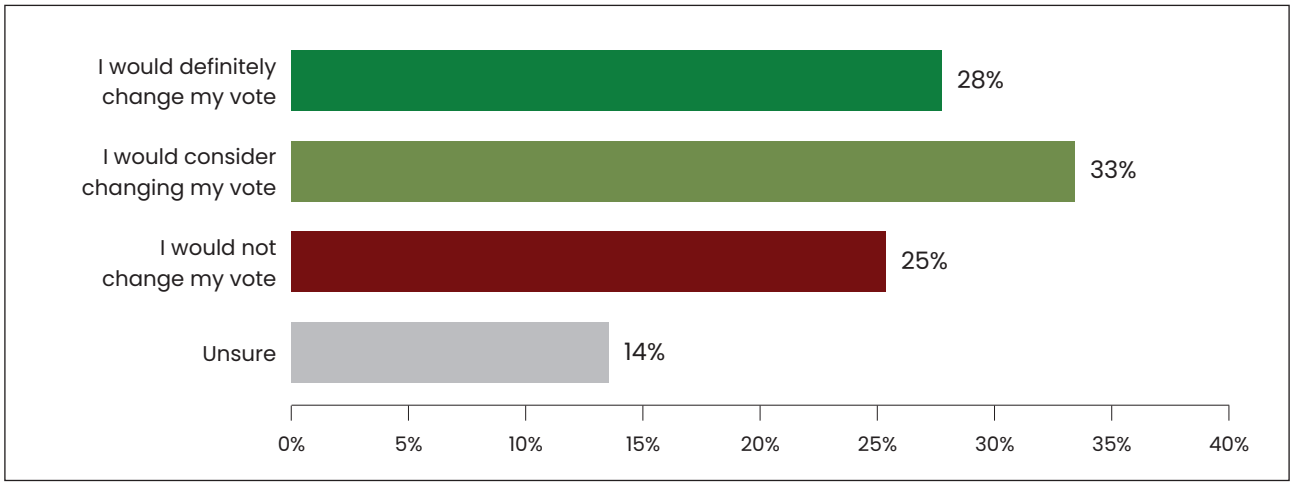
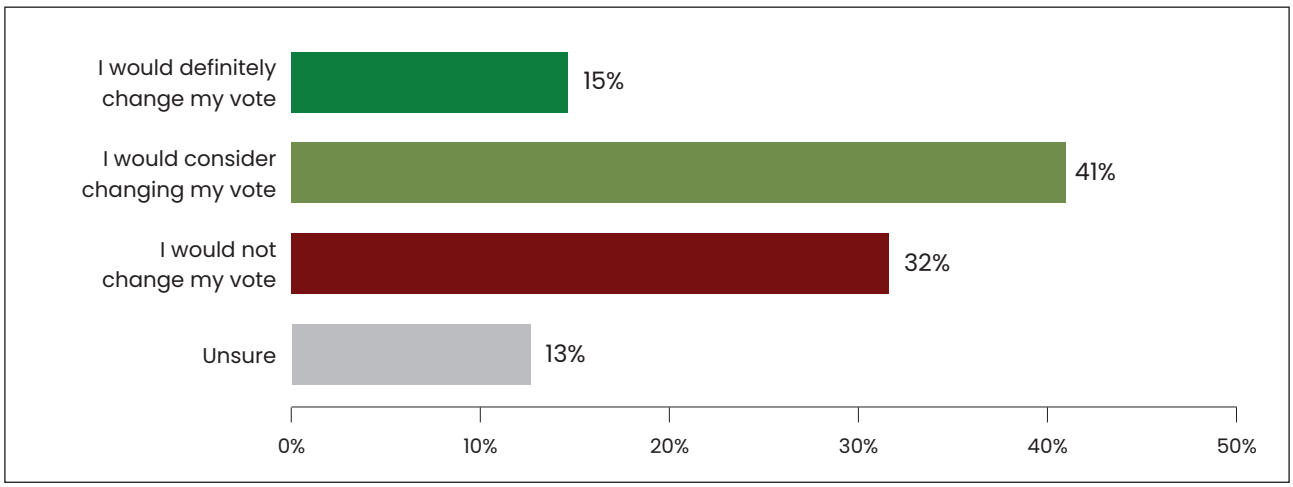


Figure 17: If a Labour government failed to ensure affordable supplies of energy, leading to higher prices now and in the future, how likely would you be, if at all, to change your vote to another Party?



The British public and the current system

One of the notable things that the polling revealed was that the British public is, in fact, quite uninformed about the UK's energy supply system. For example, most Britons think that Russia is the UK's biggest energy supply partner – which Russia neither is, nor ever was. As expected, the British public overwhelmingly supports the decision to cut off Russian imports completely.

Figure 18: To the best of your knowledge, from which of the following nations do you think the UK sources its foreign energy supply?

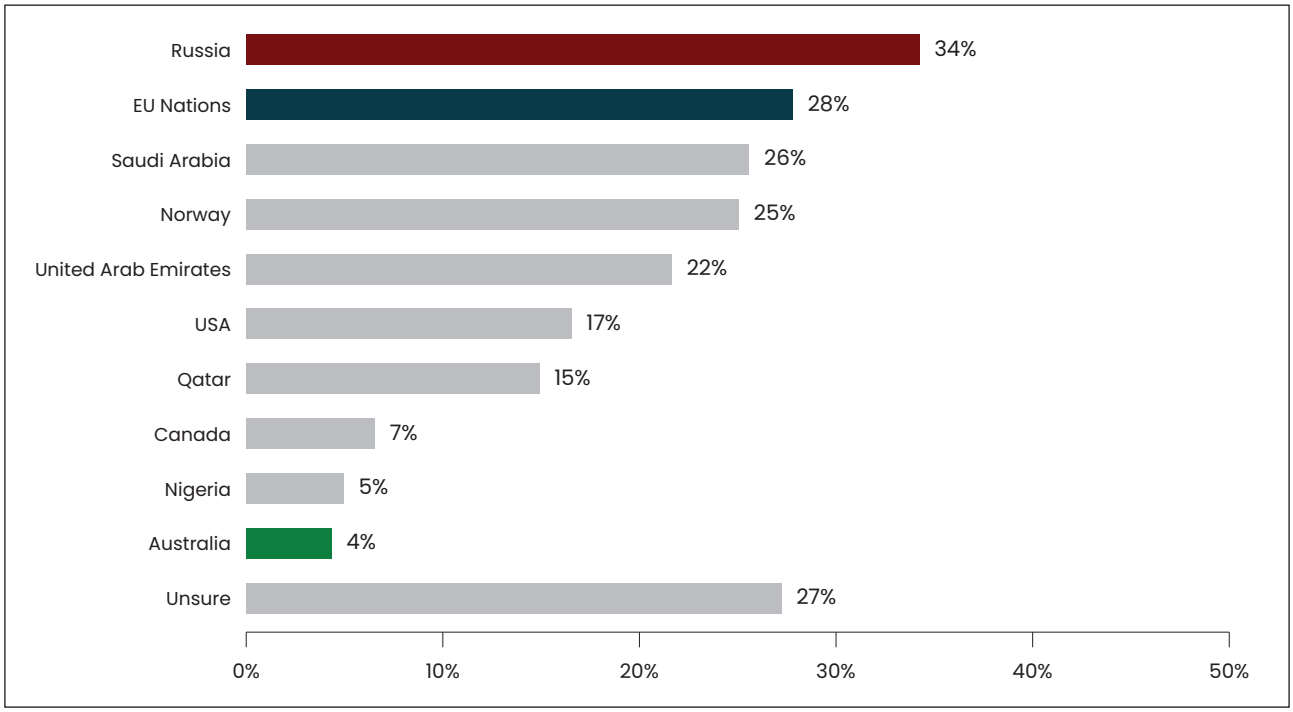


Figure 19: ...and of these, who do you think the UK's SINGLE LARGEST energy trading partner is?

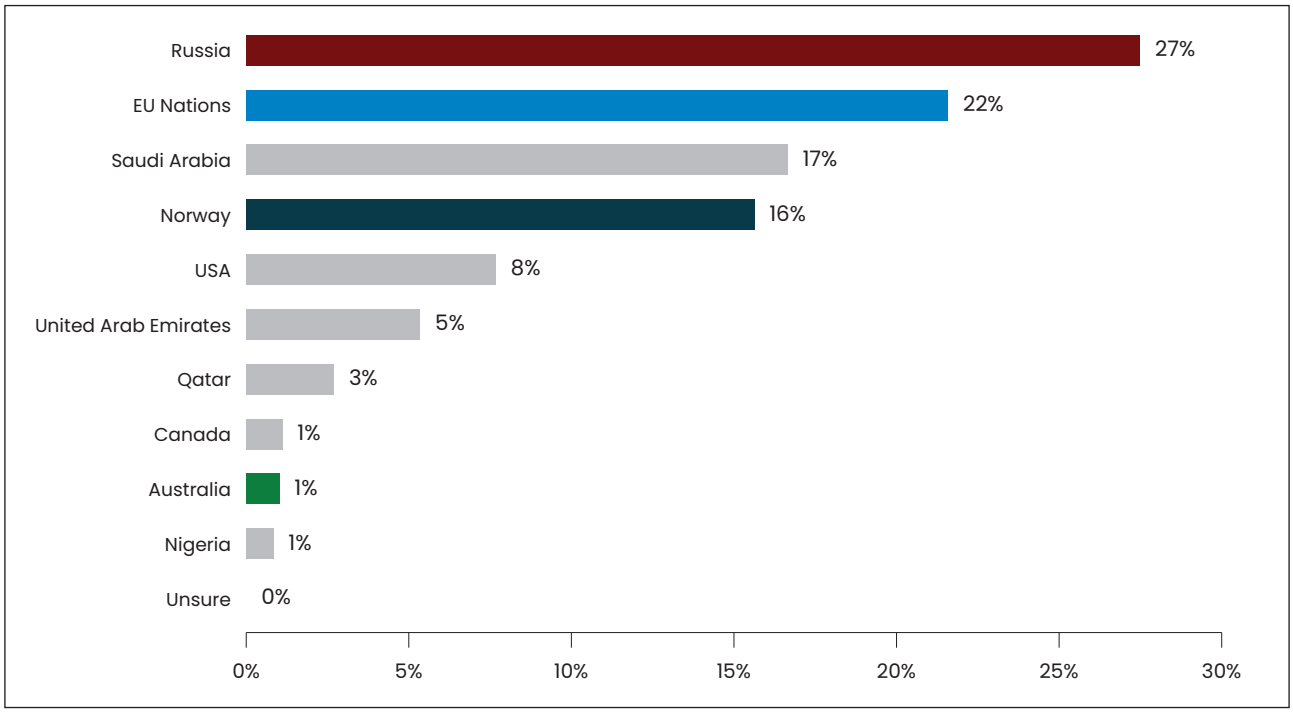


Figure 20: Part of the UK's response to Russia's invasion of Ukraine has been to diversify the UK's sources of energy to reduce the dependence on Russian energy. Do you support or oppose diversifying the number of energy supplying nations?

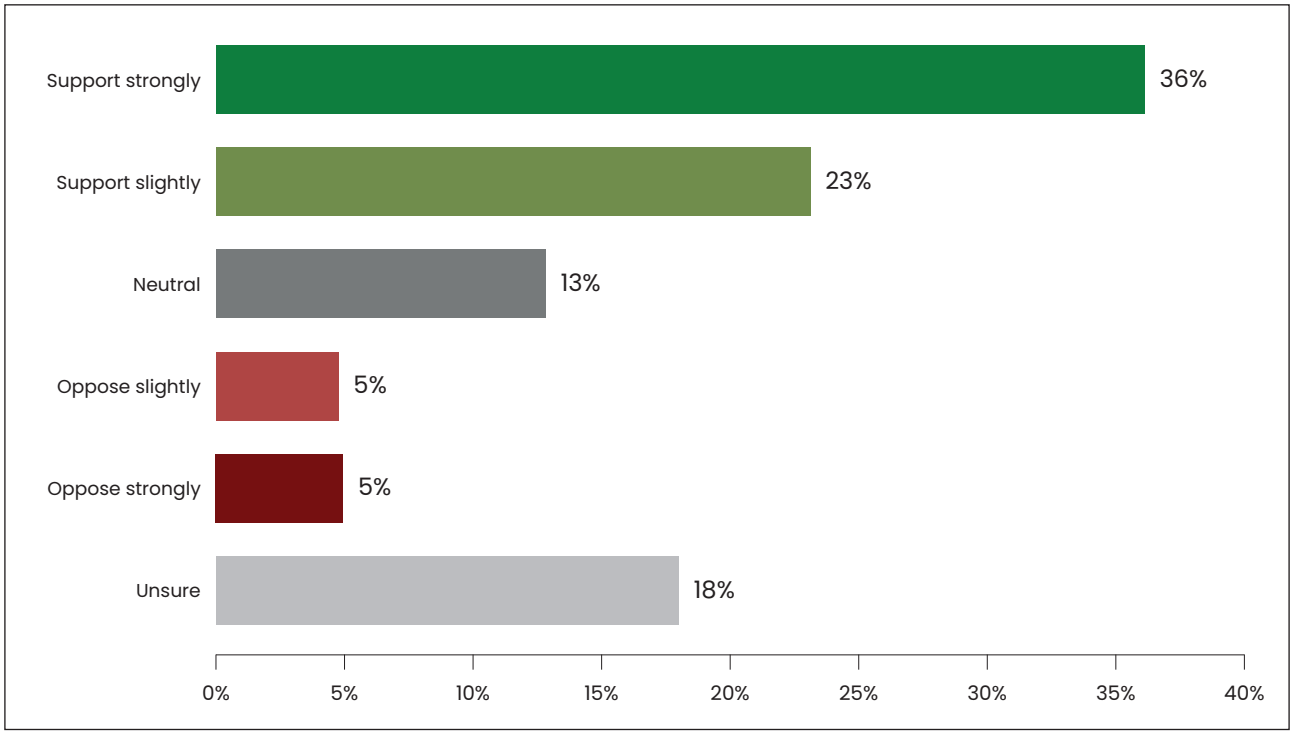
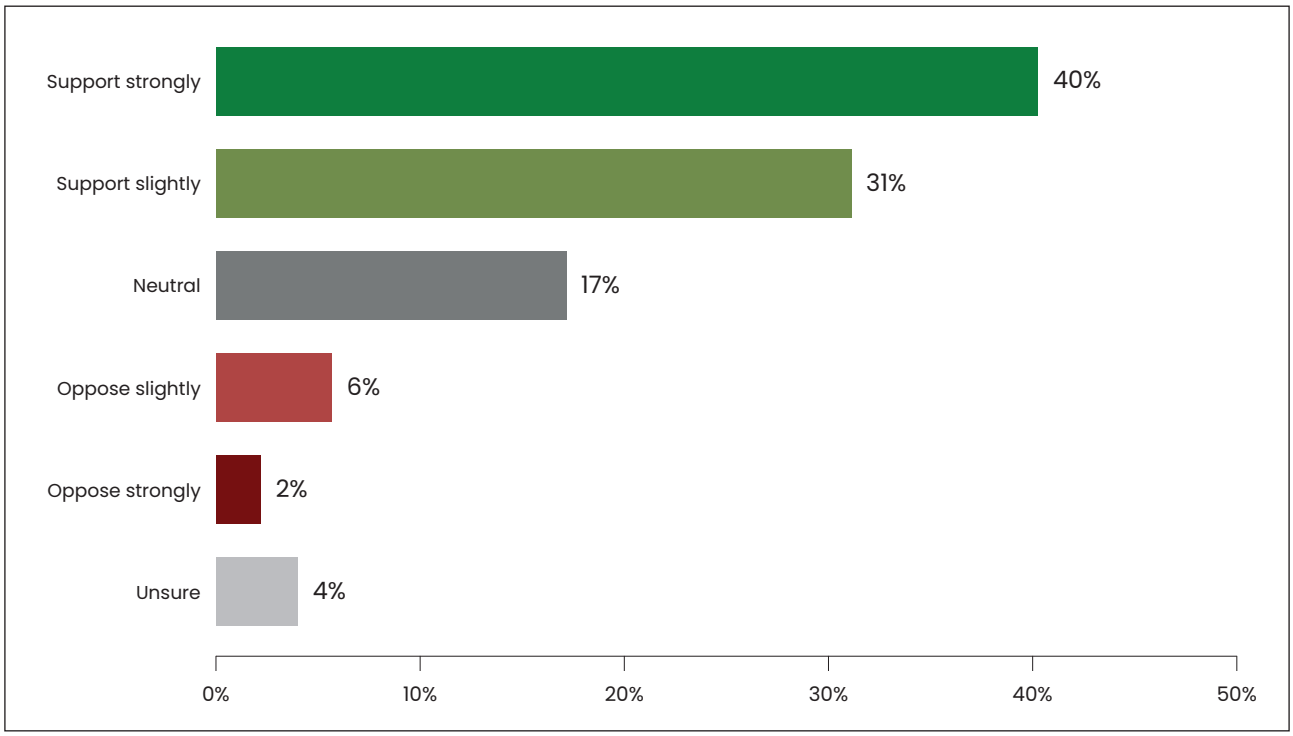
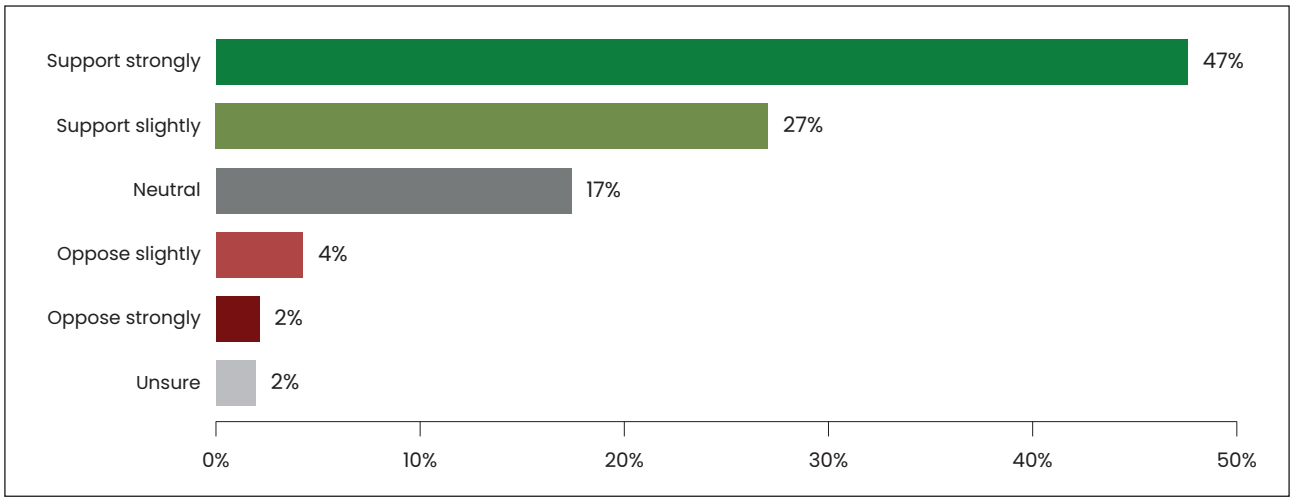


Figure 21: At present, natural gas is the largest energy source for the UK. Currently, the UK has the facilities to store 2% of the country's annual natural gas demand. Do you support or oppose the government investing to create more gas storage in the UK?



After prompting, there is very strong support among the British public to increase the nation's gas storage capabilities, particularly when current UK storage capacity is compared to other European nations.

Figure 22: Do you support or oppose the government investing to create more gas storage in the UK?



Polling reveals that Brits strongly support and are ready for changes around supplier diversification and increasing storage facilities for the UK's primary energy source.

Re-balancing the Energy Trilemma

Interestingly, despite relatively low levels of awareness of the UK's current energy mix, British voters have a relatively nuanced view of the Energy Trilemma and are happy to make certain compromises.

As expected, energy affordability is perceived as the key feature that ought to be prioritised by the Government, with energy security coming a close second and energy sustainability, while considered important, a distant third.

For most Brits, sustainability comes across as a rather distant and remote aim. On the other hand, affordability is something that has an immediate impact on people's day-to-day lives. Thus, it is logical for people to prioritise affordability over sustainability. Second, Russia's invasion of Ukraine has shown just how costly it can be to rely on hostile states for energy supply – which led many people to care much more about energy security. The polling data is largely reflective of these anxieties amongst voters.

Figure 23: In your view, which one of the following is the MOST important for the UK government to prioritise right now?

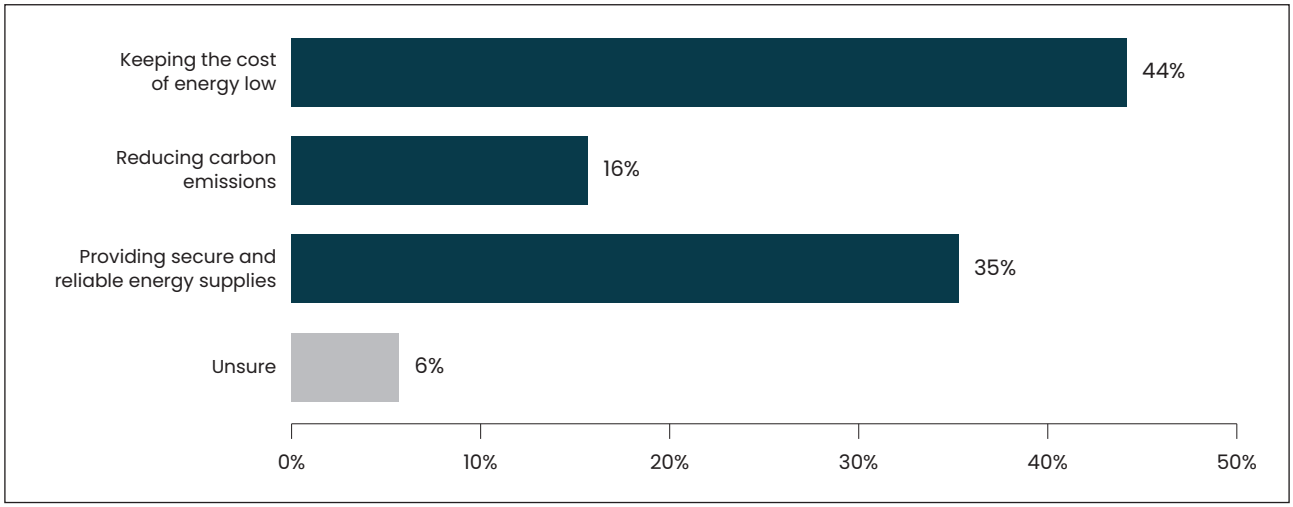
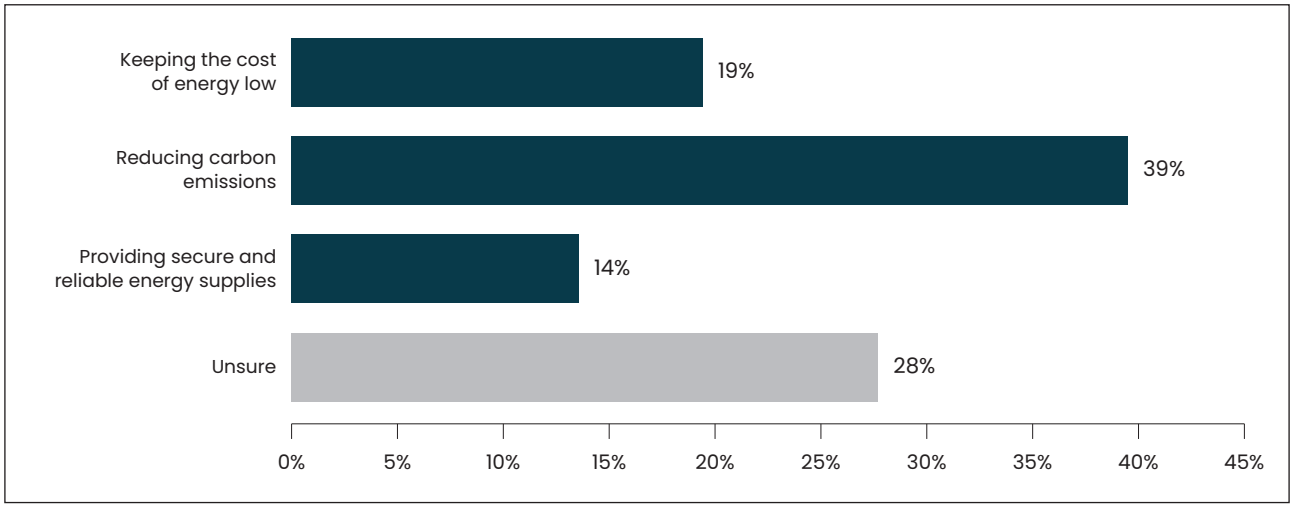


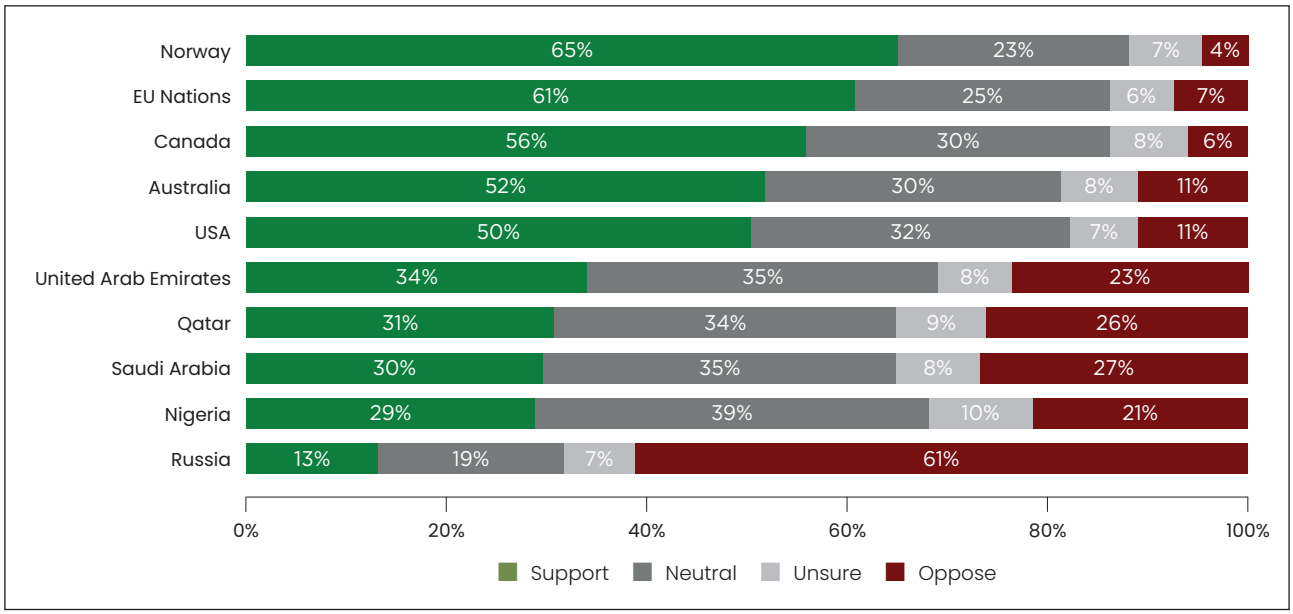
Figure 24: ...and which is the LEAST important for the UK government to prioritise right now?



A clear interpretation of these results is that a majority of British voters believe that energy affordability and security are currently more pressing policy priorities when compared with sustainability objectives.

A secondary conclusion from these results would be that British voters would strongly support energy initiatives that reduce energy prices for consumers and industry, and are prepared to accept a more staged approach to achieving sustainability objectives, such as emissions reduction.

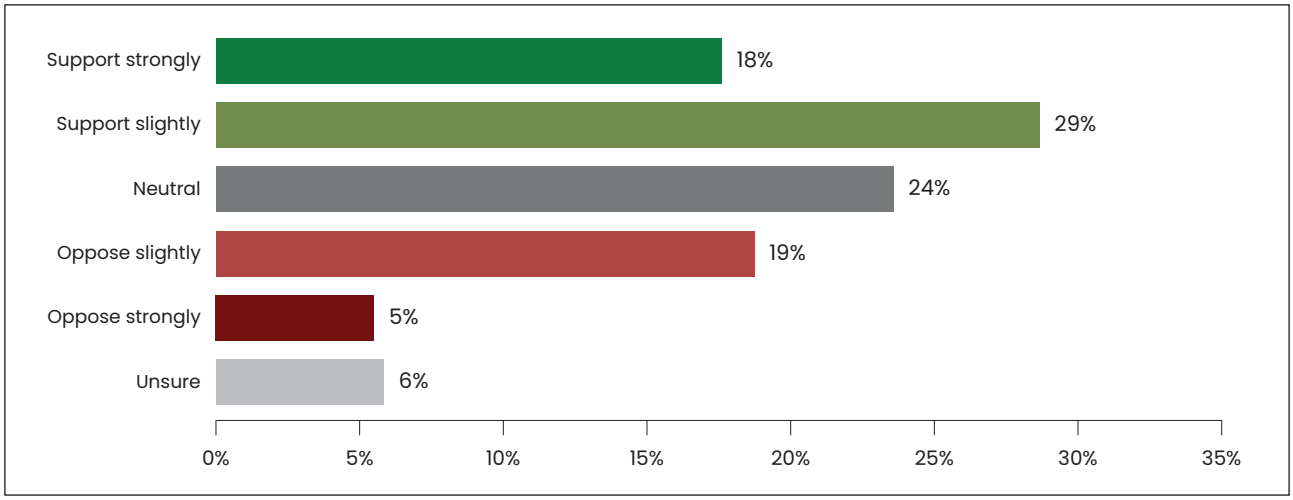
Figure 25: To what extent, if at all, do you support the UK sourcing its energy needs from the following nations?



When prompted with key facts about the UK's current gas import equation, despite Norway being the most supported energy partner, Brits support diversifying away from them as a supplier, with a majority supporting this measure even if it were to cost slightly more.

In so far as carbon intensity fits into the gas import equation, Brits generally support a mix of foreign and domestic supply, though are more likely to support lower carbon gas imported from a friendly country than higher carbon gas produced at home.

Figure 26: At present, the UK's largest energy partner is Norway, with Britain sourcing 77% of its gas imports from Norway alone, largely through pipelines under the North Sea. Do you support or oppose diversifying the number of energy supplying nations, even if it costs slightly more?



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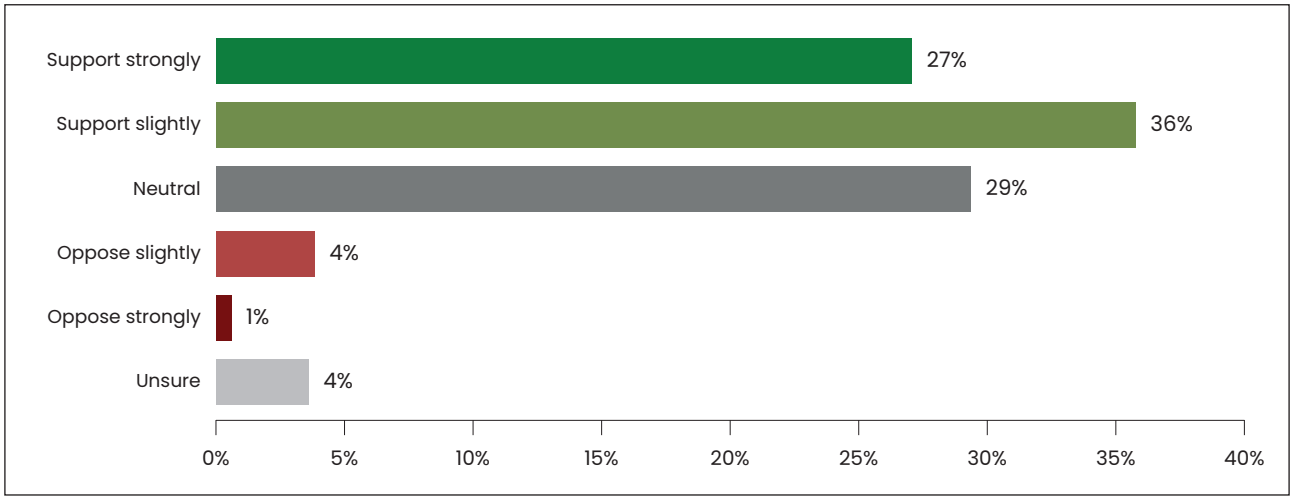


Figure 28: Most emissions produced by natural gas occur during burning, not from transportation. If the UK were to prioritise any of the following, which would you prefer?

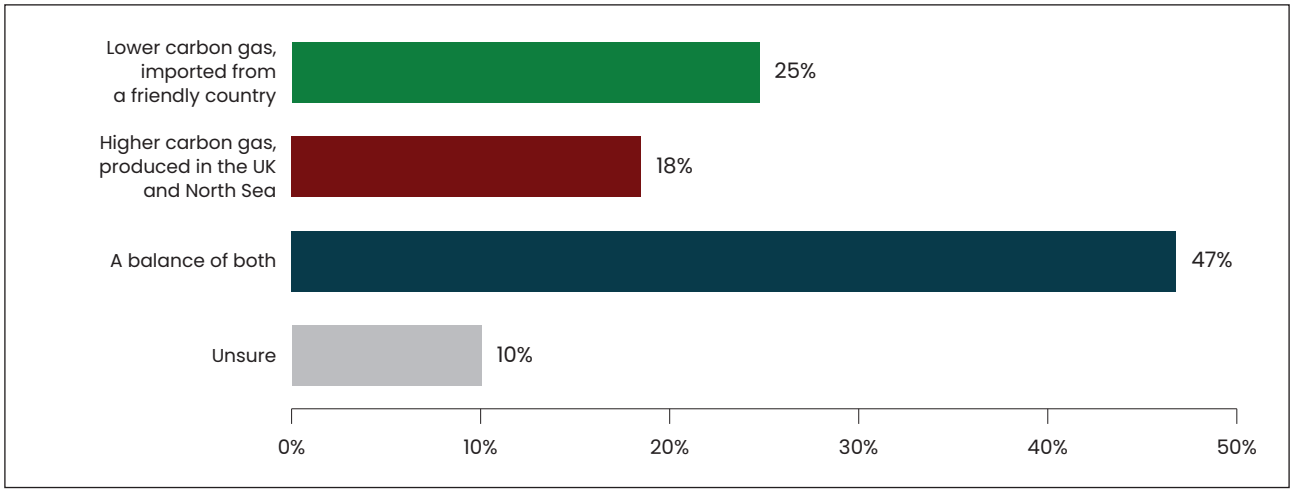


Figure 29: ...and which way are you leaning towards MOST?

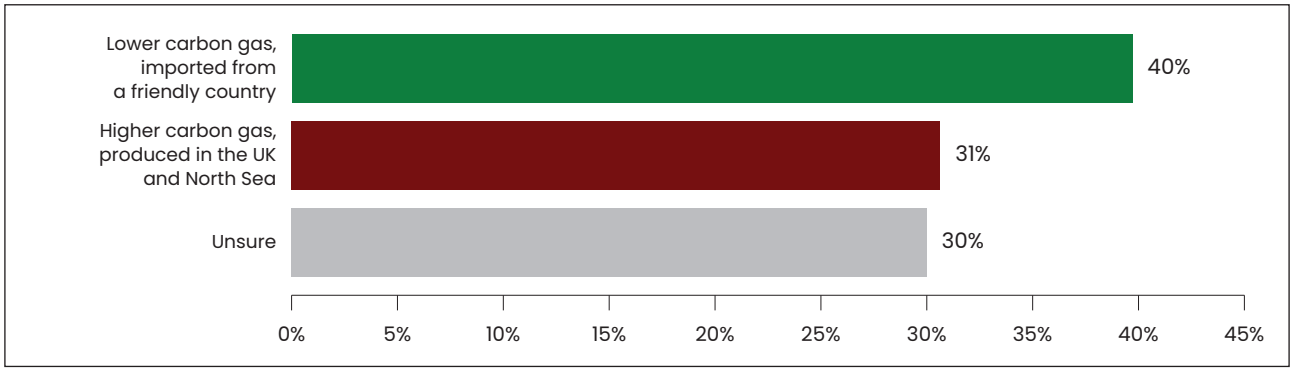
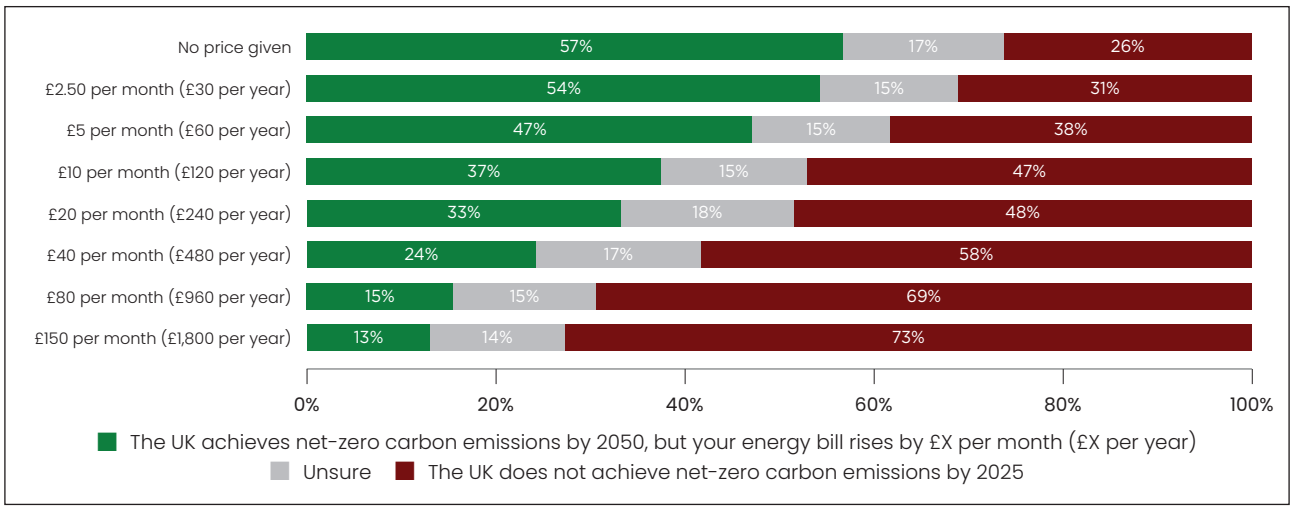


Figure 30: If you had to choose between the following, which outcome would you prefer?



The additional price that most Brits have a willingness to pay is between £5 and £10 extra per month for Britain to achieve net zero carbon emissions. Interestingly, voting patterns in the most recent General Election and the 2016 EU Referendum are shown to have a notable impact on people's willingness to pay.

Figure 31: If you had to choose between the following options, which outcome would you prefer? (Net Score)

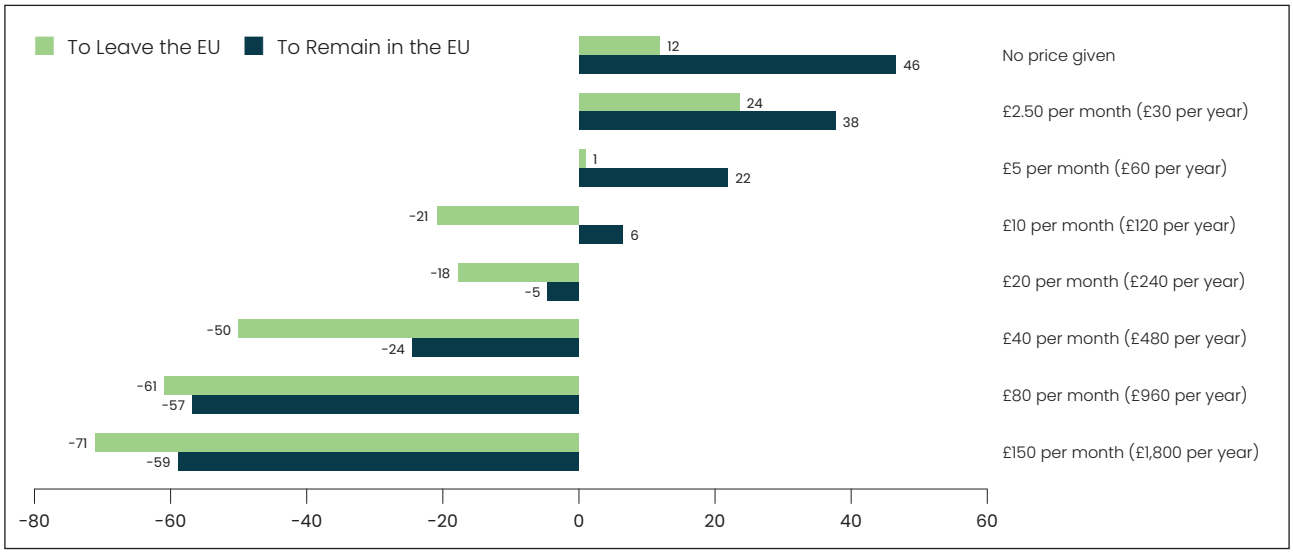
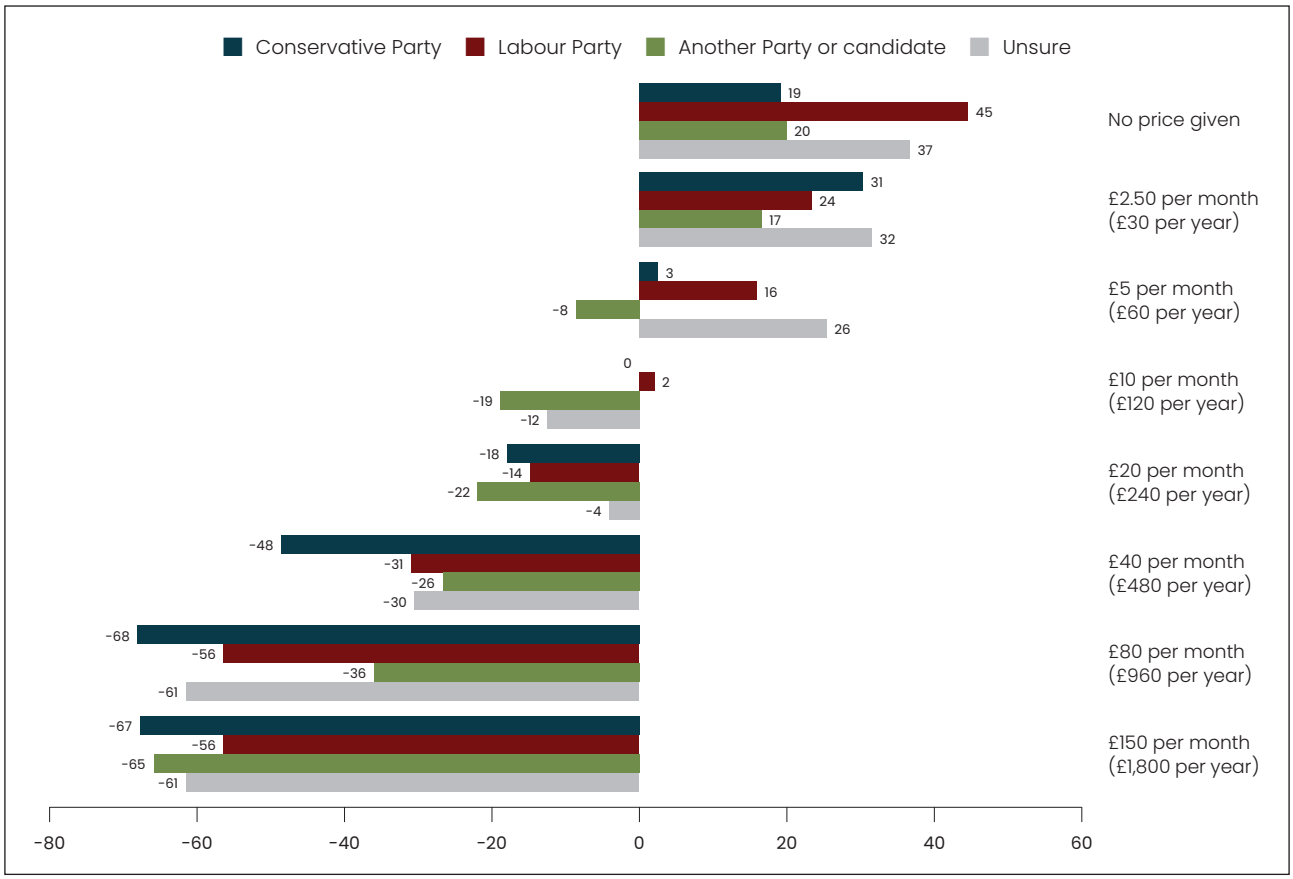


Figure 32: If you had to choose between the following options, which outcome would you prefer? (Net Score)



Views towards gas

Finally, since gas remains the key focus of this paper and is also the main source in Britain's energy mix, we wanted to see how the British people viewed gas and its usage in the energy supply system. We found that British people support gas as an energy source and see it as an important component of energy security, affordability and also sustainability.

Figure 33: In your view, how important is natural gas in helping the UK address the following issues:

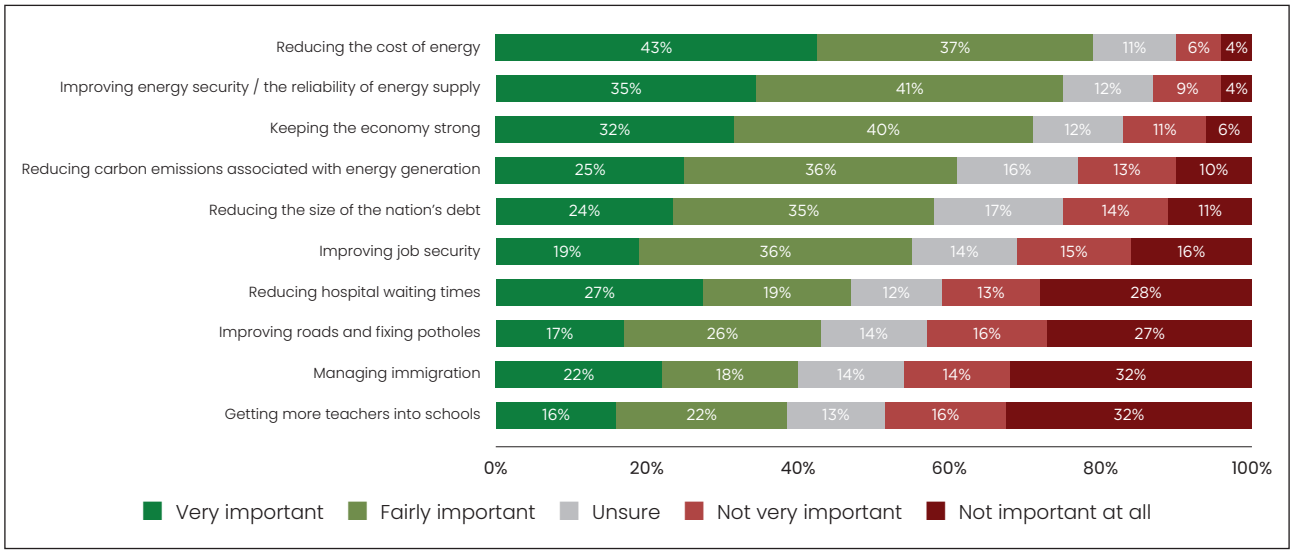


Figure 34: In your view, how important are each of the following, if at all, for ensuring that the UK transitions to Net-Zero carbon emissions by 2050?

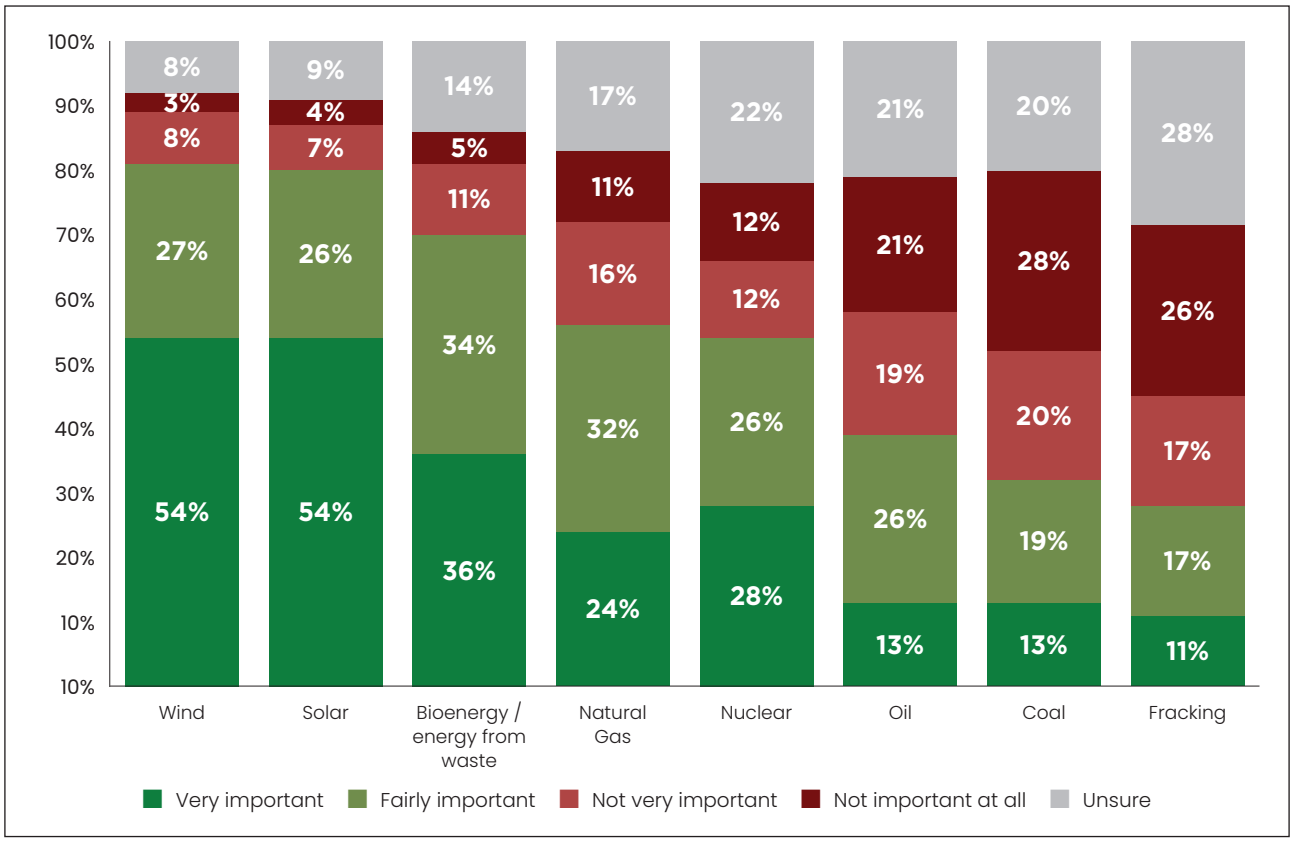


Figure 35: In your view, how important are each of the following for ensuring that the UK is energy secure?

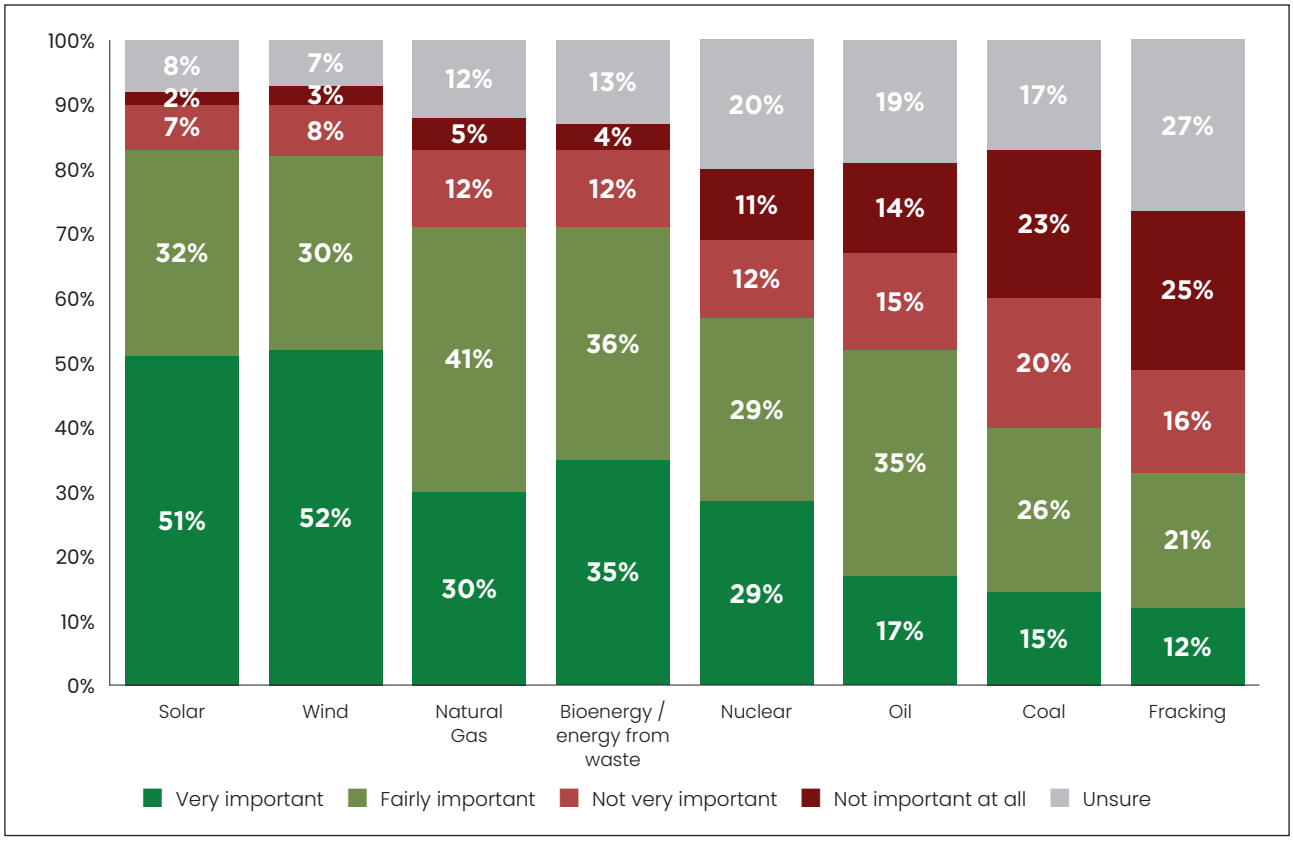


Figure 36: In your view, how important are each of the following, if at all, in keeping the UK's energy supply cheap and affordable?

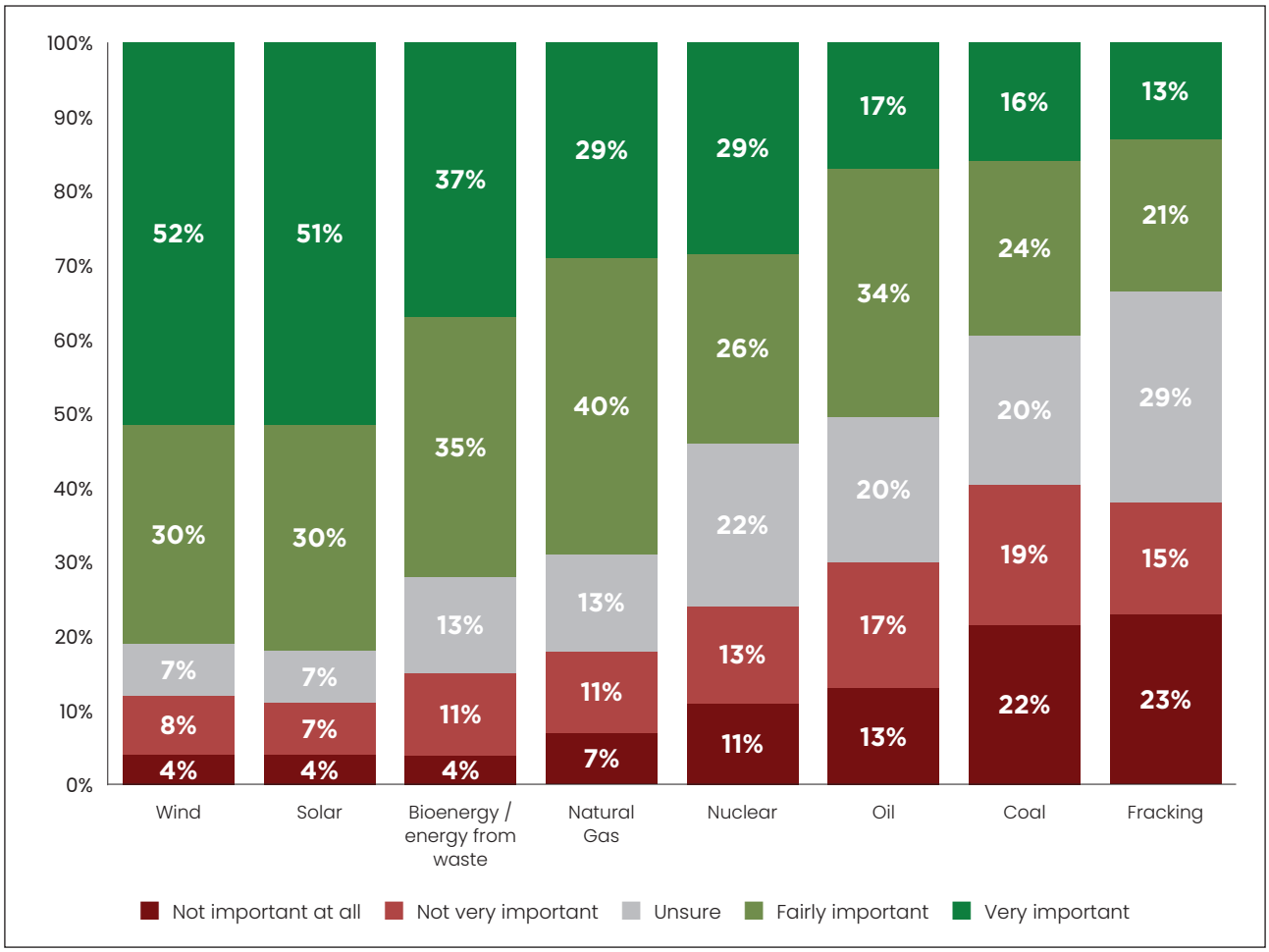
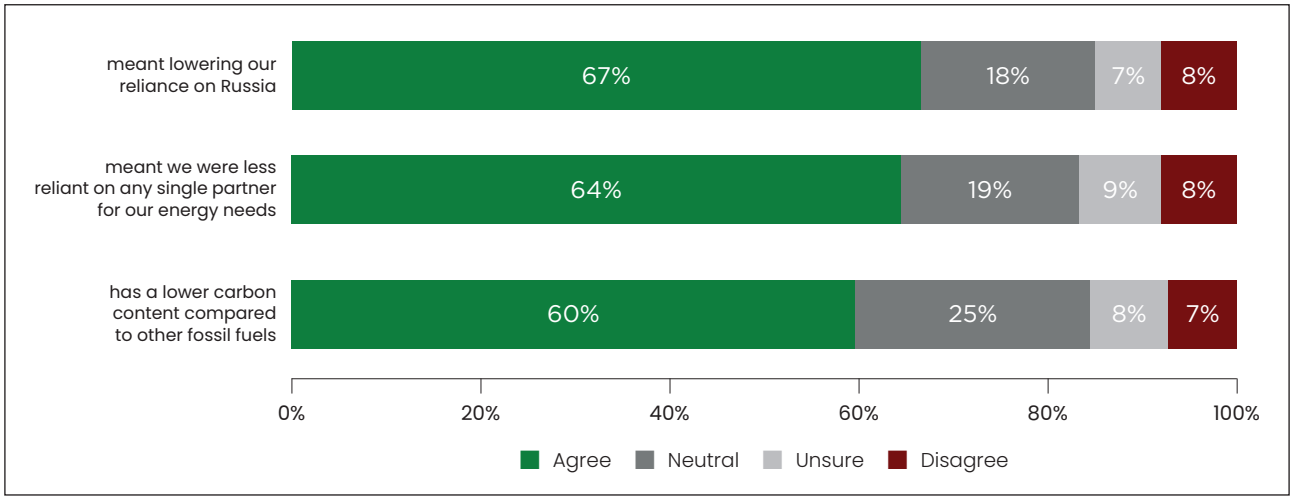


Figure 37: I would support more natural gas coming to the UK from different countries, if it...



What is more, the British public very clearly recognises the importance of natural gas in the energy supply system, with many supporting the UK using more energy from natural gas.

Thus, as the UK Government continues to plan for how to adapt its energy system, it is important to have in mind the strong level of support that British people have for continued, and increased use, of natural gas.

Figure 38: Do you support or oppose the UK using more energy from natural gas?

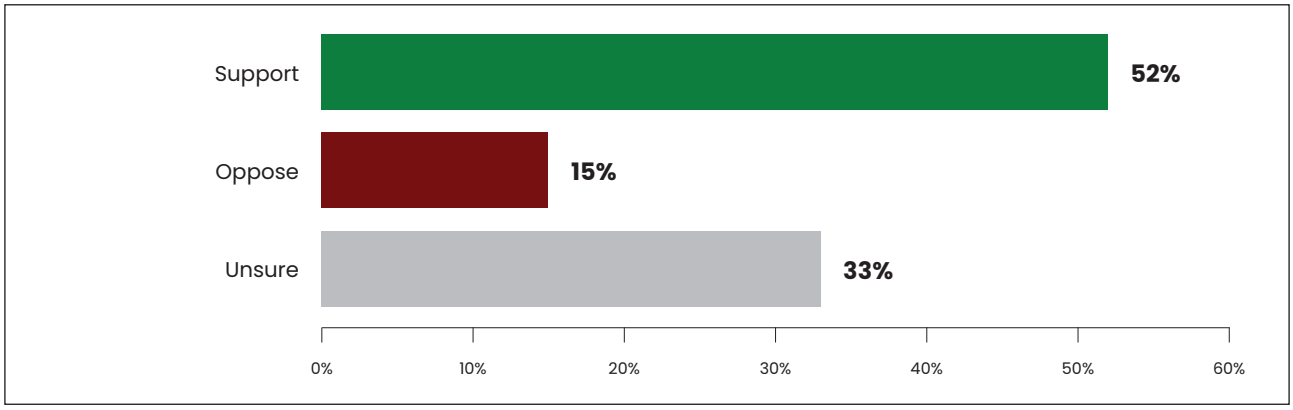
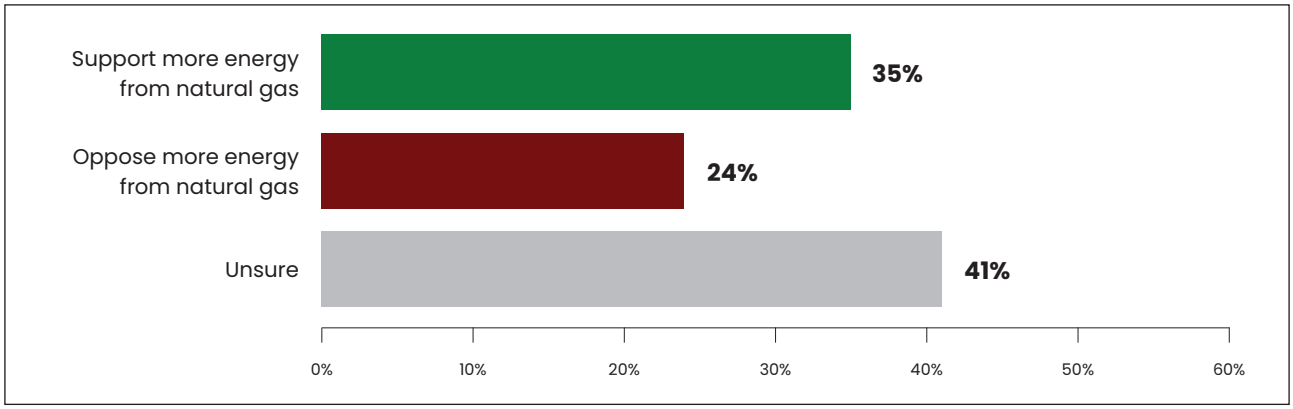


Figure 39: ...and which way are you leaning towards MOST?



A clear majority of British voters support the role of gas in the nation's energy mix and, despite the significant existing use of gas in Britain, when nudged, show support for further expanding the role of gas. There is a clear recognition of the valuable role that gas plays and its importance in tackling the country's future energy challenges.

Figure 40: Do you support or oppose the UK using more energy from the following sources?

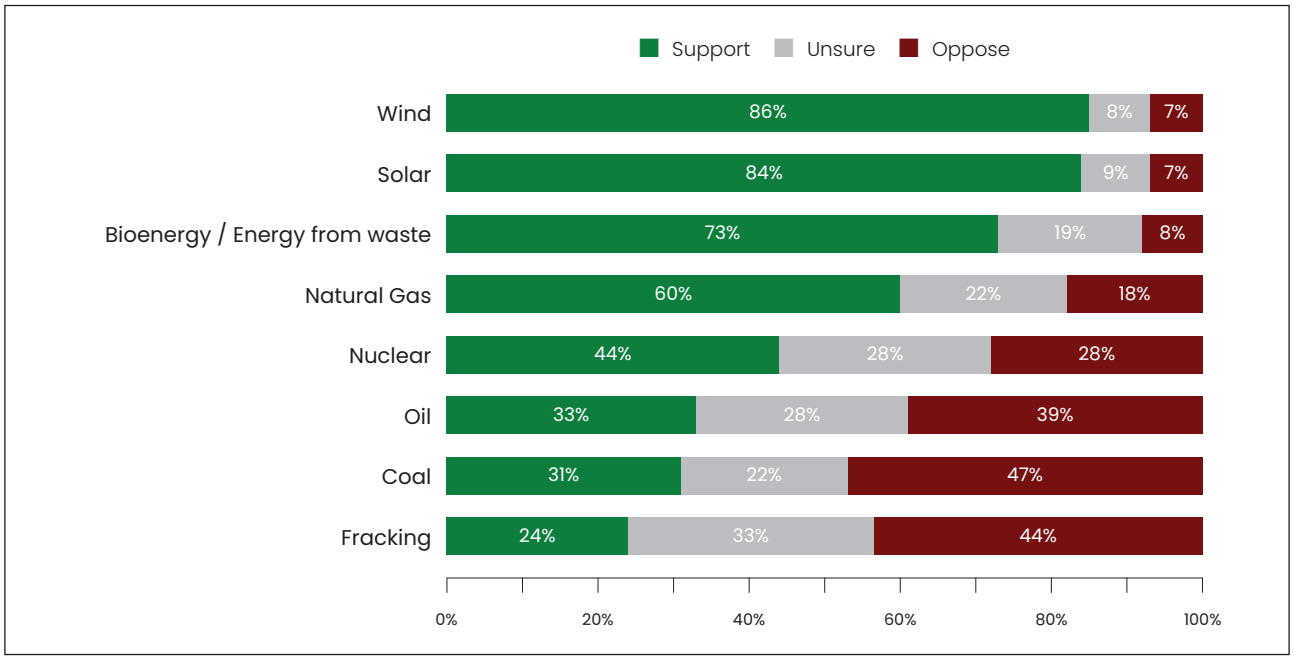
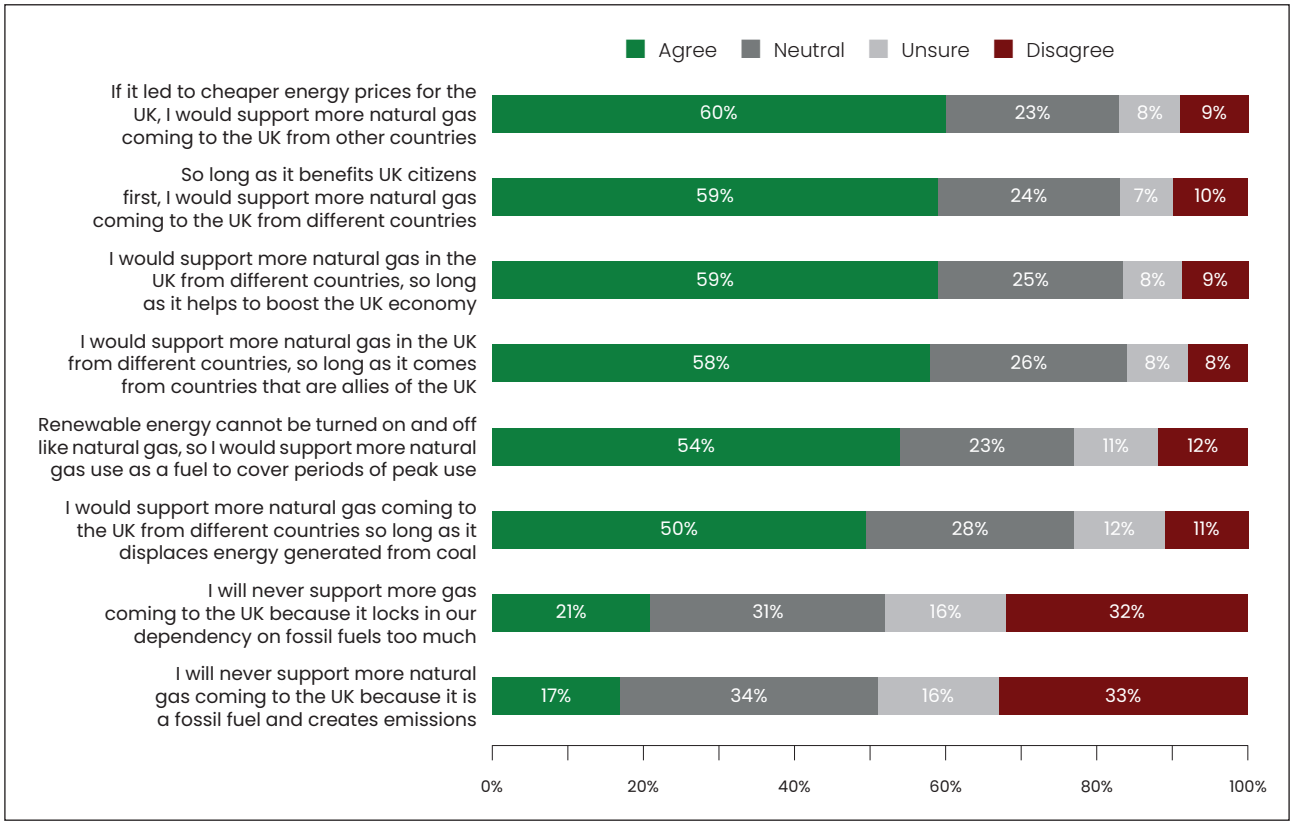


Figure 41: Do you agree or disagree with the following statements?



Overall, the British public's view can be summarised in the following way: Brits want their energy to be as cheap as possible, with affordability being the key factor that they prioritise. However, most are also aware that energy security matters, and support the diversification of the UK's energy supply – with significantly more Britons willing to pay a *limited* price for establishing a more diverse and secure network of energy suppliers. Moreover, British people do care about the environment – though to a lesser degree, meaning they are happy to have pro-sustainability policies, as long as they do not mean that consumers incur significantly higher costs.

Finally, most Brits see gas as an extremely important component of the energy supply system in the UK, with most supporting natural gas as an energy source and wishing to see more of their energy come from natural gas.

In addition, the British public recognises the importance of gas in addressing all three elements of the Energy Trilemma – security, affordability and sustainability.

Thus, to adequately address the Energy Trilemma in the UK, the Government must think more about the role of gas, and how gas supply diversification can better answer questions of energy affordability, sustainability and security.

The importance of this topic and the impact it will have on the upcoming election suggests that any political party that wishes to be successful at the next General Election must come up with adequate solutions to meet the demands of British voters on energy policy.

In the following section, we discuss some of the key policy recommendations that ought to be adopted. We argue that those policies are best suited to addressing some of the problems of the UK's current energy system, and that they are likely to be supported by the British public as they represent an adequate balance of the three key priorities of the Energy Trilemma.

Policy Recommendations

As the UK is likely to be faced with another difficult winter, there are a few things the Government could do in the short-term to mitigate the negative impact of the energy cost crisis. First, it could promote energy-efficient behaviour, for example by offering financial (and other) incentives to businesses and public institutions that opt for energy-saving behaviour. [35] Second, in critical times like these, the Government could start tactical information campaigns that would serve to inform people about energy conservation behaviour in the short-term, whilst the Government begins to diversify the nation's gas supply. [36] However, in the medium- to long-term, beyond the current energy crisis, there must be a structural policy focus on supply-side solutions.

Diversity of supply

The UK has fared much better than some of its European counterparts when it comes to energy supply partners. Notably, the UK was never as heavily reliant on Russia for gas – and subsequently, does not have to re-think its whole energy supply system in light of the invasion and subsequent sanctions against Russia. Beyond the UK's major supplier being Norway, significant gas volumes have historically been supplied by the autocratic countries of Qatar and Russia which presents ongoing geostrategic risks. Moreover, such high reliance on Norway also carries risks. For example, after the "leaks at the Nord Stream pipelines in the Baltic Sea, Norwegian authorities are also concerned that their pipelines carrying gas to Europe are at risk of sabotage." [37] Indeed, if anyone were to sabotage the Norwegian pipeline, the UK would find itself in an extremely difficult position due to its overreliance on Norway.

Further diversification of gas supplies is needed, and the ideal sources are LNG exporters that are UK allies, such as the United States or Australia. Notably, in 2022, the UK "agreed to double imports of US gas over the next year as it tries to stabilise soaring energy prices." [38] Thus, in the coming years we are likely to see more US gas coming to the UK – which is good both for diversification but also energy security, as the US is a long and stable ally of the UK.

To further diversify its network, the UK could potentially turn to Australia, the world's largest LNG exporter; a democratic country with a similar political system, culture and values, it would be a stable and reliable partner. But, in the past, such imports from "the Asia-Pacific region [were] rare because of the economics of lengthy journeys and usually high demand from Asian buyers." [39]

Nevertheless, the doors for importing from Australia opened again in 2022 when, following Russia's invasion of Ukraine and the subsequent energy crisis, the UK received "liquefied natural gas from far-off Australia for the first time in at least six years, highlighting the European region's desperation in grappling with its worst energy crisis in decades." [40]

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35 Dr Helena Ivanov, "Winter is Coming: How the UK Should Respond to Russia's Weaponisation of Energy Sources This Winter", *The Henry Jackson Society*, August 2023, https://henryjacksonsociety.org/wp-content/uploads/2023/08/Winter-is-Coming-Report-2023-Dr-Helena-Ivanov.pdf.

36 Rob Gross, Jan Webb, et al., "Review of Energy Policy 2022", UK Energy Research Centre, December 2022, https://ukerc.ac.uk/publications/rep22/.

37 Liv Klingert, "Norway fears gas pipeline to Europe may also become target for sabotage", *The Brussels Times*, 29 September 2022, https://www.brusselstimes.com/297789/norway-fears-gas-pipeline-to-europe-may-also-become-target-for-sabotage.

38 "UK aims to double US gas imports under new deal", *BBC News*, 7 December 2022, https://www.bbc.com/news/business-63885968.

39 Anna Shiryaevskaya and Ann Koh, "UK to Import Rare Australian Gas Cargo in Latest Sign of Desperation", *Bloomberg*, 16 August 2022, https://www.bloomberg.com/news/articles/2022-08-16/uk-to-import-rare-australian-gas-cargo-as-energy-crisis-builds#xj4y7vzkg.

40 Ibid.

Accessing gas sustainably

Australia's Northern Territory Government is moving forward with developing the Beetaloo Basin which is considered "one of the world's largest untapped gas reserves." [41] Estimates suggest the Beetaloo Basin has up to 500 trillion cubic feet of gas available, [42] putting it on a par with some of the world's largest gas basins, such as the Marcellus Basin on the US East Coast. The Beetaloo Basin's low CO2 gas has the added sustainability benefit of being net zero for scope 1 emissions from first production as enforced under Australia's climate legislation. [43]

Gas reserves with low CO_2 properties are not limited to this basin, although it is the most globally advanced in terms of net zero emissions requirements. With significant policy and technological changes in the global gas production sector helping to reduce emissions, the International Energy Agency (IEA) now estimates over 20% of global oil and gas production is covered by 2050 net-zero commitments. [44]

These reductions have been made possible by the full commercialisation of mature emissions reduction technologies, such as carbon capture and storage, and electrification of LNG and drilling processes. The Beetaloo Basin could offer a sustainable and strategic response to LNG supply challenges discussed above.

Thus, including Australia's LNG into the supply equation could be another way to diversify the energy supply network. And it seems that this would be a move that the British public would support, especially if it meant that the prices would go down.

Figure 42: Would you support or oppose importing Australian natural gas from the Beetaloo basin?

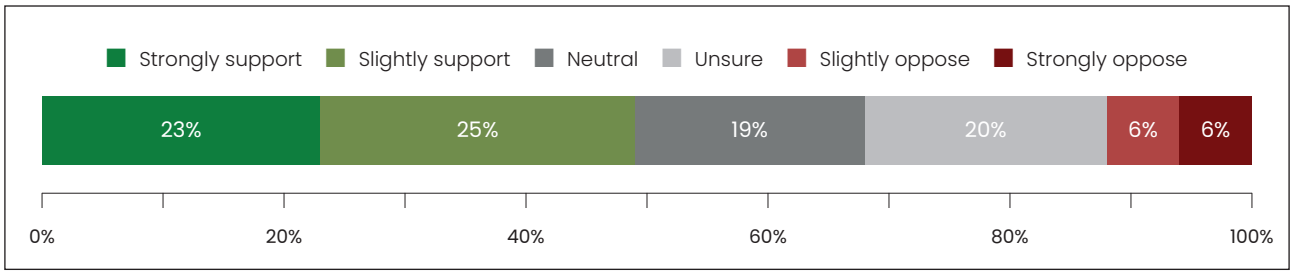
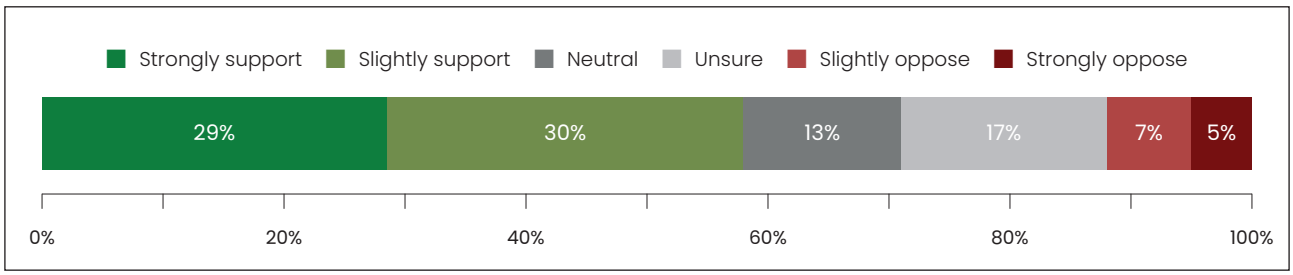


Figure 43: Would you support or oppose importing Australian natural gas from the Beetaloo basin, if it were to help keep gas prices low?



41 Colin Packham, "Environment stoush erupts on NT approval of fracking in Beetaloo", *Financial Review*, 3 May 2023, https://www.afr.com/companies/energy/environment-stoush-erupts-on-nt-approval-of-fracking-in-beetaloo-20230503-p5d5af.

42 "Beetaloo Sub-basin", Northern Territory Government, 9 June 2023, https://territorygas.nt.gov.au/projects/beetaloo-sub-basin.

43 Chris Bowen MP, "Safeguard Mechanism one step closer to Parliamentary passage", Commonwealth of Australia, 27 March 2023, https://minister.dcceew.gov.au/bowen/media-releases/safeguard-mechanism-one-step-closer-parliamentary-passage.

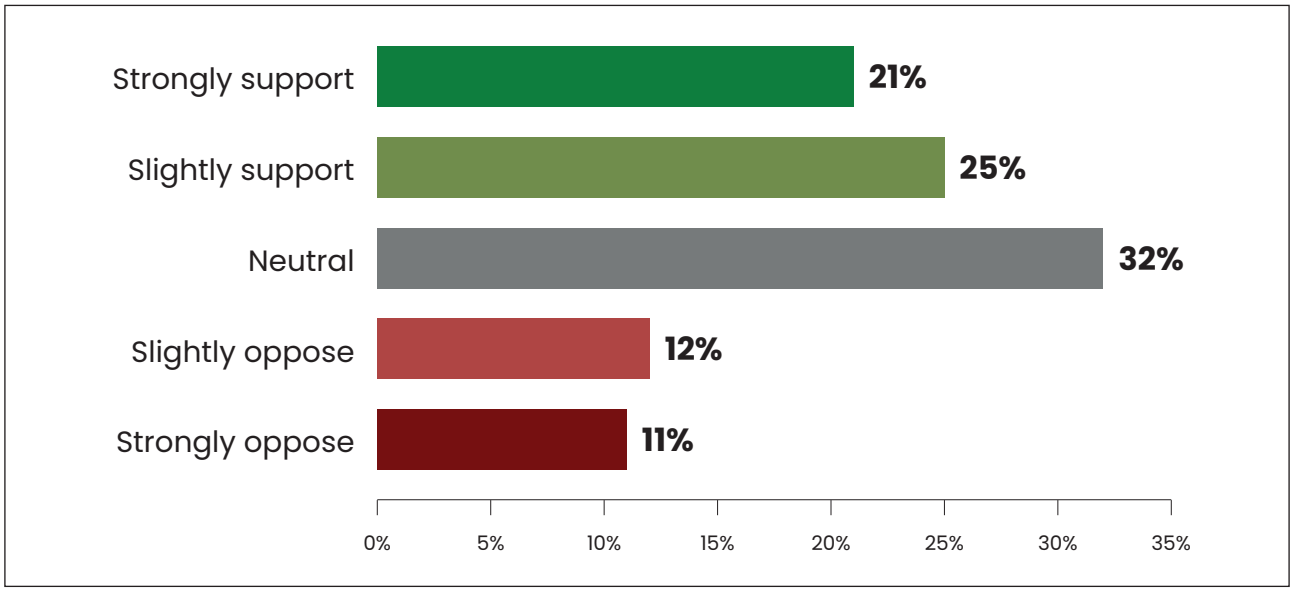
44 "A new era for CCUS", IEA, https://www.iea.org/reports/ccus-in-clean-energy-transitions/a-new-era-for-ccus.

However, similar to the debates around North Sea drilling, some people have raised concerns about the impact Beetaloo Basin may have on the environment. [45] On the other hand, the Australian Government and others have highlighted that the additional supply coming from Beetaloo Basin could address serious future shortages, create more jobs and benefit the economy in both countries. The Australian Government has also announced that all recommendations from a comprehensive 2018 scientific inquiry into social and environment impacts have been met. [46] However, if the UK was to turn to the Beetaloo Basin and Australia's LNG, factoring the environmental costs and ensuring transparency for the public would be vital. As it stands, and on the basis of our polling data, if Beetaloo Basin can ensure lower costs and more security (with Australia being a reliable partner to the UK), most British people would support such imports – given their prioritisation of security and affordability over sustainability concerns.

Less reliance on imports

The UK has already opted for more North Sea drilling in an attempt to rely more on domestic rather than imported gas. The UK has a significant domestic gas resource available between the North Sea offshore fields and onshore shale gas deposits. [47] The decision to allow North Sea drilling also seems to enjoy the public's support – with 46% suggesting they strongly or somewhat support it and 23% saying they slightly or strongly oppose it. And indeed, if North Sea drilling shows itself to be as profitable and resourceful as the current Prime Minister claims it will be, that will ensure further decreases in imports.

Figure 44: To what extent, if at all, do you support the expansion of North Sea oil and gas production?



Finally, the UK remains committed to net zero by 2050 and, in general, turning towards sustainable sources of energy would not only decrease reliance on imports, but it would also decrease reliance on fossil fuels more generally in the long run – and as such would reduce the price of electricity. Of course, it would be naïve to assume that gas can be completely taken

[45] Miki Perkins, "NT approves Beetaloo gas fracking despite climate fears", *The Sydney Morning Herald*, 3 May 2023, https://www.smh.com.au/environment/climate-change/nt-approves-beetaloo-gas-fracking-despite-climate-fears-20230503-p5d5ae.html.

[46] Packham, "Environment stoush erupts on NT approval of fracking in Beetaloo".

[47] "UK Oil and Gas Reserves and Resources", Oil and Gas Authority, 2017, https://www.nstauthority.co.uk/media/4425/uk-reserves-and-resources-v1.pdf.

out of the equation as the UK transitions to net zero – thus, coupling all the policies discussed above is likely to be good for affordability, sustainability and security while also being realistic about the fundamental need for gas to support the energy transition to a low emissions future.

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