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1922 Backbench Committee on Business, Energy and Industrial Strategy

INQUIRY:

Energy Market Reform: Tackling the energy trilemma

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Research and Secretariat support provided by Onward



Setting the Scene

Foreword by Rt Hon. Dame Andrea Leadsom DBE MP, Jo Gideon MP, and Rt Hon. Lord Lilley

Since 2010, Conservative-led Governments have driven rapid progress in decarbonising the UK's energy system. For example, in 2020, solar and wind produced nearly 30% of the UK's electricity in 2020, a tenfold increase on 2010.¹ In fact, the UK has achieved a 50% drop in carbon emissions since 1990.² In addition, the UK was the first major economy to legislate for Net Zero emissions by 2050.³ In percentage terms, the only two European nations to have achieved a greater emissions reduction than the UK are Ukraine and Denmark.⁴

But Vladimir Putin's invasion of Ukraine has put extraordinary pressure on countries' energy systems, with natural gas now in short supply globally, and particularly in Europe. While the risk to UK security of supply remains low, the Russian invasion demonstrated the importance of what is sometimes called the "energy trilemma" – keeping the lights on, whilst keeping bills down and decarbonising.

This report recommends reforms for the next phase of the UK's energy system, with a focus on all three legs of the trilemma. Our overriding conclusion is that urgent Government action is needed, both on promoting domestic energy generation and on facilitating energy demand reduction.

¹ BEIS (2021), [UK Energy Brief in 2021](#), p.28.

² BEIS (Feb 2022), [UK Greenhouse Gas Emissions, Final Figures](#)

³ BEIS, Rt Hon. Chris Skidmore MP (June 2019), [UK becomes first major economy to pass net zero emissions law](#)

⁴ William Lamb, Michael Grubb, Francesca Diluio & Jan C. Minx, *Climate Policy* (Nov 2021), [Countries with sustained greenhouse gas emissions reductions: an analysis of trends and progress by sector](#)

To do this requires significant leadership focus on the entire energy brief which, we argue, should be separated out from the rest of BEIS, with its own Secretary of State and with a clear mandate to resolve the UK's energy trilemma.

In July 2022, Rishi Sunak pledged to re-establish the separate Department of Energy. Speaking to *The Telegraph* he committed to re-establish a separate Department of Energy and to introduce a legal target to make the UK energy self-sufficient by 2045, achieving what he dubbed "energy sovereignty".

Sunak said, "As energy bills skyrocket in the wake of Russia's invasion of Ukraine, it has never been more important that our country achieves energy sovereignty, so that we're no longer reliant on the volatility of the global energy supply."

"That's why as prime minister I would introduce an ambitious new plan to make the UK energy independent, investing in vital new technologies."

"I am committed to Net Zero by 2050, but that can't mean neglecting our energy security. So although the legal target for energy sovereignty will be 2045 and I will work night and day to ensure we beat that target, securing a safer future for the next generation."⁵

Background

Over four meetings held on Tuesday 1st November, Tuesday 15th November, Tuesday 29th November, and Tuesday 13th December 2022, the 1922 Backbench Committee on Business, Energy and Industrial Strategy held this inquiry. The question it sought to address was how the UK's energy markets should be reformed for the next stage of the UK's energy transition.

The focus of the discussions was on unblocking renewables, cutting energy demand, making electricity demand more flexible, and the future of the Energy Price Guarantee. The meetings were open to all backbench Conservative MPs, and the Committee invited a number of energy, industry and business experts to provide evidence.

⁵ Nick Gutteridge, *The Telegraph* (July 2022), [Rishi Sunak pledges not to build more onshore wind farms](#)

“We have historically been a world leader in energy technology and have the potential to lead the world again in the delivery of energy transition to net zero, bringing economic growth and jobs to every corner of our United Kingdom – but the government must act fast and take the necessary decisions now to ensure successful and timely investment and innovation.”

David Duguid MP, Member of Parliament for Banff and Buchan

Policy Proposals

1. Unblocking renewables

- 1.1. Implement the new National Policy Statement for renewables.
- 1.2. Implement the new National Policy Statement for electricity networks.
- 1.3. Issue clearer guidance to Ofgem, network companies and developers on where new power lines should be located.
- 1.4. Develop an offshore ring main linking offshore wind farms.
- 1.5. Introduce local referendums for onshore wind and solar and shale projects, with energy bill compensation for local residents.
- 1.6. Promote renewable energy projects and power lines to be built alongside motorways.
- 1.7. National Grid ESO should commission a report on options to manage intermittency.
- 1.8. BEIS and Ofgem should roll out pilots of local electricity pricing.
- 1.9. Promote floating wind on Britain’s west coast.
- 1.10. UK and Irish Governments should cooperate on projects in the Irish Sea and Celtic Sea.
- 1.11. Stop paying wind farms when they are switched off due to excess generation in a region.
- 1.12. National Grid ESO stop developers hoarding grid access.
- 1.13. Grid capacity should not be allocated on a purely first-come, first-served basis,.

2. Cutting energy demand

- 2.1. Amend the Gas Safe scheme to include requirements on boiler efficiency.
- 2.2. Update Boiler Plus regulations to boost the efficiency of gas boilers.
- 2.3. Review certification schemes and the redress available to consumers who experience problems.
- 2.4. Extend Citizens Advice’s advocacy duty to include energy efficiency, heat pumps and demand flexibility.
- 2.5. Introduce a mix of incentives and regulations to boost the uptake of smart meters.
- 2.6. Review the warranties for smart meter equipment to ensure that they are fit for purpose.
- 2.7. Establish a National Energy Advice Service for England.
- 2.8. Enable the UK Infrastructure Bank to offer medium-term loans to households to pay for green measures.
- 2.9. Make the Future Homes Standard as stringent as possible by reviewing the use of transitional arrangements.

3. Cutting bills by making electricity demand more flexible

- 3.1. Bring forward the date for new pricing rules for energy suppliers by twelve months to October 2024.
- 3.2. Increase incentives for home energy storage and flexible demand.
- 3.3. Consider regulations to require all white goods to be 'smart' as standard (e.g. washing machines, dishwashers).
- 3.4. Require all new domestic EV chargepoint installations to have vehicle-to-home (V2H) technology by 2025.
- 3.5. Review and amend the Future Homes Standard to require smart technologies.

4. The Future of the Energy Price Guarantee

- 4.1. Replace the Energy Price Guarantee with a favourable tariff for a given number of units of energy for each household.
- 4.2. Create an expanded discretionary hardship fund administered by local authorities.
- 4.3. Energy suppliers should be required to offer more long-term, fixed-price energy deals.
- 4.4. Implement banking-style capital requirements for energy suppliers.
- 4.5. Link existing financial support schemes with existing energy efficiency schemes.
- 4.6. Permanently transfer green levies to general taxation.

5. Create a new Secretary of State for Energy with a clear mandate

- 5.1. Split BEIS into a Department for Energy and a Department for Business.

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Create a new Secretary of State
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Introduction

Net Zero offers a huge opportunity to the UK in a post-Brexit world.

Putin's invasion of Ukraine has demonstrated the crucial importance of energy sovereignty. So, Net Zero can offer a significant contribution to UK energy security, because it means generating more of our own energy from domestic sources, which are not reliant on global oil and gas markets or hostile regimes. Net Zero is also an inevitable direction for the planet as we seek to limit climate change in line with our international commitments, as well as to protect and conserve valuable resources and habitats.

The growth of new green industries in the UK, with the potential for global exports of technology and know-how, together with the need to phase out traditional fossil fuel use, offers great opportunities for green jobs and growth right across the UK. There is potential to revitalise UK manufacturing to support the growing supply chain in pursuing energy sovereignty.

As we make our way in the world outside the European Union, the UK's Official Development Assistance and our soft power will be employed in exporting know-how, skills, and technologies to the rest of the world as it decarbonises and works towards reducing its carbon footprint.

In the UK, the Government must focus on both energy supply and demand.

The inquiry heard from witnesses on barriers to deploying energy projects in the UK, which include the planning system and delays connecting to the electricity grid. We also heard from energy efficiency experts on how to speed up the installation of energy efficiency measures, and the importance of ensuring that heating systems such as gas boilers and heat pumps operate at their greatest efficiency.

Witnesses told us that cutting energy demand is a key way for customers to reduce their energy bills. Another way is through increased use of smart meters where customers can get paid for restricting their energy use to a 'cheap' time of day. The potential for 'demand flexibility' will increase as more people buy electric vehicles and install electrically powered heat pump systems.

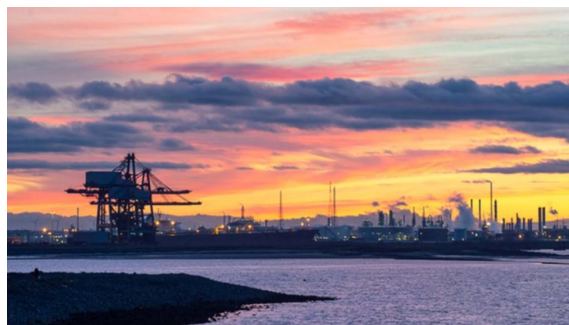
We also heard about the importance of the retail energy market itself in delivering affordable and stable household energy bills. A prerequisite for fixing the UK's broken retail energy market is to reform the Energy Price Cap. The Energy Price Cap was well intentioned, but it is poorly focused and hugely expensive to the taxpayer.

The need for focused attention on the energy trilemma requires the establishment of a separate Department for Energy led by a Secretary of State with a clear mandate.

Changing the structure of BEIS is a significant step and is bound to cause some disruption and cost. The Committee is making this recommendation as a result of the significant evidence taken that vital decision making with regards to the energy priorities within the Department have stalled as a result of the enormous and unforeseen impact of COVID on departmental priorities.

A Conservative Government will always focus on incentivising and facilitating action by the private sector, together with regulating for high standards.

We recognise that stable policy and regulation are the cornerstone of a competitive energy market that works for customers and investors alike. That is why our proposals focus on modifying existing schemes and regulations. It is also why we are delighted to see the roll out of smart electricity tariffs, which offer customers the chance to save money by changing their behaviour or buying new smart products.



Recommendations

1. Unblocking renewables

In general, the UK has successfully deployed renewable energy projects. However, renewable energy projects now face increasing bottlenecks, including:

- Delays in the planning system;
- Delays to grid connections;
- Supply chain shortages; and
- A creaking electricity market design.

In addition, there is an increasing risk of skills shortages as the deployment of offshore wind in particular ramps up this decade.

Recommendations to speed up the deployment of offshore wind farms.

Recommendation 1.1. Implement the new National Policy Statement for renewables.

It currently takes 3–5 years for an offshore wind farm planning application to get through the Development Consent Order (DCO) process, which is too long. In addition, we heard concerns that there currently isn't the right guidance in the DCO process. To address this, the Government should implement the new National Policy Statement for renewables, as well as exploring other changes to the planning system.



“It currently takes three to five years for an offshore wind farm planning application to get through, which is delaying the UK’s decarbonisation ambition.”

“Since 2017, all offshore wind farms have been recommended for rejection by Planning Inspectors. In each case, the Secretary of State has had to overrule the inspector.”

Nathan Bennett, Head of Public Affairs, Renewable UK

The National Policy Statements were set in 2011. Since then, the UK’s ambition on renewables has ramped up significantly as costs have fallen. The Government says that the National Policy Statements need to be updated “to reflect current energy policy, and that we continue to have a planning policy framework which can deliver investment in the infrastructure needed for the transition to net zero.”⁶

The NPS for renewable energy (EN-3) is currently in draft form and has already been consulted on.⁷ Implementing the new policy statement would clarify the Government’s guidance on renewables, reducing the risk of successful judicial reviews.

Recommendations to speed up the deployment of electricity networks.

Recommendation 1.2. Implement the new National Policy Statement for electricity networks

⁶ BEIS (Sept 2021), [Planning for new energy infrastructure](#), p.8.

⁷ [Ibid.](#)

There are only seven years until 2030, by which time the Government hopes to have 50 gigawatts (GW) of offshore wind online, a fourfold increase from today.⁸ National Grid CEO's set out the challenge to the BBC recently, saying: "we will need to build about seven times as much infrastructure in the next seven or eight years than we built in the last 32".⁹ Analysis by FTI Consulting found similar results.¹⁰

Slow development of new electricity networks therefore risks significantly delaying the UK's offshore wind rollout. In the British Energy Security Strategy, the Government said it wanted to "reduce timelines for delivering strategic onshore transmission network infrastructure by around three years". This is a laudable ambition, but it needs to be backed up with action.

The NPS for electricity networks (EN-5) has already been consulted on, and should be implemented.¹¹ Since the draft NPS was published, the Government and Ofgem are now taking a more strategic approach to offshore electricity networks, for example through the Offshore Transmission Network Review and the Holistic Network Design (HND), which identifies the highest priority network upgrades.¹² The Government should consider putting the HND on a statutory footing, by including it within the NPS. This would send a clear steer to planning authorities that these are the highest priority critical infrastructure that should be assessed (and ideally approved) fast.

Recommendation 1.3. Issue clearer guidance to Ofgem, network companies and developers on where new power lines should be located.

Electricity infrastructure like pylons and power lines is understandably controversial in some rural communities.¹³ There is a balance to be struck between the national benefits that electricity infrastructure provides (e.g. cheaper and cleaner energy) and the local impacts (e.g. visual impact, disruption during construction). To reduce local impacts, many new network projects involve putting cables underground or under the sea.

⁸Analysis of BEIS (Oct 2022), [Renewable Energy Planning Database](#)

⁹Emma Gatten, *The Telegraph* (Nov 2022), [Net zero goals will require installation of hundreds of miles of cables and pylons](#)

¹⁰Ofgem (Oct 2022), [Locational Pricing Assessment, Workshop Slides](#), p.12

¹¹BEIS (Sept 2021), [Planning for new energy](#)

¹²Ofgem (Dec 2022), [Decision on accelerating onshore electricity transmission investment](#)

¹³SASES (2022), [Why is the Suffolk coast besieged by Suffolk energy proposals?](#)

National Grid Electricity Transmission told us that, while figures vary between projects, the lifetime cost of underground cable "...will be around 5x more than overhead lines and subsea cables will be around 5-6x more".¹⁴

The Committee believes that the most important thing the Government can do is to give clarity to Ofgem, network companies and project developers. Does the Government agree with the current approach taken by network companies, or does it want to see more infrastructure placed underground? What criteria does the Government want companies to use when proposing new infrastructure?

Recommendation 1.4. Develop an offshore ring main for offshore wind farms.

Even though offshore wind farms are usually far offshore, they can still have a major impact onshore. These impacts include new underground power cables and large new substations. In places like Suffolk this infrastructure is becoming increasingly controversial.¹⁵

One way to minimise onshore infrastructure is for offshore wind farm developers to share connections to the onshore grid. The Government and National Grid ESO have both said that they want developers to do this, and plans are underway for a form of offshore ring main.¹⁶ To ensure that onshore infrastructure is minimised, the Government should introduce a new requirement on offshore wind farm developers to minimise onshore infrastructure, including by making use of a new offshore ring main.

¹⁴NGET also told the Committee that: "overhead line technology is the most economical [...], underground cables reduce visual impacts and are generally used in Areas of Outstanding Natural Beauty (AONB) or National Parks and subsea links become more cost effective over longer distances."

Ensuring local support for renewables through local referendums.

Recommendation 1.5. Introduce local referendums for onshore wind and solar and shale projects, with bill compensation for local residents.

As described above, offshore wind will be the backbone of the UK's future electricity system. But onshore wind and solar also have a key role to play, both in terms of adding diversity and because they can be built more quickly. Because they are onshore, onshore wind and solar typically cause more disruption and adversely affect more people than projects offshore.

This Committee has previously argued that all proposed onshore wind farms, solar farms and shale gas extraction ('fracking') should be subject to local referendums to ensure public support.¹⁷ As an incentive for people to back these projects, we argued that local residents should receive free or subsidised energy bills for the duration of the project. We believe that this is the best way to balance the national interest to secure more energy supplies with the rights and interests of local residents.

While shale gas extraction now appears unlikely to gather the necessary support in Parliament, the Committee still believes that renewable energy projects should be subject to referendums. In these referendums, we propose that everyone living within four miles of a proposed renewable energy facility should be given a vote.

If a simple majority approves of the scheme, then it should be allowed to proceed subject to usual planning considerations. To compensate local residents, all households within one mile of the proposed scheme should receive a 100% discount on their energy bills, and all households within three miles should receive a 50% discount, and those living within four miles should receive a 25% discount for the lifetime of the project. By linking the payments to distance, this will encourage developers to avoid sites directly adjacent to communities, reducing disruption and visual damage.

¹⁷National Grid ESO (n.d.) [The Pathway to 2030 Holistic Network Design](#)

Recommendation 1.6. Promote renewable energy projects and power lines to be built alongside motorways.

To further improve siting of renewable energy projects, the Government should encourage developers to seek sites adjacent to motorways. The network companies should also develop new power lines alongside motorways wherever possible because new power lines and new renewable energy projects go hand-in-hand. The Government could implement this change by changing planning guidance, including through National Policy Statements.

Recommendations to manage the intermittency of wind power

Recommendation 1.7. National Grid ESO should commission a report on options to manage intermittency.

We all know that the wind doesn't always blow and the sun doesn't always shine. As renewables become a bigger share of the market, this "intermittency" problem will become a bigger issue, particularly when trying to get above 80-90% low-carbon generation.

"Intermittency is particularly a 'last 10% problem. We can already run an electricity system with lots of renewables, but there is more work to do to get 100% low carbon."

Jonny Gallagher, Public Affairs and Policy Senior Manager, National Grid ESO

Today, wind and solar are backed up with gas-fired power stations. These options include batteries, low-carbon hydrogen, gas with carbon capture, geothermal and more – the Committee’s second report explored the potential for deep geothermal and mine water as a source of low-carbon heating.¹⁸

As the electricity system operator, National Grid ESO is well-placed to analyse these options and to provide advice to Ministers.

Recommendation 1.8. BEIS and Ofgem should roll out pilots of local electricity pricing.

Intermittency can also be mitigated by changing the design of the UK’s electricity market. Today, there is a single national price for electricity across the whole of the UK. This keeps things simple but ignores the fact that supply and demand vary significantly across the market.

Alternative market designs include elements of local pricing (for generators and perhaps for customers too). With local pricing, prices would vary across the country, depending on local supply and demand. For example, on sunny days, electricity prices in Cornwall would be lower because there are lots of solar farms there. Similarly, on windy days, electricity prices in Scotland would be lower due to high output from Scottish wind farms.

One consequence of local pricing is that generators and customers would be encouraged to use more electricity when local supplies are high, and less when local supplies are low – this would reduce the impact of intermittency.

Existing examples of local pricing include:

- Local “flexibility markets” across the UK;¹⁹
- Active Network Management (ANM) schemes such as one on Orkney;²⁰
- Local wholesale pricing for generators in much of the United States, in New Zealand and other markets. The technical name for local pricing is “nodal pricing”.²¹

¹⁸Rt Hon. Dame Andrea Leadsom DBE MP (July 2022), [Deep geothermal and mine water as low carbon heating sources: Second 1922 BEIS Backbench Committee report](#)

¹⁹Energy Networks Association (n.d.) [Flexibility services](#)

²⁰Renews.Biz (October 2021), [Orkney flexibility pilot wraps up](#)

²¹Catapult Energy Systems (Oct 2021), [Locational energy pricing in the GB power market](#)

National Grid ESO has recently backed the introduction of local pricing in Great Britain.²² In addition, both Ofgem and BEIS are both currently analysing the case for local electricity pricing.^{23, 24} This Committee has previously backed the introduction of local electricity pricing and continues to support it.²⁵

Recommendation 1.9. Promote floating wind on Britain’s west coast.

Another way to reduce intermittency is to build offshore wind more evenly around the UK’s coastline. With so many wind farms concentrated off the east coast of England and Scotland, the output of different wind farms is highly correlated with each other. This makes the intermittency worse. If the UK had more wind farms off the west coast, then there would be more diversity in the output of the wind farms, thus reducing the intermittency of the UK wind fleet.

A study by Regen found that building more wind farms off the west coast would significantly reduce the occurrence of very low wind output and would reduce the maximum ramp rate (rate of change of wind output), thus saving money.²⁶ In addition, developing more offshore wind off the west coast will take pressure off the existing electricity network on the east coast, which is increasingly full and needs to be upgraded.

Building wind farms off the west coast of Britain is likely to require floating turbines due to deeper seas. Floating turbines are currently significantly more expensive than their traditional (‘fixed bottom’) equivalents; however, this gap is expected to reduce over time.

Recommendation 1.10. UK and Irish governments should cooperate on projects in the Irish Sea and Celtic Sea.

Building more wind off Britain’s west coast will require more cooperation with the Republic of Ireland to develop interconnectors and potential ‘energy islands’. This cooperation could be achieved through the North Seas

²²National Grid ESO (May, 2022), [New ESO report finds electricity market reform critical for delivery of future system that is affordable, clean and secure](#)

²³Ofgem (Oct 2022), [Locational Pricing Assessment](#)

²⁴BEIS (July 2022), [Review of electricity market arrangements](#)

²⁵1922 Backbench Committee on BEIS (April 2022), [Inquiry: How can government support consumers and businesses to reduce their energy bills over the short term?](#) p.8.

²⁶Regen (Oct 2022), [Go West! An analysis of the energy system benefits](#)

Energy Cooperation (NSEC), of which Ireland is part – the UK has just signed an MoU to cooperate with NSEC, which the UK left as a result of Brexit.²⁷

In addition to developing wind farms together, the governments of the UK and the Republic of Ireland must continue to cooperate on energy to improve their mutual energy security. The Republic of Ireland is currently wholly dependent on the UK for imports of both electricity and gas, and Northern Ireland in particular is dependent on the Republic of Ireland for its energy security.

Recommendation 1.11. Stop paying wind farms when they are switched off due to excess generation in a region.

Intermittency also causes problems when it is too windy. Today, wind farms are paid to turn off when it is too windy, and the costs are recovered from customer bills. National Grid ESO forecasts that the total cost of network constraints is likely to be in the region of one to three billion pounds per year over the next 20 years – these costs include turning on and off all types of generation, not just wind.²⁸ This is not a sustainable solution. The Government should stop paying wind farms to turn off, which will encourage companies to invest in storage solutions and new sources of demand in areas with lots of wind farms.



²⁷ BEIS (Dec 2022), [UK signs agreement on offshore renewable energy](#)

²⁸ National Grid ESO (Aug 2022), [Modelled Constraints Costs](#)

Recommendations to reduce the time to connect new energy projects to the electricity grid ('grid queues').

The current grid connection process was “originally focused on connecting a small number of fossil fuel plants every year.”

National Grid ESO²⁹

Recommendation 1.12. National Grid ESO should stop developers hoarding grid access.

The current grid connection process was designed for connecting a small number of fossil fuel generators each year, such as gas- and coal-fired power stations. However, in 2022, National Grid ESO received around 500 new connection requests, a circa 10-fold increase since 2018.³⁰ This increase in applications is being driven by a wave of new battery storage and renewable energy projects. On the plus side, this demonstrates significant investor appetite for building clean energy projects in the UK. However, the sheer volume of applications is grinding the current system to a halt.

In response, the ESO is planning to introduce major changes to the connections process, including an amnesty for existing projects that can't connect and introducing milestones for projects so that project developers can't hog capacity.^{31, 32} The Committee is supportive of this vital work.

²⁹ National Grid ESO (Dec 2022), [GB Connections Reform](#), p.3.

³⁰ [Ibid](#), p.11.

³¹ [Ibid](#)

³² National Grid ESO (Oct 2022) [TEC Amnesty](#)

Recommendation 1.13. Grid access should not be allocated on a purely first-come, first-served basis.

On the demand side, there are also lots of projects looking to connect, including large batteries, data centres and, in future, hydrogen electrolysers. This is leading to similar grid queues for customers looking to connect to the grid, including housing projects and electric vehicle charging hubs. For example, In West London, housing projects have faced delays due to data centres taking a lot of capacity.³³

Currently, Distribution Network Operators (DNOs) cannot discriminate between different types of projects, which means that valuable housing projects could be delayed by battery storage projects, data centres or hydrogen electrolysers. The Committee believes that Ofgem and BEIS should work together to allow prioritisation of certain types of projects such as housing.

2. Cutting energy demand

The flipside to boosting energy supply is cutting energy demand. Every unit of energy that isn't used is a unit that doesn't have to be generated - this cuts costs, cuts gas imports, and cuts carbon emissions.

Energy saving is also one of the quickest ways to reduce the impact of the energy crisis. That is why the Committee recommended energy-saving advice in its first report in April 2022.³⁴ The Committee is pleased that the Government has launched a national energy-saving campaign, which has the potential to cut a typical annual household energy bill by over £200.³⁵

But there is still more to do to cut energy demand. During this inquiry, the Committee heard from witnesses on the need to improve boiler efficiencies and consumer protections, to complete the rollout of smart meters, and to improve the energy efficiency of new and existing homes through higher standards.

³³George Hammond, *Financial Times* (July 2022), [Housing development in England under threat as electricity capacity nears limit](#)

³⁴1922 Backbench Committee on BEIS (April 2022), [Inquiry: How can government support consumers and businesses to reduce their energy bills over the short term?](#), p.3.

³⁵BEIS and the Rt Hon. Grant Shapps MP (Dec 2022), [Small changes mean energy advice campaign adds up to big savings](#)

Improving boiler efficiencies

Recommendation 2.1. Amend the Gas Safe scheme to also include requirements on boiler efficiency.

Since 2005, all boilers fitted in the UK must be "condensing boilers". The advantage of condensing boilers is that they can operate at higher efficiencies compared to non-condensing boilers. However, these higher efficiencies will only be achieved if boilers are designed, installed and controlled properly. In practice, many UK gas boilers do not operate in condensing mode, and therefore do not operate as efficiently as they could do.



“As we transition to renewable heating systems there is a temptation to view condensing gas boilers as a discontinued technology and not remedy the near-universal underperformance against their A-rated label efficiency. Like it or not, gas will continue to heat many of our homes for another 15 years at least and it is not too late to get better at fitting them, in fact it is vital that we do.”

“Regulatory and market reform to weight heating system design equally with that of gas safety and make it easier for consumers to make good buying decisions can reduce gas use by 10–20% and offers quick wins for decarbonising homes and shielding households from fluctuating energy prices.”

Jo Alsop, Founder, The Heating Hub

One way to improve the efficiency of gas boilers is to implement and enforce higher standards. This could be done by introducing efficiency standards for boiler installations as part of the Gas Safe register, which currently only focuses on safety.³⁶ This should include tackling the installation of oversized boilers, which leads to more cycling and lower efficiency, optimising boilers to the home and hydronic balancing. The objective should be for safety and efficiency to go hand in hand. Installers must undergo competency checks every 5 years, so this could be rolled out quickly and the issue of inefficient boiler installations solved within that time period or more quickly.

Recommendation 2.2. Update the Boiler Plus regulations to boost the efficiency of gas boilers.

Higher installation standards need to be accompanied by more stringent regulations. Since 2018, Boiler Plus regulations have required new gas boilers in England to be installed with additional energy efficiency measures, including weather compensation and smart controls. In theory, these energy efficiency measures should help to reduce energy bills. However, some of the measures are more valuable than others.

For example, weather compensation helps improve the efficiency of gas boilers by ‘modulating’ the temperature at which it operates based on the outside temperature. When it is warmer outside, the boiler flow temperature is automatically reduced as the property needs less heat – this allows the boiler to condense more often, increasing efficiency and cutting bills.

The Committee heard from witnesses that the Boiler Plus regulations should be updated to drive up efficiency.

These updates should include:

- Covering properties with hot water tanks (not just combination boilers);
- Requiring modulating controls (i.e. weather or load compensation);
- Require boilers to be compatible with an open-source control language such as OpenTherm – this approach is prevalent in the Netherlands;
- Regulating the maximum power output of boilers so that it is appropriate for the property.

³⁶ Gas Safe Register (n.d.) [The home boiler guide](#)

The Government is currently consulting on improving boiler standards and efficiencies.³⁷ The Committee recommends that the Government mandates the measures listed above.

Improving consumer protections

Recommendation 2.3. Review certification schemes and the redress available to consumers who experience problems.

Customers who install heat pumps, solar panels, energy efficiency measures and gas boilers need to know that their installer is competent and that, should something go wrong, they have options to seek redress.

The Committee heard from witnesses that current accreditation schemes are complicated, and that customer protections could be improved, including by enhancing the powers of the Energy Ombudsman and potentially by consolidating existing accreditation schemes into fewer but higher quality schemes.

Therefore, the Government should consider the following:

Improve customer protections under MCS Certification

– MCS is a standards organisation for products such as solar panels, heat pumps and home battery storage.³⁸

The Committee heard from witnesses that some customers have had problems seeking redress under MCS Certification because their installation was not certified once completed. We therefore recommend that any installations completed by an MCS-certified installer should be eligible for recourse if not up to standard – regardless of whether an MCS certificate is issued for that installation. This needs to be fixed quickly in time for the ramping-up of heat pumps (many of which are installed under MCS).

Accreditation could also be split into two levels for heat-pumps – one for system design and one for installation. This would help to resolve issues where installers also design the system despite not being best placed to do so, resulting in inefficient setups. This would recognise that designing heat pump systems is a skilled task distinct from installing heat pump systems.

³⁷BEIS (Dec 2022), [Improving boiler standards and efficiency](#)

³⁸MCS (n.d.) [About Us](#)

Review the Trustmark scheme to ensure standards but reduce complexity for new providers to become accredited and strike the right balance between standards and accessibility – Trustmark is a Government-backed scheme for tradespeople, including those undertaking retrofit/energy efficiency measures.³⁹

We heard concern from witnesses that the Trustmark standards and administration requirements present too high a bar for smaller installers. Therefore, the Government could review Trustmark and other certification schemes to ensure that they strike the right balance between standards, accessibility and customer protection.

Expand the remit of the Energy Ombudsman to make a 'one-stop shop' for energy complaints

– The Energy Ombudsman handles disputes between consumers and energy suppliers, plus other schemes such as the Green Deal.⁴⁰ The Committee heard concerns from witnesses that the energy complaints process for consumers is confusing, with not all issues covered by the Energy Ombudsman.

To improve customers' rights, the Government should consider making the Energy Ombudsman a 'one-stop shop' for energy complaints. This could include using the Energy Ombudsman to oversee and enforce an overarching insurance policy for all installations under MCS, Trustmark and other certification schemes. This could be something everyone pays into to ensure there is a pot available to rectify any issues with installations.

Recommendation 2.4. Extend Citizens Advice's advocacy duty to include energy efficiency, heat pumps and demand flexibility.

Today, Citizens Advice has a statutory advocacy duty on retail energy supply (energy suppliers). In this role, Citizens Advice spotted many of the problems with energy suppliers before they went bankrupt over the last couple of years.⁴¹ The Energy Bill currently going through Parliament includes a provision to extend Citizens Advice's advocacy duty to cover heat networks.⁴² The Government should consider extending this advocacy duty further to cover energy efficiency, heat pumps and demand flexibility.

³⁹Trustmark (n.d.) [About Us](#)

⁴⁰Usave (July 2021), [What is the Energy Ombudsman?](#)

⁴¹Citizens Advice (n.d.) [Check who's taken over your energy supply](#)

⁴²Parliament.UK, [Energy Bill \[HL\]](#) ("as introduced" version) (Session



Completing the rollout of smart meters.

Smart meters are a powerful tool for customers looking to cut their energy bills either by reducing overall consumption or by shifting their electricity demand to off-peak periods when electricity can be cheaper. As smart meters automatically send readings to energy suppliers, they are easier for customers and reduce the risk of erroneous readings.

Recommendation 2.5. Introduce a mixture of incentives and regulations to boost the uptake of smart meters.

Despite the benefits of smart meters, only around half of homes in England have had an electricity smart meter installed. The figures are lowest for private-rented accommodation.⁴³ Given the scale of energy crisis, the Government should therefore prioritise measures to boost the installation of smart meters, including a mixture of incentives and regulations.

Incentives and regulations should include:

Cheaper energy prices for customers who install smart meters. Customers with smart meters are cheaper for suppliers to serve. This is because readings are taken automatically, reducing labour costs (for visiting premises to read meters) and reducing the incidence of incorrect and/or fraudulent meter readings. To reflect these cheaper costs, Ofgem should amend the price cap to allow energy suppliers to charge a lower rate to those with smart meters and a higher rate for those without. This is not intended to unduly punish those who don't want smart meters, but merely to reflect the underlying costs.

⁴³BEIS (Nov 2022), [Smart meter statistics](#)

A public messaging campaign for smart meters. There should be a public messaging and street-by-street installation campaign for Smart Meters, led by suppliers and local authorities working in tandem. The messaging would be along the lines of "we'll be installing smart meters in your area on these dates, please make yourself available". The Government could also consider providing a financial bonus for those who install a smart meter as part of this campaign.

Requiring smart meters for all new tenancies from April 2025. The private-rented sector has a particularly low uptake of smart meters, compared to social-rented and owner-occupied homes. As energy bills are typically paid by tenants rather than landlords, there is a case for the Government to regulate to require landlords to install smart meters. The Government is already consulting on requiring all new tenancies to be EPC C (an energy efficiency metric) from April 2025.⁴⁴ The requirement should be expanded to also require a smart meter to be installed for all new tenancies from the same date.

Requiring smart meters to be installed for all house sales. House sales could also be a trigger point for the installation of smart meters. The Government could therefore consider making smart meters a requirement for all house sales, unless the seller can demonstrate that installation is not possible.

Recommendation 2.6. Review the warranties for smart meter equipment to ensure they are fit for purpose.

Smart meters are of course not perfect. For example, the Committee is aware of issues with smart meter in-home displays' having just a one-year warranty period, which is very low for a simple piece of consumer electronics that should not go wrong.⁴⁵ The Government should review this issue to ensure that customers are being provided with high quality and reliable equipment alongside their smart meters.

⁴⁴BEIS (Dec 2020), [Improving the energy performance of privately rented homes](#)

⁴⁵Energy in Buildings and Industry (n.d.), [So what happens when your screen goes blank?](#)

Improving the energy efficiency of new and existing homes:

Recommendation 2.7. Establish a National Energy Advice Service for England.

In Scotland, government-funded energy-saving advice is delivered by Home Energy Scotland, which is managed by the Energy Saving Trust (EST).⁴⁶ Home Energy Scotland offers advice on a range of energy issues including energy saving, available loans and grants for home upgrade, installing renewable energy and more. The UK Government should establish a similar scheme in England.

Recommendation 2.8. Enable the UK Infrastructure Bank to provide medium-term loans to households to help pay for green measures.

The upfront cost of energy efficiency measures is a major barrier for many households. Government grant schemes are welcome, but can only go so far. A more sustainable solution is finance (e.g. loans), which allows households to pay off the upfront cost of installing measures over time, with the repayments funded largely or wholly from energy bill savings. In the Committee's first report, we recommended that the Government consider establishing a medium-term non-subsidised loan scheme for households and business that would allow them to take up new energy efficiency measures without a large initial outlay – this funding could be delivered through the UK Infrastructure Bank.

Recommendation 2.9. Make the Future Homes Standard as stringent as possible by reviewing the use of transitional arrangements.

The Future Homes Standard is a planned change to building regulations which means that, from 2025, all new homes should have significantly lower energy emissions, for example through better insulation and installation of heat pumps or heat networks rather than gas boilers. Some witnesses were concerned that some developments built after 2025 would be able to be built

⁴⁶Energy Saving Trust (March 2022), [Business Energy Scotland service will support SMEs on path to net zero from April 2022](#)

to the existing standards which are lower – this occurs due to transitional arrangements in place for sites commenced before the regulations come into force. The Government should therefore review any transitional arrangements planned as part of the Future Homes Standard to ensure that as many homes as possible are built to the highest standards of energy efficiency.

3. Cutting bills by making electricity demand more flexible

Cutting energy demand is not the only way to reduce bills. Underlying (wholesale) electricity prices vary at different times of day and year depending on supply and demand. Typically, households have been shielded from this volatility by their energy suppliers by paying a fixed price for electricity regardless of when they use it.

Innovations such as smart meters make it possible for energy suppliers to offer 'smart tariffs' that have lower price periods at different times of day. For example, a driver with an electric vehicle could be offered a low rate to charge overnight, when wholesale electricity prices are typically lower due to low demand.

The Government should go further to harness the power of flexibility to reduce bills, following the recommendations below.

Recommendation 3.1. Bring forward the date for new pricing rules for energy suppliers by twelve months to October 2024.

Energy suppliers will only offer customers smart tariffs if they have the right incentives to do so. Today, suppliers are charged for most customers based on an average electricity demand profile, even if they have a smart meter that can measure their real-time demand. This reduces the incentives for smart tariffs and demand flexibility.

To address this, Ofgem is planning new pricing rules for energy suppliers (known as half-hourly settlement) from October 2025.⁴⁷ To increase incentives for flexibility, the Government and Ofgem should bring forward this date by twelve months to October 2024.

⁴⁷New Power (April 2022), [Ofgem: Half-hourly settlement to be mandatory from October 2025](#)

Recommendation 3.2. Increase incentives for home energy storage and flexible demand .

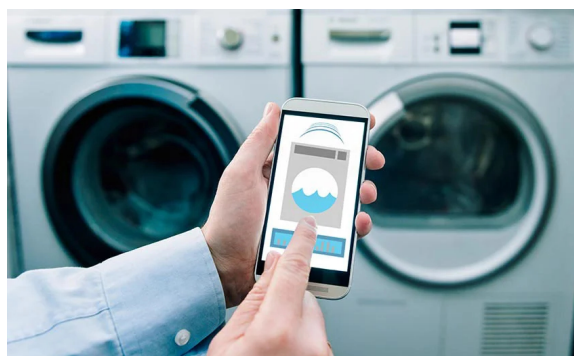
During the current crisis, National Grid ESO is trialling the potential of households to reduce electricity demand at peak periods through its Demand Flexibility Service (DFS).⁴⁸ To date, the trial has been successful, with customers demonstrating their desire to shift their electricity demand in return for energy bill savings. To increase demand flexibility, the Government, Ofgem and National Grid ESO should work together to increase incentives. This could include rolling out DFS as a business-as-usual activity, trialling local electricity pricing, and expanding the use of local flexibility markets.

Recommendation 3.3. Consider regulations to require new white goods to be 'smart' as standard (e.g. washing machines, dishwashers).

We heard from Witnesses that demand flexibility is only likely to become widespread if it can be automated. For example, the charging of an electric car could be controlled by an energy supplier to be concentrated during periods of low prices. Various trials have demonstrated that this can be effective. This type of automated demand flexibility requires goods to have smart capabilities.

Witnesses mentioned the availability of devices that can make existing non-smart devices smarter, for example smart plugs and smart button pushers.⁴⁹ While these are potentially useful, they are clearly no substitute for making devices include smart functionality from the start.

The Government has already required smart capabilities for all new electric vehicle chargepoints installed in homes.⁵⁰ It should look to expand this approach to include all white goods such as washing machines and dishwashers.



"Last year, EDF ran a trial project on electric car charging. At the start of the project, we surveyed people asking them how comfortable they would be with their energy company controlling the charging of their car. At the start, around 52% of people said that they were uncomfortable, but by the end of the project this had reduced to 22%."

Rebecca Rosling, Head of Smart Customers, EDF

Recommendation 3.4. Require all new domestic EV chargepoint installations to have vehicle-to-home (V2H) technology by 2025.

Electric vehicles have the ability both to charge and discharge their batteries from the electricity grid. Battery discharging to the grid is sometimes known as either Vehicle-to-Grid (V2G) or Vehicle-to-Home (V2H) technology.

⁴⁸ National Grid ESO (Nov 2022), [Demand Flexibility Service](#)

⁴⁹ UK SwitchBot

⁵⁰ Office for Product Safety and Standards, BEIS and Office for Low Emission Vehicles (Feb 2022), [Regulations: electric vehicle smart charge points](#)

Most EV charge points installed today do not support V2H technology, in part because it is more expensive. As the costs of this new technology comes down, the Government should require all new charge points to have V2H technology - this will give customers more potential to earn money by discharging their car batteries to the grid at peak times should they want to.

Recommendation 3.5. Review and amend the Future Homes Standard to require smart technologies.

As described above, the Future Homes Standards focuses on reducing energy demand and carbon emissions through insulation and low-carbon heating systems. However, as this section shows, demand flexibility is also a crucial part of the transition to net zero. Therefore, the Government should review and amend the Future Homes Standard to include requirements on smart technologies such as smart meters, smart EV chargepoints, smart white goods and more.

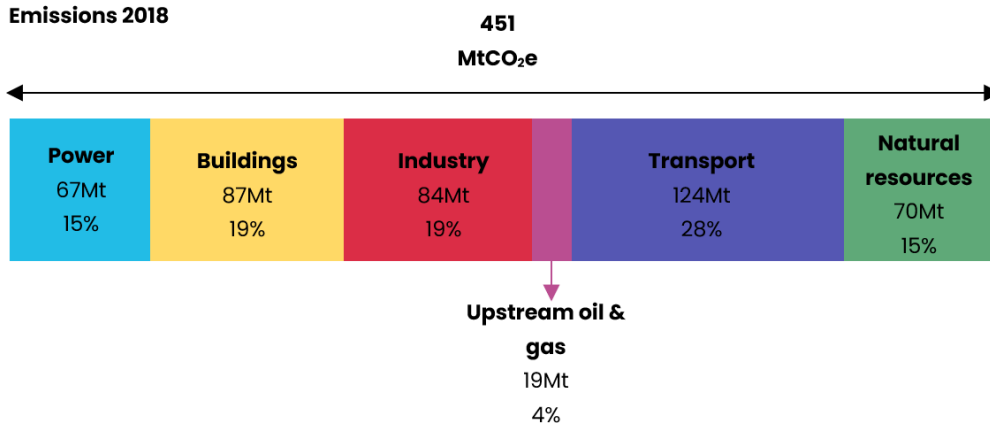
Note on future heating systems:

The UK has made great progress reducing emissions in its electricity (“power”) sector – see figure below. However, there is still substantial progress to be made in other areas, including buildings and transport.

One option proposed to reduce emissions in buildings is replacing gas boilers with hydrogen boilers. The advantage of this approach is that the end-user experience would be similar to today’s gas boiler. Disadvantages include the fact that hydrogen boilers will be substantially less efficient than electric heat pumps. One analysis finds that using green hydrogen (from electricity) for home heating would require six times more renewables than using electric heat pumps.⁵¹ In addition, there will be multiple demands for low-carbon hydrogen, including decarbonising long-distance transport and for industrial applications.

When deciding on which technologies to promote for home heating, the Government will need to carefully weigh all of these factors.

Figure 1 – UK Territorial Emissions 2018⁵²



⁵¹ According to evidence given to the [House of Commons Science and Technology Select Committee](#) (March 2021)
⁵² HM Government (Dec 2020), [Energy White Paper: Powering our Net Zero](#)

4. The Future of the Energy Price Guarantee

The Energy Price Cap was a well-intentioned policy that was intended to stop customers being ripped off by their energy supplier if they did not switch often enough. However, the current crisis has exposed major flaws in the operation of the cap. Because the cap is below the true cost of supplying energy, almost all customers are now on capped tariffs, killing the market for switching between energy suppliers and exacerbating the bankruptcies of energy suppliers.

The Energy Price Guarantee (EPG) is a Government subsidy to reduce the level of the Energy Price Cap. The EPG is very poorly targeted, costing the taxpayer tens of billions of pounds. Therefore, the Government needs to urgently remove the Energy Price Guarantee and replace it with a more targeted system.

The energy regulator Ofgem must also shoulder much of the blame for supplier failures. Financial regulation of energy suppliers was far too weak, and the Government must now direct Ofgem to implement banking-style financial stability requirements on energy suppliers.

Finally, during the current crisis the Government has moved the cost of green energy schemes (green energy levies) to general taxation. This not only lowers energy bills but also makes heat pumps more attractive (because green levies are disproportionately applied to electricity rather than gas).

Recommendation 4.1. Replace the Energy Price Guarantee with a favourable tariff for a given number of units of energy for each household.

Any alternative to the Energy Price Guarantee needs to be free market. We heard from witnesses that, because the EPG subsidises the cost of all energy consumed, it provides more support to richer households (who typically use more energy) and reduces incentives for energy saving (increasing the risk of blackouts).

A viable alternative would be to offer each household a subsidised price for a given number of energy units. Consumption above the limit would be charged at the full market price. This strikes the right balance between protecting poor households and maintaining incentives to save energy, especially for richer households who have greater financial means to invest in energy-saving technologies.

Recommendation 4.2. Create an expanded discretionary hardship fund, administered by local authorities.

No Government support scheme can perfectly target households in need. Therefore, the Government should introduce an expanded discretionary hardship fund that can be distributed by local authorities – building on the existing Household Support Fund that was introduced during the pandemic. The fund should be better able to target households in the most severe need, compared to existing relatively blunt schemes such as Universal Credit or Pension Credit.

The Committee recommends that Citizens Advice should be contracted to help with financial assessment of those in hardship, and that financial support should be targeted towards the elderly and families with children below the age of eight.

Recommendation 4.3. Energy suppliers should be required to offer more long-term, fixed-price energy deals.

For some customers, the current energy crisis doesn't exist – these customers are still on multi-year fixed-price energy contracts signed before the current crisis. However, during the current crisis, the market for fixed-price contracts has all but collapsed, in part due to the design of the Energy Price Cap.

As with mortgages, long-term energy contracts have a role to play in keeping energy bills stable, and this is something that the Government should look to promote. The Government should therefore require all energy suppliers to offer fixed-price contracts over a range of durations (e.g. one, two, and five years).

Recommendation 4.4. Implement banking-style capital requirements for energy suppliers.

Ofgem has serious questions to answer over its role in recent bankruptcies of energy suppliers. The financial regulations on energy suppliers were clearly inadequate, leading to a financial crisis for energy suppliers that has clear parallels with the 2008 Financial Crisis in the banking sector.

To avoid a repeat of current failures and the costs that come with them, the Government should direct Ofgem to implement banking-style capital requirements for energy suppliers. Other regulators have relevant experience doing this, so Ofgem should work with the Prudential Regulatory Authority (PRA) to develop an appropriate regime.

Recommendation 4.5. Link existing financial support schemes with existing energy efficiency schemes.

Today, there is a disconnect between the Government's financial support schemes and its energy efficiency schemes. This is a missed opportunity, because energy efficiency measures can cut bills and therefore reduce financial hardship (and therefore the level of support that households require from the Government).

To address this, the Government should link financial support schemes with energy efficiency schemes under a single umbrella – this should be called ECO++, building on the successful ECO energy efficiency scheme.

ECO++ should offer selected households a free, holistic assessment of their property's energy efficiency – the selected households should include those who are more vulnerable or in poor quality housing, with a paid-for options available to other households. This information could be used both to assess the level of financial support needed and to implement energy efficiency measures to reduce financial hardship.

Recommendation 4.6. Permanently transfer green energy levies to general taxation

Green energy levies are charges, predominantly levied on electricity bills, to pay subsidies to renewable energy projects such as wind and solar farms. Under the Energy Act 2008, the cost of subsidies such as Renewables Obligation are paid for by energy suppliers, leading to higher customer bills.⁵³ The advantage of this arrangement, from a government point of view, is that it puts the liability on customers rather than the Treasury. However, the downside is that this approach is regressive. It also risks accusations that the Government is concealing the cost of green technologies, which could harm support for Net Zero.

The use of green levies to fund renewables schemes ramped up significantly during the Coalition Government with many projects built under the Renewables Obligation scheme and the introduction of the Contracts for Difference scheme.

To address the cost of green energy levies, the Government should permanently transfer them to general taxation, extending the approach introduced by Liz Truss as Prime Minister.

⁵³ Ofgem (n.d.) [Renewables Obligation](#)

⁵⁴ HM Treasury (Nov 2017), [Control for Low Carbon Levies](#)

This would be expensive, costing an estimated £10 billion per year according to a 2017 forecast by HM Treasury.⁵⁴ But it would also be more transparent, more progressive, and more honest about the cost of Net Zero. A further advantage of moving green energy levies to general taxation is that it would reduce the cost of electricity relative to the cost of gas. This would make electricity-driven heating systems such as heat pumps more attractive.

5. Create a new Secretary of State for Energy with a clear mandate.

The need for focused attention on the energy trilemma requires the establishment of a separate Department for Energy led by a Secretary of State with a clear mandate.

Recommendation 5.1. Split BEIS into a Department for Energy and a Department for Business.

Urgent Government action on promoting domestic energy generation and on facilitating energy demand reduction requires significant leadership focus on the entire energy brief. It should be separated out from the rest of BEIS, with its own Secretary of State and with a clear mandate to resolve the UK's energy trilemma. Changing the structure of BEIS is a significant step and is bound to cause some disruption and cost.

The Committee is making this recommendation as a result of the significant evidence taken that vital decision making with regards to the energy priorities within the Department have stalled as a result of the enormous and unforeseen impact of COVID on departmental priorities.

The new Department should have three junior Ministers, each responsible for one strand of the energy trilemma (security, affordability, decarbonisation). This will ensure that all three legs of the energy trilemma are given equal focus and that the balance between them is retained.

The current energy crisis has demonstrated how closely interlinked the three parts of the trilemma are: loss of Russian supply harmed European energy security, creating higher gas prices and has led EU countries in particular to burn more coal in the short term.

The Minister for Energy Security could be the Lords Minister and the two other Ministers – one for Affordability and one for Decarbonisation – could be Commons Ministers, with the Minister for Decarbonisation holding a joint role with DIT to retain a strong focus on building UK green export potential.

1922 Business, Energy and Industrial Strategy Backbench Committee

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