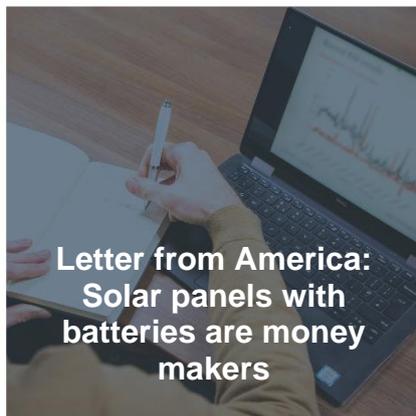


# Energy Spectrum: Capturing key developments across the GB energy sector

ISSUE 831 – 07 November 2022



# ISSUE 831

## Contents

4

### Energy Perspective

Hydrogen: projecting the cost impact on domestic heating

---

7

### Policy

Energy Systems Catapult reports on carbon accounting  
Royal Society explores the prospects of geological carbon storage  
Parliamentary update: week 44

---

12

### Regulation

Scheme documents for the Energy Price Guarantee and Energy Bill Relief Scheme issued

---

16

### Industry Structure

BEIS publishes Q322 Renewable Energy Planning Database  
Understanding energy market change: our research output

---

21

### Europe

IEA calls on governments across EU to reduce gas consumption

---

23

### Nutwood

Letter from America: Solar panels with batteries are money makers

---

25

### Markets

# ISSUE 831

## Week in review

We will be running a short webinar on 8 November at 9am for *Energy Spectrum* subscribers, to briefly go through some of the main stories in this issue. We will also look forward to what will be in the next issue.

Please register for our webinar [HERE](#)



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**Monday 31/10** – Ofgem publishes its quarterly report for activity under the Green Gas Support Scheme (GGSS).

**Tuesday 01/11** – The UK Government publishes rules, guidance, and scheme documents relating to the Energy Bill Relief Scheme.

**Wednesday 02/11** – Ofgem reports the number of Renewable Obligation Certificates (Rocs) presented to it by suppliers over 2021-22 totalled 109,312,159, which amounts to 85.5% of the total obligation.

**Thursday 03/11** – The Environmental Audit Committee announces that it has opened a new inquiry examining the role that onshore solar energy technologies can play in the UK's journey to net zero.

**Friday 04/11** – The UK Government publishes the *COP26 Presidency outcomes* document detailing commitments and actions made following the Glasgow summit and the UK's COP Presidency year.



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The path to decarbonising heating (space heating, hot water and cooking) in homes and businesses remains unclear, with possible options including electrification using heat pumps, deployment of heat networks, or conversion of gas infrastructure to hydrogen and widespread adoption of hydrogen for heating. We will assess these options in this week's *Energy Perspective*.

The government has committed to making a decision on heat decarbonisation policy by 2026, leaving a policy gap of over three years. A range of sectors are exploring the use of hydrogen to decarbonise the UK's energy system, including for domestic heating.

Beginning with applications in transportation and industry, a market may develop with the potential to play a role in industrial decarbonisation and hard-to-abate users in high carbon emitting industries. To support the development of the hydrogen economy, the government has set a target of 10GW of hydrogen production by 2030, with the expectation that this will increase significantly beyond 2030.

From a behavioural perspective, testing is underway to assess how easy consumers find switching to using hydrogen from natural gas (methane). Domestic hydrogen-mix

ready boilers are currently available, with the potential to adapt the existing natural gas infrastructure to transport hydrogen into homes, but what about the cost of fuel?

Although hydrogen is the most abundant element in the universe, there is little naturally occurring hydrogen on Earth and nearly all hydrogen we use has to be manufactured. There are four main sources of commercial hydrogen production (natural gas, oil, coal and electrolysis), although only reformation of natural gas with carbon capture and storage and electrolysis of water are seen as viable in a net zero economy.

The process of Steam Methane Reformation (SMR) combines natural gas with steam, resulting in the output of hydrogen and carbon dioxide as a by-product. Through an additional process of carbon capture and storage (CCS), hydrogen could be produced with minimal release of carbon into the atmosphere.

The output of SMR with CCS is widely known as 'blue hydrogen'. The production of hydrogen through the electrolysis of water, where the source of electricity is renewable (wind, solar, geothermal, hydro), is known as 'green hydrogen'.

Both blue and green hydrogen production offer pathways to net zero, but – given that both carbon capture and electrolysis are emerging technologies – it is not yet clear which will prove cost efficient in the long run to achieve net zero.

There are other new technologies which may offer more economically efficient solutions in the future. One such emerging technology is pyrolysis, where hydrogen would be produced with carbon by-products, rather than carbon dioxide.

In a recently published [report](#) we laid out production cost projections for both blue and green hydrogen to 2050 with a view to forecasting when costings between the two production methods would converge if any, and what this means for domestic space heating costs compared to current gas heating.

**Figure 1: Hydrogen scenarios potentially compatible with net zero**

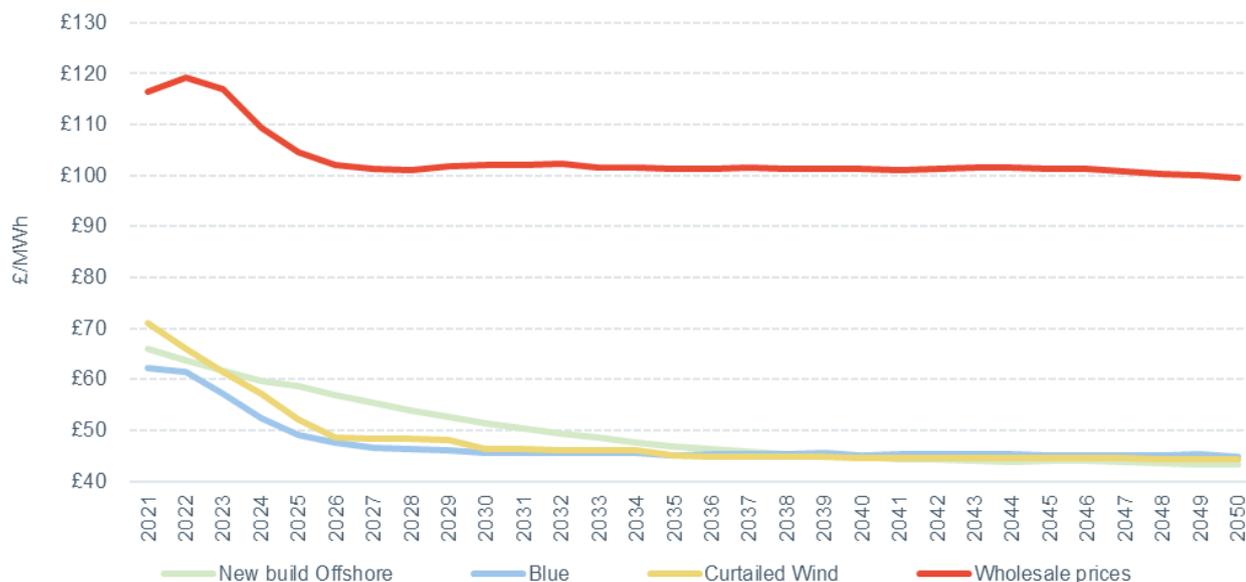
Scenario	Origin
New build offshore wind (Green)	Dedicated new build offshore wind
Blue blend	Grid imports of natural gas combined with hydrogen
Green blend	Curtailed wind
Blue	SMR with carbon capture (uses natural gas)

Source: Cornwall Insight

## Forecast cost of hydrogen production

Our conclusions on the cost of hydrogen production are shown in Figure 2.

**Figure 2: Forecast levelised cost of hydrogen production (LCOH) in a range of scenarios**



Source: Cornwall Insight

Using wholesale electricity prices as feedstock to generate hydrogen would be a particularly expensive solution (shown as 'Wholesale prices' in the chart). Due to the way GB electricity markets operate, and the network and policy costs applied to import from the public networks, costs for hydrogen produced from electricity are forecast at around double the costs of hydrogen produced via other scenarios.

With any cost projection the devil is in the detail and the inputs used. We carried out modelling into hydrogen production using BEIS' assumptions on the cost and efficiencies of production, along with our Benchmark Power Curve for wholesale gas, carbon prices, new build asset costs, and wholesale electricity prices. In places we used discounts and hurdle rates that are lower than those shared by BEIS, drawing on our own insights and other public sources.

For blue hydrogen production we assumed SMR technology was in use. For green hydrogen scenarios we assumed an alkaline plant was in use, combined with three different scenarios of electricity prices.

For hydrogen production using surplus wind, we assume, like BEIS, that the cost of the electricity is zero and the load factor of such an electrolyser is 25%. This scenario follows from recognising that the build out of offshore wind and other forms of generation capacity is set to continue and at times the volume of generation supply will exceed demand and rather than curtail this supply, the surplus is diverted to electrolyser plant and used to produce hydrogen.

Curtailed wind could also be made available due to local network constraints where generated volumes are unable to be transported to areas of demand. We note that the volumes of power available to produce hydrogen through this methodology are not forecast to be sufficient to provide sufficient quantities to have a significant impact on decarbonising GB domestic heating. Solely relying on surplus wind to source hydrogen will thus prove challenging.

Looking more closely at the results, there is some cause for optimism with prices for new build offshore, blue and curtailed wind eventually converging from the mid-2030s. If the roll out of renewable generation were to be accelerated, the cross over points between blue and green could even occur this decade.

### But what does this mean for domestic space heating costs?

We forecast that natural gas prices will be lower than hydrogen prices across the scenarios.

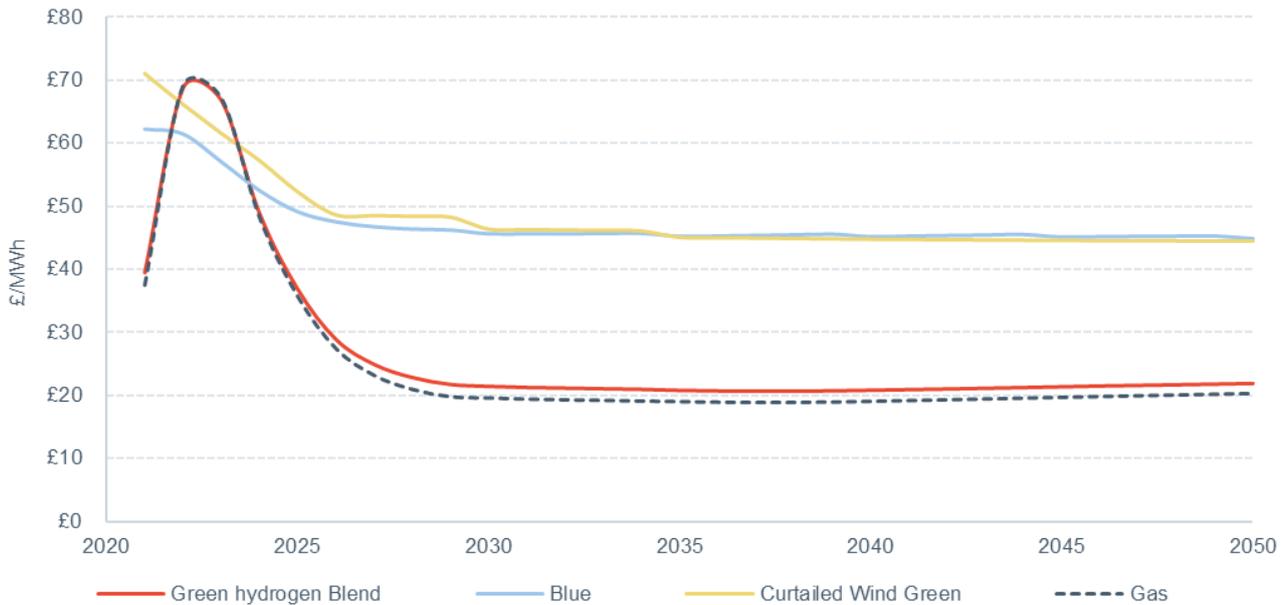
A series of trials are underway using a blend of up to 20% hydrogen with 80% natural gas in the public network supplying homes and businesses. An 80:20 blend by volume is equivalent to a 93% of energy being derived from natural gas and 7% from hydrogen. This is due to the lower energy density of hydrogen, which is

around a third of that of natural gas. The result of this is that blending to an 80:20 volume ratio seen in the trials is unlikely to materially change the commodity cost component of domestic gas retail tariffs. The lower cost of natural gas compared to hydrogen is shown in Figure 3.

The carbon emissions benefits of a blended approach are likewise muted, with reductions of only around 7% against the natural gas baseline.

The effects of the historically high wholesale gas prices last through the years to 2020-2025 (Figure 3). If natural gas prices were to remain high – as is increasingly forecast – the case for the transition to hydrogen could be revised.

**Figure 3: Forecast cost of hydrogen - comparison with natural gas**



Source: Cornwall Insight

Assuming that wholesale gas prices will start to “normalise” from 2025 onwards the impact of hydrogen as a domestic fuel on consumers, using Ofgem’s medium Typical Domestic Consumption Values of 12,000kWh per annum is shown in Figure 4. This shows the difference between using gas and hydrogen mixes, with no scenarios resulting in a reduction over time.

An increase in costs might be acceptable as part of the transition to a decarbonised society. Pathways to decarbonisation will mean difficult decisions must be made.

**Figure 4: Forecast average retail costs in five-year blocks using typical domestic consumption values (medium), p/kWh**

Scenario	£/year cost to household			
	2025	2030	2040	2050
New build offshore wind (Green)	£106.68	£340.66	£309.41	£425.27
Blue	£49.95	£316.37	£318.33	£434.94
Green blend	£7.47	£23.85	£21.66	£155.20
Blue blend	£3.50	£22.15	£22.28	£155.88

Source: Cornwall Insight

### MCS Charitable Foundation – Hydrogen Costs

MCS Charitable Foundation (“MCS”) in its charity goal of decarbonising homes, heat and energy commissioned us to independently calculate the costs of blue and green hydrogen, based on current and projected gas prices.

This report which we have discussed in this *Energy Perspective* sets out our methodology for this forecast, and our findings in terms of delivered prices for green and blue hydrogen.

Read the [full paper](#).

On **26 October**, Energy Systems Catapult announced the publication of **Carbon Accounting in Industry: Learning from the South Wales Industrial Cluster** in which it recommends policies that it states support a more consistent and coherent approach to the monitoring, reporting, and verification (MRV) and the accounting of greenhouse gas (GHG) emissions in industry.

The report highlights that carbon accounting is the process that is used to measure the levels of greenhouse gas (GHG) emissions emitted for the purposes of reporting for schemes or measuring a carbon footprint. It adds that so far there has not been the development of a consistent definition, protocol or approaches leading to a complex system.

It states that in 2021, industry made up 16% (72 MtCO<sub>2</sub>e) of total UK emissions and that reducing these is essential for the UK to reach net zero. The inconsistencies highlighted in the report with approaches to MRV mean that it is difficult to compare emissions reductions across industry sub-sectors, clusters, and regions. A consistent approach and a “carbon accounting framework for industry” is suggested in the report including an MRV process across industry which would be supported by expansion of the UK Emissions Trading Scheme (ETS) and carbon standards.

In addition, digitisation can play a role by simplifying reporting and verification processes as well as increasing transparency of emissions data. On the issue of regulatory oversight in the mechanisms it points to it promoting accounting principles and certifying third party verifiers. It also points to the UK ETS as anchor for development of complementary mechanisms to help enable collaboration and investment. Recommendations contained in the report for policy makers include:

- Commit to establishing a national carbon accounting framework for industry with Government providing steer to simplify and strengthen carbon accounting practices across industry. The UK Emissions Trading Scheme could act a starting point for this framework, targeting the MRV of emissions at the installation level with complementary mechanisms developed to consider supply chain emissions and opportunities for innovation as part of a whole systems approach to decarbonising industry and the wider economy.
- Fund industrial pathfinders that aim to develop an integrated carbon accounting framework for a chosen subset of industry sub-sectors and industrial clusters. This would act an important intermediate step towards developing an industry-wide framework, including understand the digitalisation tools required to support the transition.
- To support carbon accounting in industry, explore establishing a Carbon MRV and Accounting Regulator. Such a body would be responsible for ensuring MRV is consistent and comparable across mechanisms, including mitigating double counting. Ensuring quantifiable emissions reduction occurs in line with Carbon Budgets and the Paris Agreement through supporting policymakers. This should build on (and extend) Government’s commitment in the Net Zero Strategy to explore options for regulatory oversight to provide consistent MRV of greenhouse gas removals.
- Improve digitalisation to simplify reporting and verification processes and increase transparency of emissions data for external decision makers. An open-source digital carbon accounting platform could facilitate data aggregation for regional and sub-sector emissions to help with tracking and decision making, while protecting sensitive company data. Such a platform could use emissions data already reported at the installation level via the UK ETS’s reporting platform.

*ESC recognises that further work will be required to ensure that changes in carbon accounting requirements align with government’s wider decarbonisation commitments and targets. Given the large role businesses will need to play to reach net zero improving the methodology for carbon accounting is essential.*

# Policy

## Royal Society explores the prospects of geological carbon storage

Luana Graca, [l.graca@cornwall-insight.com](mailto:l.graca@cornwall-insight.com)

On **19 October**, the Royal Society published a policy briefing report titled *Locked away -geological carbon storage* where options for geological carbon dioxide (CO<sub>2</sub>) storage are presented, with the aim of removing CO<sub>2</sub> from the atmosphere and injecting it offshore into either deep saline aquifers or depleted oil and gas fields.

In the report, the Royal Society notes that global greenhouse gas emissions have increased by 12% in the last decade (amounting to the highest increase in decadal average emissions on record) and, to limit warming to 1.5°C or less, future projections claim the global greenhouse gas emissions must peak between 2020-2025, fall by 45% in 2030 and reach net zero by 2050. The deployment of carbon capture and storage (CCS) systems is presented as a 'vital' contributor intended to help UK sectors that will struggle to decarbonise by the 2050 targets.

The report highlights examples of what it considers to be successful CO<sub>2</sub> geological storage including the Sleipner Field in Norway which has stored 25MtCO<sub>2</sub> over the past 25 years. Although these large-scale projects have demonstrated the ability to monitor CO<sub>2</sub> plume, there are challenges highlighted in the report involving the process itself, with a few being: sand production in pressure relief wells; the complexity of the flow in lower permeability formations; and the need to control pipe corrosion.

The Royal Society argues that global rates of CCS deployment are 'significantly' below those anticipated to be needed to limit global warming to 1.5°C or 2°C with global storage infrastructure only accommodating to 40MtCO<sub>2</sub>/yr when it has been estimated that there is a need for 7-8GtCO<sub>2</sub>/yr by 2050, and a cumulative storage of around 350-1,200GtCO<sub>2</sub> by 2100 to keep temperatures below the 1.5°C rise threshold.

The society reports that current UK policies focus on regional decarbonisation and industrial clusters as around a half of UK industrial emissions, valued at 37.6MtCO<sub>2</sub>e in 2018, are in clustered areas. Doing this therefore provides an opportunity to share decarbonisation solutions, activities, and systematic efficiencies.

Recommended policies include a Regulated Asset Base model to support pipelines and operating expenditure, Contracts for Difference (CfDs) to pay for electricity, and capital co-funding for construction. The Royal Society states that UK Research and Innovation (UKRI) has committed over £200mn in funding to support six different clusters across the UK to decarbonise, as well as nine projects (three being offshore and six onshore infrastructure projects). Moreover, the UK Government has set a target to deploy CCS in four clusters – two proposed to be delivered by mid-2020s and the remainder by 2030 – which is predicted to capture and store ~20-30MtCO<sub>2</sub>/yr.

The policy brief concludes with the following recommendations of scientific priorities given the current technical challenges related to CO<sub>2</sub> storage:

- Improving predictions of plume migration and storage capacity of specific fields in detail.
- Assessing storage safety and the critical pressures for failure of the seal rocks, the potential ensuing leakage pathways, and developing assurance of the long term-term safety of the system.
- Testing and combining monitoring strategies for subsurface CO<sub>2</sub> detection.
- Developing approaches to enhance the storage capacity of a given system, by using novel additives or modifications to well-arrays and injection strategies.

*CCS is highlighted here as an important tool in the kit to keep us on track with our global warming targets.*

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On 31 October, [Public Ownership of Energy Companies](#) was debated in the House of Commons in response to petitions raised around the subject, as well as [Bus Manufacture in the UK](#) where the importance of electric bus manufacturing in the UK was discussed. The [following day](#), the *UK Infrastructure Bank Bill [Lords]* was debated at a second reading in the House of Commons where it was sent to the Committee Stage, [scheduled](#) for 22 November 2022.

On 2 November, a number of Oral Answers to Questions relating to COP26 were debated in the House of Commons, including [International Energy Self-sufficiency](#) and [Net Zero Strategy and Carbon Budgets](#). The following day, an answer to a question on [Energy Sector: Trade Opportunities](#) was debated in the House of Commons and [Climate Change: Behaviour Change](#) was debated in the House of Lords.

A number of Written Statements were made in the House of Commons. This included a Written Statement made by the Minister for Climate, Graham Stuart (Beverley and Holderness, Conservative) on [31 October](#), titled *Energy Support Package: Secondary Legislation*, where he stated: “The Energy Prices Act 2022 received Royal Assent on 25 October 2022. The Act establishes the legislative framework necessary to deliver the government’s energy support package and will ensure that households and businesses receive the urgent support they need to help pay their energy bills this winter. To ensure these crucial schemes are placed on a secure legislative footing, the government are tabling a number of statutory instruments (SIs) using the powers in the Energy Prices Act.” On the [same day](#), a Written Statement was made by the Secretary of State for Business, Energy and Industrial Strategy, Grant Shapps (Welwyn Hatfield, Conservative) titled *Bulb Energy Administration and Energy Bill Relief Scheme*, providing an update on the mergers and acquisition process for Bulb Energy in special administration. He said: “The energy administrators and their MSA advisers have delivered a competitive and extensive sales process over recent months, culminating in their recommendation to transact Octopus Energy’s bid as the optimal way to achieve their statutory objectives.” He later added: “I have therefore approved the Octopus bid transaction and associated amendments to the existing funding facility and establishment of their new loan facility.” On [3 November](#), a Written Statement was made by the Parliamentary Under-Secretary of State for Work and Pensions, Laura Trott (Sevenoaks, Conservative), where she said: “Later today I will lay before this House the Office for Nuclear Regulation (ONR) annual report and accounts 2021-22. These documents will also be published on the [ONR website](#).”

The Public Accounts Committee published a report on [2 November](#) highlighting that the UK Government is currently not meeting its commitment that the public sector should “lead by example” on the road to net zero. The committee stated that less than half of departments comply fully with the mandatory elements of HM Treasury’s reporting requirements, noting that BEIS has overall responsibility for delivering net zero, but does not “hold individual departments to account”.

The [following day](#), the Environmental Audit Committee announced that it has opened a new [inquiry](#) examining the role that onshore solar energy technologies can play in the UK’s journey to net zero. Forming part of the wider Technological Innovations and Climate Change inquiry, this inquiry will investigate the barriers to expansion of solar installations and the land-use risks associated with increasing the number of solar farms in the UK. It will also consider the security and sustainability of the supply chain for solar panels and energy storage technologies. The Committee has issued a [call for evidence](#) seeking views on a number of questions, with submissions open until 1 December 2022.

The BEIS Committee held an oral evidence session on *Decarbonisation of the power sector* on [1 November](#) to [examine](#) whether the UK can meet its 2035 low-carbon power sector goal. The following day, an oral evidence session on [Sustainable timber and deforestation](#) was held by the Environmental Audit Committee to [question](#) Drax and academics on the sustainability of feedstock supplies for bioenergy and increasing UK produced biomass. An oral evidence session on *Delivering nuclear power* was also held on [2 November](#) by the Science and Technology Committee to [question](#) academics and industry on UK nuclear power supply, with another session scheduled for [9 November](#).

## **COP27 climate conference to commence on Sunday 6 November**

The 2022 United Nations Climate Change Conference, [COP27](#), is scheduled to begin in Sharm El Sheikh, Egypt on Sunday 6 November, running to Friday 18 November. Ahead of the event, King Charles will [hold](#) a pre-conference reception at Buckingham Palace on Friday 4 November, bringing together 200 business leaders, politicians, and campaigners.

On [2 November](#) Prime Minister Rishi Sunak confirmed that he would be attending the event.

## **Public Accounts Committee finds government failing to lead on net zero**

The Public Accounts Committee published a report on [2 November](#) in which it finds that the UK Government is currently not meeting its commitment and that the public sector should “lead by example” on the road to net zero. It argues that the current measurement and reporting arrangements for public sector emissions fail to demonstrate to parliament or the public how the public sector is progressing on decarbonisation and whether it is on track to meet its longer-term targets.

The committee states that less than half of departments comply fully with the mandatory elements of HM Treasury’s reporting requirements, noting that BEIS has overall responsibility for delivering net zero, but does not “hold individual departments to account”.

Dame Meg Hillier MP, Chair of the Public Accounts Committee, said: “The targets set to maintain our world in a liveable state are not ‘nice to have’. Government made a legally binding commitment to deliver net zero by 2050. Government promised to lead the way to national decarbonisation but isn’t even putting its own house in order. Vague guidance and lack of follow up make it hard for the public to hold the Government to account. A free for all on reporting veils progress or lack of it. Government needs to be clearer and must publish consistent standards for measuring and reporting emissions across the public sector so that it can be properly held to account.”

## **Phase 2 of Industrial Fuel Switching Competition opens**

On [1 November](#), BEIS announced that Phase 2 of the Industrial Fuel Switching Competition has opened. Under this phase of the competition, the government will provide up to £49.4mn in funding, with £1mn to £6mn available per project, to demonstration projects of fuel switching and fuel switch enabling solutions.

Phase 2 is open to all industrial sectors and fuel switching technology developers, whether or not they have taken part in Phase 1. Funding will be awarded through Small Business Research Initiative (SBRI) contracts, providing 100% funding for pre-commercial solutions. Funding is divided into 3 lots:

- Fuel switch and fuel switch enabling technologies for hydrogen.
- Fuel switch and fuel switch enabling technologies for electrification.
- Fuel switch and fuel switch enabling technologies for biomass, wastes, and other net zero compatible fuels.

## **Energy UK calls on government to increase support for energy efficiency**

In a press release on [Monday 31 October](#), Energy UK urged the new government to ‘ramp up’ support for the energy efficiency of buildings in the next Budget, stating that consumers are paying the price of the government’s inaction on leaky homes. It highlighted that it has put forward proposals for a scheme, known as ECO+, which would build on the existing Energy Company Obligation (ECO) and be co-funded by the government.

It said that its analysis shows that if ECO+ had been in place in the run up to October 2022, it could have improved 702,000 homes with loft and cavity wall insulation and that those improved homes would have spent £280 less on their bills, each saving the government £120 in Energy Price Guarantee costs. It adds that this would have reduced spends on gas £85mn and £199mn respectively (October 2022 – March 2023).

“Many homes are wasting gas, and subsequently lots of money, for no reason. We need to avoid making the

same mistake for next winter and ramp up the installation of energy efficiency measures now,” says Louise Shooter, Policy Manager at Energy UK. “The turbulence in Government has delayed many policy decisions, but this is not one we can afford to wait on. High energy bills are likely to continue into next year, so the Government needs to get on with it.”

Shooter added: “Earlier this year the Prime Minister spoke about the need for an energy efficiency programme, so we hope he delivers in this at the forthcoming budget as it’s good for households, the economy, jobs and the public purse – as well as UK energy supply, and carbon emissions.”

## BBC reports £400 energy support vouchers going unclaimed

The BBC has reported on [31 October](#) that a large number of consumers with prepayment meters are yet to redeem £400 energy support vouchers designed to help with bills. It states the Post Office – the UK’s biggest voucher processor – has said only 60% of those eligible had redeemed the credits so far, which are valid for 90 days. Payroll Plus who process the vouchers reported on [2 November](#) that it expected to process 800,000 vouchers in October, worth a total of £52.8mn. However, the business said only £27mn had been redeemed to date.

Rocio Concha, Which? Director of Policy and Advocacy, [said](#): “Energy firms must ensure that customers on prepayment meters – who are more likely to be vulnerable and on lower incomes – are able to access government support and prioritise them in their smart meter roll-outs where appropriate, so that financial support can be delivered automatically. They must also ensure that their prepayment customers know that they’ll get the discount from the first week of each month in one of the following ways: as redeemable vouchers, sent by SMS text, email or post, or as an automatic credit when they top up at a top up point”.

## Scottish Government announces additional support funding measures

As part of the publication of its Emergency Budget Review on [2 November](#), the Scottish Government announced that it will seek to provide further help to those most impacted by the cost-of-living crisis. Measures outlined include doubling the Fuel Insecurity Fund and extending energy advice to businesses by investing £300,000 to expand the services of Business Energy Scotland, while also doubling the value of the SME energy efficiency Loan and Cash Back Scheme for energy efficiency to £20,000.

**Free webinar**

# Winter Outlook 2022:

*What to expect for GB wholesale energy markets?*

 **Tuesday 8 November**  
2:00 PM - 3:00 PM GMT

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# Regulation

## Scheme documents for the Energy Price Guarantee and Energy Bill Relief Scheme issued

Hattie Lunn, [h.lunn@cornwall-insight.com](mailto:h.lunn@cornwall-insight.com)

On **31 October**, BEIS issued its scheme documents for the Energy Price Guarantee (EPG), outlining further technical guidance for suppliers and scheme administrators. This was followed on **1 November** by the scheme documents for the Energy Bill Relief Scheme (EBRS), similarly detailing further rules and guidance.

Since both the EPG and EBRS were announced by the government in early **September** in response to the ongoing energy crisis, the scheme documents for both have been highly anticipated to provide more granular detail on how each scheme will work and be applied by suppliers.

For the EPG, which maintains the average household's energy bills at £2,500/year rather than what it would have been under the Default Tariff Cap (£3,549/year for the October-December period), the scheme documents provide some key information regarding:

- A supplier's duty to reduce tariffs, which must be based on the support price provided by the Secretary of State. This must be applied to a supplier's base tariff to its reduced figure, subject to the reduced tariff floor. After doing so, they must also give notice to the customer of their reduced tariff.
- It details how payments will be determined, including the calculations used to produce the reduced tariff floor adjustment, which is the amount determined payable by the supplier.
- The end date of the scheme on 31 December 2022, with the Secretary of State able to extend this by three months.
- How suppliers should address statement errors, for example where incorrect data or calculations have been used in determining amounts of making payments. Consumers that have been overcharged should be credited promptly, and a process established for querying errors involving other parties under the scheme.

Other areas of the documents cover the circumstances of an early end of a supplier's participation, the designation of the scheme administrator, and the reporting and audit requirements under the scheme. It also contains schedules of the scheme timetable and calculations.

On the following day, the government also published the rules, guidance, and scheme documents relating to the EBRS. This scheme was introduced alongside the EPG, to provide relief to non-domestic customers faced with high energy bills. Amongst the documents there are also publications detailing the equivalent support implemented in Northern Ireland. The rules pertain to energy suppliers, scheme administrators, and non-domestic energy customers.

The guidance on the EBRS scheme is informed by both the EBRS Rules and EBRS Regulations. It includes information on several different scenarios with worked examples, and covers:

- The minimum supply price which customers should face (excluding VAT and Climate Change Levy).
- Separating flexible rate contracts into components for (i) intermediaries; (ii) multi-site customers; and (iii) customers involved in providing balancing services.
- Combined Heat and Power (CHP) plants under 5MW of generating capacity.

As the first month of each scheme has now passed, the documentation published should allow suppliers to better refine their processes and ensure they meet with the requirements and rules set out by BEIS.

*With the much-anticipated scheme documents published for the government's two key support mechanisms for consumers across both domestic and non-domestic markets, the clarity on the technical details will be welcomed by both suppliers and administrators.*

## Ofgem's decision to progress the Harker project to a Final Needs Case

On [31 October](#) Ofgem issued its decision on the Initial Needs Case (INC) assessment for the Harker Energy Enablement electricity transmission project, following a [consultation](#) in which the regulator provided its minded-to decision supporting the needs case. The project was proposed by National Grid Electricity Transmission (NGET) under the RIIO-2 Large Onshore Transmission Investment (LOTI) reopener, the purpose of which is to assess large electricity transmission projects that come forward during the RIIO-ET2 price control (1 April 2021 to 31 March 2026).

The project seeks to implement a full substation replacement to facilitate the connection of renewable generation to Electricity North West Ltd (ENWL) and Scottish Power Transmission (SPT) networks and reduce SF<sub>6</sub> emissions. The site currently provides two of the four cross-border 400kV onshore circuits connecting NGET's transmission system in England with the SPT system in Scotland. A cost benefit analysis estimated that the whole life costs of the project would be £237mn and is scheduled to be delivered by 2028.

The regulator confirmed in its decision that there is a clear needs case for the project, noting the continued deterioration of assets on the 132kV substation and the need for greater reverse power infeed into the substation to accommodate the additional embedded generation on the network. It also confirmed that the project will be retained under the LOTI mechanism, as well as providing the view that the project is unlikely to meet the criteria for 'late model' competition as a whole.

The project will now progress to a Final Needs Case assessment once planning consent has been obtained, which NGET expects to occur towards the end of Q123.

## Views sought on IGT modification to support implementation of EPG

On [28 October](#), the consultation for IGT162 *Appointment of CDSP as the Scheme Administrator for the Energy Price Guarantee (EPG) for Domestic Gas Consumers (Gas)* was issued. This modification has been raised to recognise the Central Data Service Provider (CDSP) as the administrator of the Energy Price Guarantee (EPG) scheme for IGT supply meter points. It would reflect within the IGT the assignment of the function of EPG scheme implementation and administration to the CDSP as introduced within the UNC by modification [UNC824](#) of the same name which was implemented on 26 September.

The EPG limits the unit price of gas and electricity in order to reduce household energy bills, it is not however a cap and therefore consumer bills will still reflect the amount of energy used.

Under the scheme, shippers and suppliers with domestic portfolios in end user category bands one and two will be eligible and are expected to join. This will ensure that domestic consumers connected to IGT networks receive a reduction in energy bills as part of the EPG. Suppliers are expected to reduce the tariffs that would otherwise be charged to consumers by the value of the support payments made under the scheme. The cost of the CDSP's administration of the EPG Scheme will likely be recovered by parties including IGTs.

Responses are requested by 16 November with the intent to implement the modification as soon as possible.

## Final Order issued to Delta Gas and Power for outstanding RO payments

On [31 October](#), Ofgem announced that it has [issued](#) Delta Gas and Power (Delta) with a Final Order compelling the company to pay £530,809.20, plus interest, in outstanding Renewables Obligations (RO) payments by the late payment deadline of 31 October.

Delta is a supplier for 1,690 business customers in the UK and was first issued notice of the Final Order on 28 September as it failed to pay into the buy-out fund on 31 August or to present the required amount of Renewable Obligation Certificates (Rocs) by 1 September. Ofgem requested on 7 September that Delta make sufficient assurances that it would make the payments along with daily interest by the late payment deadline of 31 October and while Delta offered information, this was not deemed sufficiently assuring.

Ofgem set a deadline of 19 October for representations or objections to the proposed Final Order and while Delta paid its RO (Scotland) during this consulting period, the rest of the RO is still outstanding. Following the consultation, the Enforcement Decision Panel decided to formally issue a Final Order. This required Delta to fully settle its RO for the period 1 April 2021 to 31 March 2022, a sum of £530,809.20, plus interest, by 31 October 2022.

Ofgem [reported](#) that of the 127,815,053 ROCs it was expecting to be presented with, 14.48% or 18,502,894 were missed. There was also a shortfall in the buy out fund of £163,399,058.88 with 36 suppliers not meeting their obligations by the deadline and now owing late payments. The interest of these late payments is an annualised rate of 6.75% or 5% plus the Bank of England base rate.

## Views sought on the DCC's price control submission for 2021-22

On [1 November](#), Ofgem issued a consultation setting out its position on the DCC's price control submission for the 2021-22 regulatory period, including costs, revenues and margin application. During this period, the DCC's total reported costs reached £532.55mn, an increase of 14% from what was forecast the previous year. This is in part due to Ofgem's decision from the 2020-21 period to disallow £31.87mn of forecast cost for 2021-22, however overall costs have fallen since last year by 18% from £650.28mn.

The total costs covering the licence term 2013-26 are now forecast to be £4.5bn, an increase of 12% from last year's forecast. Subject to further evidence, Ofgem is also currently of the position that £7.91mn of the DCC's Internal Costs in 2021-22 are Unacceptable Costs and that a redacted portion of External Costs in 2021-22 are Unacceptable costs. Ofgem is inclined to disallow a further forecast of Internal costs for £35.85mn and External costs for £65.788mn for 2022-24 due to lack of justification.

Ofgem proposes that £5.36mn the DCC's Baseline Margin should be retained out of an available £6.76mn, with the £1.4mn reduction attributed to system performance, customer engagement performance, and performance in the contract management incentive.

The Baseline Margin adjustment mechanism was included in the licence to recognise the uncertainty when the licence was granted over the nature and risk of the DCC's Mandatory Business over time. It is intended to ensure that the DCC is compensated for material changes in certain aspects of its Mandatory Business under the licence. The regulator said that it is minded-to amend the DCC's application for a £13.27mn adjustment to its Baseline Margin to an adjustment £6.97mn, which is a decrease of £6.3mn.

Ofgem also found the DCC to be in breach of the over-recovery of revenue threshold of 110% of allowed revenue, with the DCC having £563.9mn in regulated revenue compared to its £499.7mn of allowed revenue at a ratio of 113%. Ofgem is proposing to apply the licence penalty interest rate of 3% plus Bank of England base rate to the over-recovered 3%.

The consultation will close on 29 December 2022, with a decision expected to be published in February 2023.

## Ofgem's minded-to position to address high balancing costs

On [4 November](#), Ofgem issued a call for input on how high balancing costs should be addressed. Over the 2021-22 period, National Grid Electricity System Operator (NGESO) incurred balancing costs in excess of £3.1bn, with winter costs increasing to over £1.5bn, where this would usually average less £500mn. In tandem with the ongoing gas crisis, the large increase has been driven largely by increased offer prices, rather than increased volumes having to be purchased by NGESO.

The consultation follows an open letter that was issued in July 2022, in which the regulator produced a shortlist of six options to address increased balancing costs: a price cap on balancing mechanism (BM) offer prices; changes to bid/offer structures; a new NGESO balancing service; a new generation licence condition; a restriction on amending Physical Notifications (PNs) after the day-ahead stage; and clarifying 'good industry practice' within the Grid Code. These options were considered against four criteria measures, such as compatibility with existing market design and ease of implementation.

Through its own analysis, Ofgem's preferred approach is option four, which would introduce a new condition to the electricity generation licence to prohibit generators from gaining excessive benefit in the BM after they have reduced their PNs to zero. This would be aimed at situations when PNs are altered to zero with little warning for NGESO, for example when PN revisions occur on the same day as the settlement period that the PN relates to. Responses to the call for input are requested by 5 December 2022.

We will cover this in more detail in a future issue of *Energy Spectrum*.

## Demand Flexibility Service goes live following Ofgem approval

On [4 November](#), Ofgem approved National Grid Electricity System Operator's (NGESO's) proposal to go-live with the Demand Flexibility Service (DFS), which is now set to run through the winter until 31 March 2023. NGESO said it will run the first demonstration events "in the coming days", which will include a guaranteed acceptance price for the providers that participate £3,000/MWh, or £3/kWh.

Those taking part will be given 24 hours' notice of a test day where they will be asked to reduce their peak-time electricity use during a one-hour period identified by NGESO, likely to be between 16:00 and 19:00. Companies that have already announced participation in the service include [E.ON Next](#), [Ovo Energy](#), [Octopus Energy](#) and [Fuuse](#). A typical household could save £100 by participating, according to NGESO.

Ofgem published a series of decisions and directions to implement the DFS, including: a [decision](#) to enable terms and conditions related to balancing to be updated; a second [decision](#) granting NGESO a derogation from Article 6(4) of the Electricity Regulations in order to allow the DFS to be procured ahead of gate closure; and a [direction](#) to make changes to its licence statements, including the Balancing Principles Statement and Procurement Guidelines Statement to reference the DFS.

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### Capacity Market forecast: A view on short-term and long-term auction prices

Gain an in-depth assessment of potential auction prices and dynamics, with updates in the lead up as well as a long-term view. The report includes a review and analysis of auctions once they have cleared, detailing final clearing prices and capacity and the impact of the results in future auctions.

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# Industry Structure

## BEIS publishes Q322 Renewable Energy Planning Database

Lucy Dolton, [l.dolton@cornwall-insight.com](mailto:l.dolton@cornwall-insight.com)

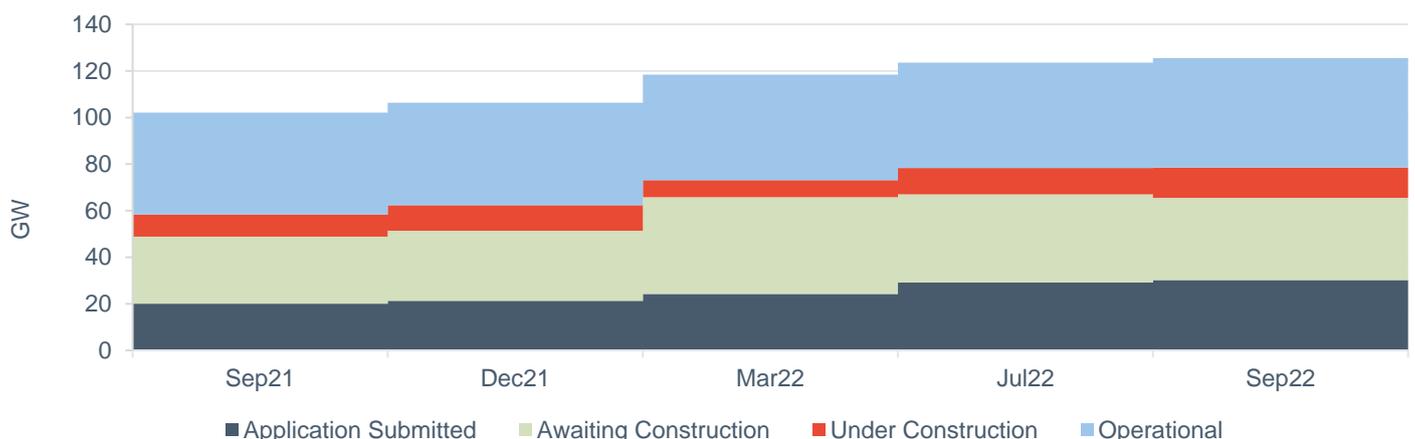
On **28 October**, BEIS published the Q322 update to its Renewable Energy Planning Database (REPD). The REPD provides an overview of operational and planned renewable energy projects, including battery storage, across the UK.

Since the previous quarter, by development status, there is now a total of 46.9GW of operational renewable energy capacity, an increase of 1.7GW. This follows the 1.3GW Hornsea 2 Offshore Wind Farm reaching operational status, alongside 0.1GW of Onshore Wind capacity, 0.2GW of Battery capacity, and >0.1GW cumulatively of Anaerobic Digestion, and Solar PV. The total number of projects with a development status of awaiting construction has fallen by 2.5GW to 35.3GW; capacity classed as under construction now totals 13.0GW, up 1.7GW; application submitted capacity now stands at 30.2GW, up 1.1GW quarter-on-quarter; while projects classed as planning permission expired has increased by 1.6GW to total 2.8GW.

A further 394 projects have entered the planning database since Q222, representing 5.7GW of new capacity. Deducting for projects that are classed as application refused, application withdrawn, and operational, 5.4GW of this is pre-operational: 4.6GW classed as application submitted; 0.07GW classed as awaiting construction; and 0.02GW classed as under construction. By technology, Battery projects dominate new capacity, at 2.4GW, alongside 1.8GW of Solar PV projects, 0.08GW of Offshore Wind projects, 0.05GW of Onshore Wind projects.

With the outcome of Allocation Round Four (AR4) of the Contracts for Difference scheme (CfD) being published back in July, and with confirmation of annual CfD auctions being published earlier this year, the continued increase in CfD-eligible technologies comes as no surprise to the wider renewables development pipeline. Furthermore, BEIS published the AR5 draft timeline on **14 October**, with it announced that it is planned for AR5 to open to applications in March 2023. With AR4 of the CfD scheme being highly competitive, and amid this expansion in new renewable energy projects over Q322, competition levels are set to remain high looking ahead to AR5.

**Figure 1: Renewable capacity across development statuses "Application Submitted", "Awaiting Construction", "Under Construction" and "Operational", September 2021 to September 2022**



Source: BEIS data, Cornwall Insight analysis

*CC Cornwall Insight will be focusing on the developments relating to the framework and sealed bid window for AR5 as they occur, including providing pipeline analysis and strike price forecasting. If you would be interested in any of these services, please contact Alex Asher at [a.asher@cornwall-insight.com](mailto:a.asher@cornwall-insight.com)*

# Industry Structure

## Understanding energy market change: our research output

Daniel Atzori, [d.atzori@cornwall-insight.com](mailto:d.atzori@cornwall-insight.com)

The last year has seen a huge number of changes for UK and global energy markets, with ramping-up of net zero commitments against a background of soaring energy prices and market re-structuring. Our Research Team have produced a large number of reports providing insight on a broad range of energy topics.

[Consolidation in the domestic energy market](#), in partnership with Shoosmiths – September 2021

The domestic energy supply market has gone through a period of intense competition. After reaching a peak of 62 in 2018, the number of fully licensed suppliers has fallen to under 50 at the time this report was written. Challenging market conditions have seen exits through acquisition or the Supplier of Last Resort (SoLR) mechanism, which has ultimately led to a supplier licensing review.

[Securing the UK's role as a green financial hub](#), in partnership with TLT – September 2021

Ahead of COP26, Cornwall Insight and TLT spoke to industry leaders about the UK's progress with building a green finance market and what's needed to make green finance mainstream. As the whole world looked to the Glasgow summit for new, progressive policies, what do businesses, investors and financial institutions deem genuine and artificial support for the green economic recovery?

[Industrial decarbonisation key for UK low carbon hydrogen](#), October 2021

Hydrogen has an important role in decarbonising the industrial sector; simultaneously, industries need to redesign and reinvent their processes to use hydrogen. Low carbon hydrogen should be adopted in applications with maximum emission reduction potential to maximise its decarbonisation potential.

[Electric vehicle charging: unlocking the business models](#), in partnership with TLT – October 2021

Cornwall Insight and TLT spoke to stakeholders in the Electric Vehicle (EV) charging space about the charging infrastructure market and the business models that support it. The UK's 2030 petrol and diesel car sales ban is igniting the charging infrastructure race. There are still challenges related to technology, regulation, and consumer behaviour, and the discussion on the market readiness of EV charging infrastructure is ongoing.

[An equitable transition to net zero](#) – October 2021

This paper addresses one of the fundamental issues in the transition to net zero: how to resolve the accrual of national decarbonisation benefits with the imposition of regional network costs through distribution charges. From the lens of North Scotland, where the tension is most explicit, it illustrates how reforms of different varieties will have wider distributional effects on all users of the power system. Our analysis suggests that reform is absolutely necessary if fair and sustainable decarbonisation is to occur.

[Unlocking net zero strategies for business](#), in partnership with Shoosmiths – November 2021

An increasing number of businesses are looking to reduce their emissions and become sustainable to align with the government's net zero strategy. Setting targets is crucial for companies with complexity across sectors, technologies and business structures. This paper, in partnership with Shoosmiths, explores the potential routes to decarbonisation that businesses have at their disposal to meet their targets and help countries meet their net zero targets.

[Addressing the cost of electrification](#), in partnership with the Confederation of Paper Industries (CPI) – February 2022

This report, sponsored by the Confederation for Paper Industries (CPI), outlines the challenges that energy intensive industries (EIIs) face in decarbonising their heat supply, by switching to grid-supplied electricity. Many of the challenges highlighted here may be applied to other energy-intensive industrial sectors. Our analysis indicates that switching heat generation from natural gas to electricity is not currently a commercially

viable option for industry.

[\*The UK and the energy transition. Leading the way?\*](#), in partnership with Womble Bond Dickinson – May 2022

The United Kingdom is well placed to play a key role in global efforts to dramatically reduce carbon emissions over the coming decades. While the country has well-founded ambitions to become a leader in specific technologies, there is still a clear requirement to strengthen supply chains and address the uncertainties of a rapidly changing market for renewables. In this report, we assessed the main opportunities and challenges facing the UK when it comes to major low carbon technologies, such as solar photovoltaic (PV), onshore and offshore wind, and hydrogen.

[\*A corporate's guide to decarbonising power\*](#) – July 2022

From 6 April 2022 it has become mandatory for over 1,300 of the largest UK-registered companies to disclose their climate-related financial information in line with the Taskforce on Climate-related Financial Disclosures (TCFD) recommendations. As part of this, all corporations on the Financial Conduct Authority's Official List (are "listed") are required to report their annual UK energy use and greenhouse gas emissions. This report will focus on on-site generation of low-carbon energy and the purchasing of low-carbon energy through a CPPA.

[\*Battery-as-a-service: an underexplored opportunity?\*](#), in partnership with Shoosmiths – July 2022

At the end of 2020, the government published a plan to put an end to the sale of new petrol and diesel cars in the UK by the end of the decade. This target brought into sharp focus the practical challenges associated with achieving such a goal. One of the biggest challenges is meeting the need for an extensive electric vehicle (EV) charging infrastructure. This report has been commissioned by Shoosmiths to consider the merits and challenges of BaaS (battery-as-a-service) and whether it is a viable option for the UK; whether to supplement 'traditional' charging infrastructure, or to help meet demand in specific conurbations.

[\*Weathering the storm: mitigating the impact of the energy price hike for businesses\*](#) – September 2022

The challenging gas supply situation and record-high electricity prices are putting considerable pressures on the GB economy. Wholesale energy prices are set to rise even further, constraining the growth of businesses that were starting to recover from the scars of the pandemic. This paper sets out the potential impact of rising energy prices on businesses by exploring cost projections as well as the geographic and sectoral spread of impacts across GB. It also contains a discussion on potential approaches to mitigate exposure to cost increases.

[\*Unlocking REMA\*](#) – September 2022

Recent challenges have emphasised the recurring importance of the energy trilemma. The government announced its Review of Electricity Market Arrangements (REMA) in April 2022 to address these issues. In July, the government published a consultation paper for REMA, presenting a number of proposed reforms. This paper helps to shed light on this topic, breaking down key proposals and explaining their potential benefits and areas of concern.

[\*Counting the costs: Forecasting the financial impacts of the Energy Price Guarantee on the UK Government\*](#) – October 2022

September 2022 saw the introduction of policies to address the cost of the energy crisis. On the domestic front, the Energy Price Guarantee (EPG) has been implemented as a support scheme for households from 1 October 2022. In this paper, our experts have applied modelling and qualitative analysis to identify what the difference may be between the EPG price levels and the potential costs of energy for consumers across the intended two years of the scheme. We have produced four scenarios, relying on our proprietary wholesale price modelling in conjunction with our assessment of the Default Tariff Cap.

## Understand REMA with our new portal

*Our new REMA portal is a focused hub that will help you to understand everything about the Review of Electricity Market Arrangements (REMA).*

[Visit the portal](#)

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## **SP Energy Networks invests in two wind energy projects**

On [28 October](#), SP Energy Networks announced it is completing two investment projects that use wind energy. South Kyle Windfarm was connected to the electricity network through the company's New Cumnock substation. SP Energy Networks expects 170,000 homes and businesses in the surrounding area are set to get a constant flow of locally generated renewable energy while also increasing network resilience.

The company also recently completed the construction of the Cumberhead Collector Substation in South Lanarkshire, which will connect two additional windfarms to the electricity transmission network. Shijo Vadakkekunnel, Senior Project Manager in our Transmission Major Projects Team, said: "Homes and businesses across South Ayrshire and South Lanarkshire are already benefiting from the new clean energy supply from these connections. Enabling the connection of more windfarms onto our network is really important to help tackle the climate emergency, reduce carbon emissions and increase the UK's energy security. Scotland has been a pioneer in the transition to renewables and our innovations have enabled that rate of change - ultimately, helping us build a better future, quicker, for everyone."

## **Zap-Map analysis finds public EV charging prices up 14% since June**

Chargepoint mapping service provider Zap-Map published on [28 October](#) analysis that it states shows that electric vehicle (EV) drivers are paying 14% more to charge an EV on the public network since June this year. Zap-Map's Price Index shows that, in September 2022, the average weighted price of charging at a slow or fast charger was 39p/kWh in the UK (up from 34p/kWh in June 2022), while the price for a rapid or ultra-rapid chargepoint was 56p/kWh (up from 49p/kWh). Zap-Map attributes the price rise to increases in wholesale electricity prices.

Zap-Map adds that despite the rise it is still cheaper to run an EV than internal combustion engine (ICE) vehicle. It states that charging at home 80% of the time saves around £1,200 per year versus an ICE car. When looking at only charging on the public network using a combination of slow/fast and rapid/ultra-rapid charging would save around £900 per year.

Melanie Shufflebotham, Co-founder & COO at Zap-Map, said: "Although the results of our survey show many EV drivers are keeping a close eye on the rising costs of electricity, it's still significantly cheaper to run an electric car than a petrol or diesel vehicle."

## **National Grid announces £50mn energy support fund**

On [1 November](#), National Grid announced the launch of a £50mn support fund designed to help alleviate financial distress caused by rising energy costs over the next two winters. The fund will be targeted at charities that provide immediate, emergency financial relief to households using pre-payment energy meters; charities who fund energy efficiency measures to lower bills over the long-term; and charities providing advisory services for households who need help with energy bills, payments, and debt.

Beneficiaries of the announced pledges are to include the Fuel Bank Foundation (£10mn), Citizens Advice (£10mn), Affordable Warmth Solutions (£10mn), and National Energy Action (£1.5mn). The remaining £15mn will be distributed to organisations identified by National Grid as providing direct help and support to those who need it most.

John Pettigrew, Chief Executive of National Grid, said: "We're under no illusions that this winter will be financially very, very hard for many people and we're determined to play our part to help ease the financial burden that households will face. Over the next 18 months, we'll be working to ensure that help is reaching those who need it most."

## **Gore Street Energy acquires a 200MW energy storage project**

On [31 October](#), Gore Street Energy Storage Fund announced its acquisition of an 200MW energy storage project from Kona Energy. Located in Heysham, North West England, the energy storage project is set to connect to the National Grid's main transmission network rather than the local distribution network which means it will operate independently from an intermediary network operator. Connection to the grid is expected to be no later than Q426.

The project is expected to be capable of deploying a storage system with a duration of up to 2 hours.

Alex O'Kinneide, CEO of Gore Street Capital Limited, the Company's investment manager, commented: With the acquisition of this landmark 200MW transmission-connected project from Kona Energy, our largest acquisition yet, the Company has further strengthened its leadership position in the GB market. We are encouraged that an asset of this scale will benefit from being connected to the main transmission network, providing attractive running cost savings and potential additional revenue streams. We remain very selective on new acquisition opportunities focusing on those, such as this project, with significant cost and revenue advantages.”

## ENA announces the development in networks' green gas readiness

On [2 November](#), Energy Networks Association (ENA) announced that gas networks have confirmed that it is possible to blend hydrogen into the existing network, replacing up to 20% by volume of the natural gas in the system. Its newest research titled *Enabling hydrogen blending from industrial clusters* explored the capability of the existing gas network to transport sustainably sourced, blended hydrogen with limited need to change existing gas commercial and regulatory frameworks.

Through the [Gas Goes Green](#) programme, gas network companies have assessed how to blend hydrogen into the gas network from the hydrogen industrial clusters which are already in development, thereby maximising the benefits they can bring. Network companies have mapped out where this blending capacity can be delivered within [Britain's Hydrogen Blending Opportunity](#), with the maps showing that there is around 35TWhrs per year of blending capacity in the Gas Distribution Network alone, which is enough to heat ~3mn homes with hydrogen and save ~6mn tonnes of CO<sub>2</sub>. The research also highlighted some policy changes to support delivery

- Funding: BEIS will need to provide hydrogen producers in industrial clusters with clarity around the nature of funding for blending into the gas networks, and any conditions attached to it.
- Coordination of injection locations: ensuring that a total system view is taken when industrial clusters' locations are determined.
- Assessment of connection applications: with enhanced impact assessments that reflect network blends, settlement, and billing, etc.
- Determination of entry conditions: ideally through the standardisation of Network Entry Agreements.

## British Gas reports on Net Zero index and launches Net Zero business unit

On [2 November](#), British Gas released its first UK Net Zero index, which will track each year how families feel about the journey to net zero, their role, and readiness to make changes to their home and lifestyle. It shows that there is widespread awareness around net zero but limited understanding, with 71% of the public agreeing that it was the right thing to do once it had been explained.

It also found that 54% doubt that the UK will meet net zero by 2050, with 19% of the view that the UK will never reach net zero. While 51% of respondents said that higher energy prices made them more likely to look at “installing energy efficiency products” in the next 12 months, only 14% said they would choose a heat pump to replace their existing boiler. British Gas also announced that it is launching a new Net Zero business unit, focused on supporting customers in the journey to net zero.

**Benchmark power curve:** Comprehensive market and asset-level power price forecast.



A comprehensive power curve forecast across all key technologies, detailing price capture and power price trends. The Benchmark power curve provides central, high and low scenarios out to 2050.

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# Europe

## IEA calls on governments across EU to reduce gas consumption

James Shaw, [j.shaw@cornwall-insight.com](mailto:j.shaw@cornwall-insight.com)

The International Energy Agency (IEA) published analysis on **3 November** identifying a gap of 30bcm (billion cubic metres) of natural gas during the key summer period for refilling gas storage sites across the EU in 2023.

The IEA's report examines the latest developments in European natural gas and electricity markets, along with global LNG markets, assessing the implications for the EU's gas balance in 2023 and 2024. It highlights that Russian natural gas deliveries to the EU Union by pipeline halved in the first ten months of 2022 compared with the same period in 2021 – a drop of 60bcm. It is expected that for the full duration of 2022, Russia's pipeline supplies are expected to decline by over 55% year-on-year, equivalent to a drop of 80bcm.

EU gas storage sites are at around 95% capacity – putting them 5% (5bcm) above their 5-year average. This has been facilitated through a combination of higher non-Russian gas imports and lower demand driven by unseasonably mild weather in October – which in turn has reduced gas demand from distribution networks by over 30% year-on-year, effectively delaying the start to the heating season in many European markets. The IEA highlights two further factors that have helped storage levels build in the form of 30bcm of Russian gas that was supplied to the EU via pipeline, and lower LNG imports by China due to its economic slowdown and COVID-19 related lockdowns. However, the report warns that these conditions might not be repeated in 2023.

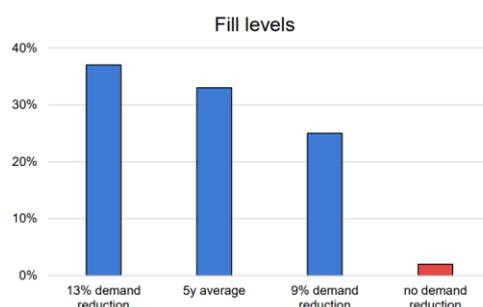
To this end, the IEA states that the cushion provided by the current mild temperatures, lower gas prices, and high storage levels should not lead to overly optimistic predictions into 2023 and beyond. It is highlighted that if Russian pipeline gas supplies to the EU are stopped completely and Chinese LNG imports recover to 2021 levels, the EU could face a supply-demand gap of 30bcm during the key summer period for refilling gas storage in 2023. This gap could represent almost half the gas required to fill storage sites to 95% capacity by the start of the 2023-24 heating season.

**Figure 1: IEA analysis of storage levels by the end of March 2023 and the resulting required injection volumes**

As part of the report, the IEA has considered various demand trajectories and how they translate into gas injection needs during the summer of 2023 (Figure 1). However, it is noted that a colder-than-average winter could deplete European storage levels faster, resulting in injection needs in the range of 80-90bcm.

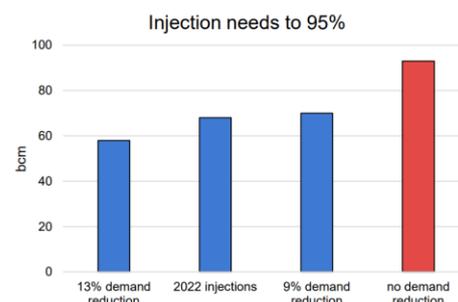
To address this, the IEA recommends a faster deployment of renewables, heat pumps, and energy efficiency measures in order to mitigate the risks of a worsening energy and gas crisis, delivered through the immediate action of governments.

**Potential EU and UK storage levels by end March 2023**



Source: IEA

**Resulting injection needs in summer 2023 to reach 95% fill level**



IEA Executive Director Fatih Birol said: “When we look at the latest trends and likely developments in global and European gas markets, we see that Europe is set to face an even sterner challenge next winter. This is why governments need to be taking immediate action to speed up improvements in energy efficiency and accelerate the deployment of renewables and heat pumps – and other steps to structurally reduce gas demand. This is essential for Europe's energy security, the wellbeing of its citizens and industries, and its clean energy transition.”

*Weather will be one of the drivers for how depleted gas storage levels will be as we emerge from the winter which will have impact on wholesale prices as well as pass to consumers.*

## EU Commission to invest €3bn in clean technology projects

The EU Commission announced on [3 November](#) that it has launched its third call for large-scale clean technology projects under the EU Innovation Fund – through which it will provide a total €3bn in funding. The commission states that a focus will be provided to projects that fall under the priorities of the [REPowerEU Plan](#), helping to end the EU's dependence on Russian fossil fuels. Funding will be split across the following categories:

- **General decarbonisation (€1bn)** – This will include projects in renewable energy, energy-intensive industries, energy storage or carbon capture, use, and storage, as well as products substituting carbon-intensive ones (notably low-carbon transport fuels, including for maritime and aviation).
- **Innovative electrification in industry and hydrogen (€1bn)** – The commission is seeking projects in electrification methods to replace fossil fuel use in industry as well as renewable hydrogen production or hydrogen uptake in industry.
- **Clean tech manufacturing (€0.7bn)** – The EU is looking for projects that will deliver the manufacturing of components as well as final equipment for electrolysers and fuel cells, renewable energy, energy storage, and heat pumps.
- **Mid-sized pilots (€0.3bn)** – This will cover projects in disruptive or breakthrough technologies in deep decarbonisation in all eligible sectors of the Innovation Fund.

Executive Vice-President Frans Timmermans said: “With this new call of € 3bn, the EU Innovation Fund will support even more clean tech projects than before, speeding up the replacement of fossil fuels in hard-to-decarbonise industries and accelerating the uptake of renewable hydrogen in the EU market.”

## Report examines expansion of biomethane and hydrogen production

The EU Agency for the Cooperation of Energy Regulators' (ACER) and the Council of European Energy Regulators' (CEER) 2021 Decarbonised Gases Volume of the Market Monitoring Report, published on [3 November](#), examines the current state of EU decarbonised gases and hydrogen and considers the challenges to expand production.

The report finds that the production of renewable and low carbon gases is currently modest when compared to future policy expectations but highlights that production goals have been accelerated as a result of the supply diversification efforts. Several challenges that may inhibit the expansion of this production include the need for improved infrastructure interconnections, greater end-use demand, and new infrastructure investments.

To address this, ACER and CEER make recommendations across a number of areas, including the need to define the quality of gases, the need to develop appropriate tariffing arrangements, and the identification of early phase technologies.

## SolarPower Europe calls on commission to increase renewables support

On [28 October](#), European solar trade association SolarPower Europe announced that it has written to the EU Commission concerning its views on the European Commission's [Non-Paper on Policy Options to Mitigate the Impact of Natural Gas Prices on Electricity Bills](#).

SolarPower Europe highlights that under the circumstances of the current energy price crisis it understands the need to cooperate with European decision makers around the regulation for a temporary revenue cap on renewable electricity revenues and a solidarity contribution from the oil and gas industries, along with providing its support for immediate measures to assist businesses and consumers.

However, the organisation warns against any rushed changes to the current rules of the European electricity markets stating that addressing the EU's reliance on imported fossil fuels should be achieved through the accelerated deployment of renewables and their efficient integration via storage or demand side response.

Fereidoon Sioshansi, Menlo Energy Economics

This article is from the November 2022 issue of *EEnergy Informer*, a newsletter edited by Fereidoon Sioshansi of [Menlo Energy Economics](#) and editor of Variable Generation, Flexible Demand.

### The benefits of turning *prosumers* into *flexumers* is overwhelming

By now, millions of customers, large and small, have installed rooftop solar panels and have reduced the number of kWhs they buy from the grid while saving on their electricity bills. There are some 2.5mn of them currently in the US, over 3mn in Australia, an amazing number. As time goes on and the cost of batteries drops, many of the same *prosumers* are making additional investment in batteries to store some of the excess generation for use after sunset.

Many are motivated by the ability of the battery to maintain critical loads during outages. Surveys in both the US and Australia suggest that an increasing number of customers interested to install solar panels are now pairing them with battery storage systems from the outset. But what is the economics of the behind-the-meter solar-plus-energy storage systems or solar photovoltaic and energy storage systems (PVESS)? Do they provide cost savings and can they maintain critical services during power outages?

As it happens, a new report by the Lawrence Berkeley National Laboratory (LBL) examines the performance of PVESS in providing critical-load or whole-building backup power in different regions, building types, and power outage scenarios. The study also considers long-duration – greater than 24-hour – power outages and evaluates how PVESS could provide backup power during such events.

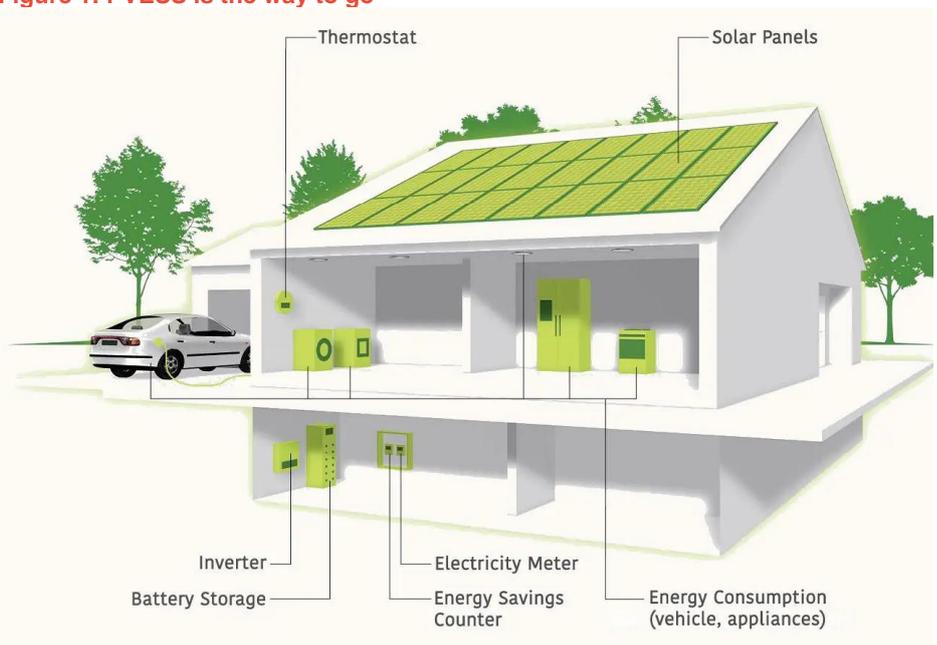
The short answer is that *it depends* on the installed capacity of the PV panels, the size and characteristics of the storage device and how many critical loads are to be served by the PVESS and for how long. Not surprisingly, the LBL study suggests that for both residential and commercial buildings:

- Providing backup power to limited critical loads and without heating/cooling *can generally be achieved* with a relatively small PVESS; while.
- Providing *backup to heating and cooling loads can be challenging* – i.e., it will be expensive – with small battery systems.

The evidence in the market suggests that most *prosumers* install batteries primarily to better match their generation with consumption – by storing the excess generation during the sunny hours of the day for use after the sunset. Serving essential loads during short power outages is a secondary objective for most.

A recent study by Bruce Mountain and Ben Willey at the Victoria Energy Policy Center reported in the *Renew Economy* on 20 September 2022 suggests that solar panels plus behind-the-meter (BTM) battery systems can be a money maker for many households by taking advantage of arbitrage opportunities

Figure 1: PVESS is the way to go



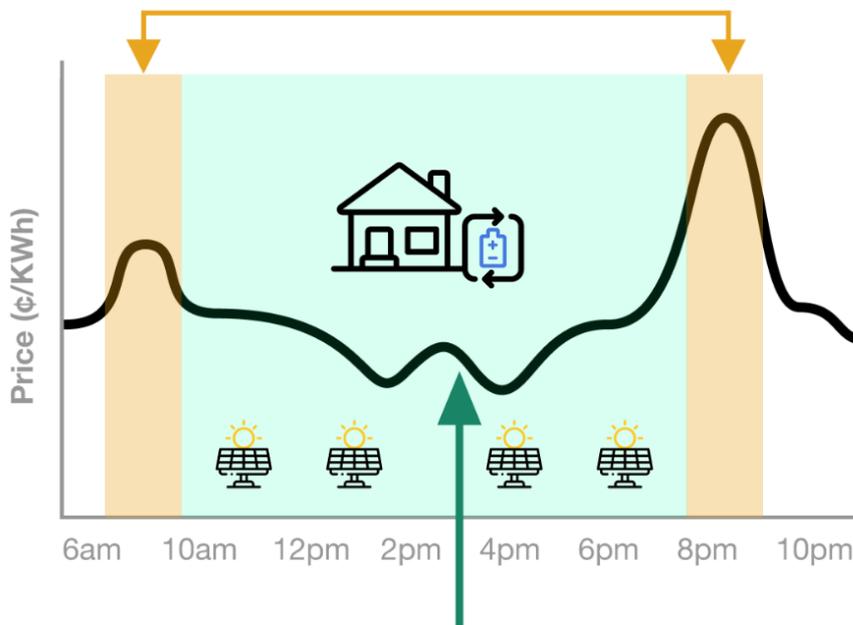
available on the wholesale and retail markets in Australia.

Commenting on the latest research, Bruce Mountain, Director of the Victoria Energy Policy Center in Melbourne, Australia said,

“We found being able to participate in the wholesale electricity market made a good deal of difference to storage income. There are evidently powerful incentives for this. Entrepreneurial Australia developers are offering technology and retail supply solutions to ensure customers can benefit. Very exciting development.”

Moreover, the empirical evidence from the Australian market, which has the highest per capita penetration of rooftop solar in the world, suggests that owners of PVESS may have strong motivations to take control of their BTM investments, optimising how much gets generated, stored and consumed. Which explains why new enterprises such as Amber (Figure 2) are emerging with tools and software that allows PVESS owners to take charge of their devices while optimizing and monetising their performance.

Figure 2: Amber shows how PVESS works



Source: Amber

The pace of developments and innovations taking place in the BTM space is simply hard to keep track of. Not surprisingly, many retailers and distribution companies are now getting into the act by taking advantage of the opportunities to aggregate large numbers of participating customers with PVESS into schemes that allows win-win-win outcomes.

In many cases, the retailers/suppliers are offering attractive incentives for qualifying customers to install PVESS by subsidising the investment or, in some cases, essentially giving away the systems with no upfront cost provided that the customers agree to stick around for a few years and allow their BTM gadgets to be remotely monitored, managed and essentially operated as a virtual power plant (VPP). The benefits of turning inflexible passive loads into active and flexible resources deliver net value for the participants and the retailers while reducing congestion and costs on the distribution grid.

Turning *prosumagers* into *flexumers*, those with flexible demand, makes them valuable participants in the retail market. As it is often said, what is there not to like?

## Upcoming forum

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# Wholesale

# Market

## Gas

Day-ahead gas rose 74.4% to 109.00p/th, following the introduction of colder weather after a notably warmer October, encouraging higher domestic heating demand and increased reliance on more expensive forms of generation to meet demand such as gas-fired plant. However, December 22 gas was down 15.0% at 301.00p/th, and January 23 gas decreased 8.3% to 336.50p/th. Q123 gas also moved 11.5% lower to 340.00p/th. All seasonal gas contracts declined last week, down by 7.1% on average, a potential response to the strong booked volumes of LNG reaching UK and European terminals, easing some of the future gas supply concerns in the medium-term and reducing the level of risk previously being baked into longer-dated contracts. Both summer 23 and winter 23 gas dropped 9.2% and 11.1% respectively, subsiding to 295.00p/th and 313.00p/th.

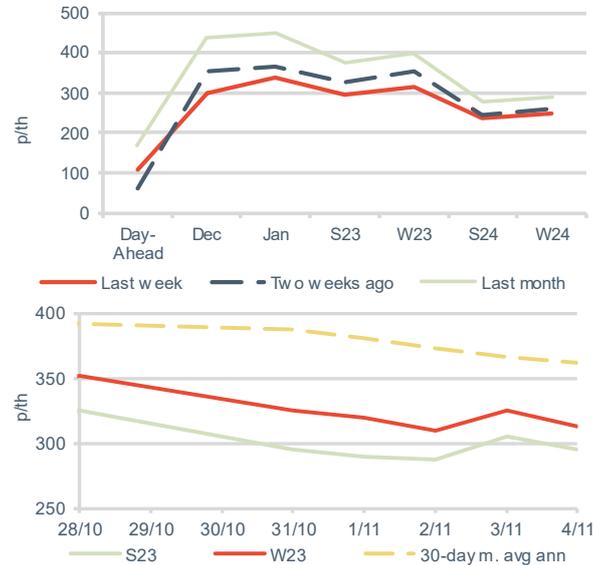
## Electricity

Day-ahead power rose 10.5% to £105.00/MWh, following the marked gains of its equivalent gas contract, along with higher carbon prices and lowering wind output as the week matured. However, December 22 power slipped 11.1% at £335.00/MWh, and January 23 power fell 7.3% to £675.00/MWh. Q123 power also moved 4.0% lower to £555.00/MWh. Like gas, all seasonal power contracts declined last week, down on average by 5.9%. Summer 23 power decreased 10.0% to £270.00/MWh, while winter 23 fell 4.8% to £300.00/MWh. The annual April 23 contract lost 7.3% to £285.00/MWh, which was 14.9% lower than the same time last month (£335.00/MWh), and 258.5% higher than the same time last year (£79.50/MWh).

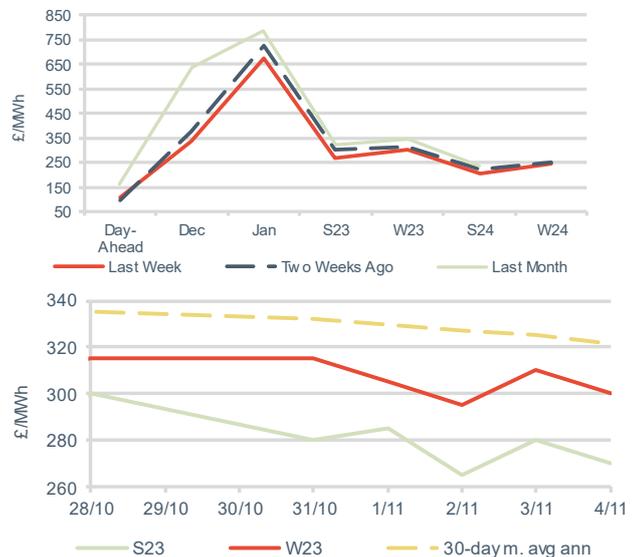
## Oil, UK and EU ETS carbon

Brent crude prices climbed 1.1% to average \$95.12/bl, a second consecutive week of gains. The 2mn/bpd cuts from 1 November introduced by OPEC+ was the main driver for the gains. Elsewhere, reports have emerged that the G7 and Australia have agreed to set a fixed rate price when they ultimately finalise a price cap on Russia oil (expected to be later in November). EU and UK ETS prices saw collective bullish movements this week. EU ETS rose 4.0% to average €78.06/t, whilst UK ETS carbon increased 0.5% to £75.33/t.

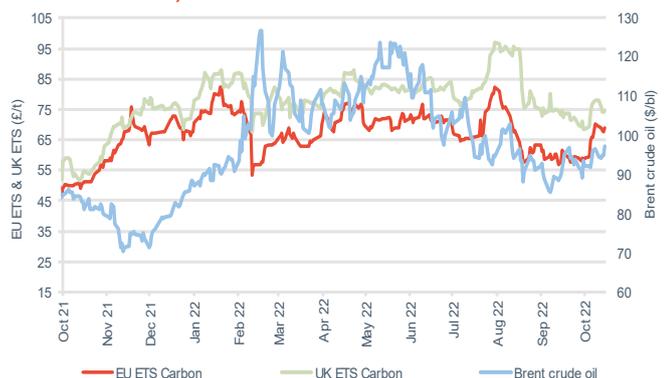
Gas forward curve (top) and seasonal contract movements (bottom) – prices taken 04 November 2022



Power forward curve (top) and seasonal contract movements (bottom) – prices taken 04 October 2022



Brent crude oil, UK ETS & EU ETS Carbon



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