

Insight Paper

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# Unlocking net zero strategies for business

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## About Cornwall Insight

Getting to grips with the intricacies embedded in energy and water markets can be a daunting task. There is a wealth of information online to help you keep up to date with the latest developments but finding what you are looking for and understanding the impact for your business can be tough. That's where Cornwall Insight comes in, providing independent and objective expertise. You can ensure your business stays ahead of the game by taking advantage of our:

- Publications – Covering the full breadth of the GB energy industry, our reports and publications will help you keep pace with the fast moving, complex and multi-faceted markets by collating all the “must-know” developments and breaking-down complex topics
- Market research and insight – Providing you with comprehensive appraisals of the energy landscape helping you track, understand and respond to industry developments; effectively budget for fluctuating costs and charges; and understand the best route to market for your power
- Training, events and forums – From new starters to industry veterans, our training courses will ensure your team has the right knowledge and skills to support your business growth ambitions
- Consultancy – Energy market knowledge and expertise utilised to provide you with a deep insight to help you prove your business strategies are viable

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# About Shoosmiths

[Shoosmiths LLP](#) is a major UK law firm with 1,000+ lawyers operating from 13 locations across England, Scotland and Northern Ireland. The firm advises UK and international organisations on achieving their strategic goals and prides itself on delivering highly complex, high-profile transactions for clients. Clients include entrepreneurs and high net worth individuals; fast-growth companies and SMEs through to FTSE 250 businesses as well as financial advisers and institutional sponsors.

Clients are offered strength and depth in all the core disciplines, together with key specialisms and deep sector expertise. Energy & Infrastructure is a focus sector for the firm with a strong team of dedicated advisers ideally placed to support clients on projects in these fields. In particular the team has extensive experience of advising developers, investors, funders and other stakeholders on a wide range of renewable and clean energy projects, including solar PV, onshore wind, hydrogen, waste-to-energy, biofuel and hydro projects.

Clients say Shoosmiths get the 'people bit' right, never take a client for granted, and invest in the relationships which are at the heart of great service. Shoosmiths was named National Firm of the Year at The Lawyer Awards 2019 and has been shortlisted for the 2021 award later this month.

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# Foreword



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This report is being issued during COP26, the climate summit in Glasgow, when governments across the world are making their net zero commitments in a bid to tackle the challenge of limiting global warming.

Governments naturally have a leading role to play here – through their policies, through the setting of targets and by driving the behaviours of companies and individuals. In the build up to COP26 the term ‘net zero’ has become more widely known and understood, and has found its way up the agendas of many company boards.

Companies have a duty – both legally and morally – to take measures in relation to limiting global warming. Moreover, there is an increasing commercial imperative – with potentially serious consequences from a commercial perspective if they do not act. While the rising consumer demand for cleaner and more eco-friendly products and services is a factor, it is the rapidly growing number of public bodies and companies setting out their own net zero commitments – and consequently looking to reduce their greenhouse gas emissions through their supply chains – that will truly accelerate change. If companies don’t get on board with reducing emissions, they are

likely to find their customers are soon demanding that they do so.

While the net zero challenge is one we all face, organisations are in different situations and start from different positions. There is no one-size fits all approach.

Companies need to look at their own specific circumstances – their energy use and requirements and how that might be reduced, how they source that energy and what options they may have for clean energy generation or enabling such generation. They also need to think beyond their own operations and consider their suppliers and the wider market. What opportunities do they have to work with other businesses – vertically, horizontally or geographically – in order to achieve net zero?

We hope this Cornwall Insight report goes some way to help organisations think through these complex issues.

It provides information, ideas and inspiration to businesses to act, and identifies ways that these actions can be implemented – all the while being realistic as to the challenges. In it we have shared the experiences of businesses at different stages of their net zero journey and through these demonstrate the importance of developing and implementing an ambitious net zero strategy that employees, stakeholders and customers can buy into, as well as the need to have a strategy that can adapt and be kept up to date.

There are companies and other organisations currently making bold statements about their net zero ambitions and their successes so far. That’s great – it’s absolutely in all our interests that they are successful in meeting their targets. But don’t let those organisations with strong, public positions on net zero put you off speaking out about what steps you are taking. It is OK to be at different stages of this journey. While it is important what you have done, it is even more important what you are going to do and when you are going to do it.

# Executive summary

Aligning to the UK government's net zero by 2050 ambition, an increasing number of businesses are looking to reduce their emissions and become sustainable organisations. Consumer and investor pressures are also leading many companies to set more aggressive targets for net zero implementation before 2050, with some targeting this decade. For many businesses, setting a target is the easy part but achieving net zero creates complexity across sectors, technologies and various business structures. This report explores the potential routes to decarbonisation that businesses have at their disposal and includes several overarching messages:

**Pressure for businesses to adopt net zero is both bottom up and top down** — The key drivers for businesses to make net zero commitments are investor pressure and legal and regulatory requirements, particularly for large corporates. Societal pressure and customer expectations of businesses to do right by the environment and climate act as bottom-up drivers. The net zero journey provides opportunities for businesses to show leadership in their solutions and pathways to tackle climate change.

**Successful, sustainable approaches will be shaped by location, scale and exposure to different vectors. Best practice sharing and cooperation may unlock faster progress** — There is no 'one-size-fits-all' strategy for businesses to achieve net zero and there will be different options for different businesses. Collaboration and partnership with other companies and organisations as well as stakeholders, investors, customers and suppliers is key to achieving net zero. It will also require larger companies and industries to support their supply chains and SMEs in their net zero journeys.

**Green supply is attractive but beware of greenwashing** — Choosing a green electricity supply can be a straightforward way for a business to decarbonise their energy supply and boost their environmental, social and governance (ESG) credentials. However not all green electricity tariffs and products are as 'green' as companies are led to believe. The governance of green tariffs therefore needs to be reviewed to ensure net zero is embedded in all business energy supplier operations.

**On-site generation works for businesses with physical space and access to up-front capital** — For businesses where on-site generation is suitable, they can benefit from reductions to carbon emissions and energy costs and ensure a long-term stability of supply.

**Corporate PPAs are for credit worthy businesses, but the market is ripe for innovative partnerships** — The CPPA market needs to expand and evolve to allow the potential for smaller corporates to club together to deliver a bankable offtake solution.

**Demand side response (DSR) has more to offer, but energy efficiency is an untapped opportunity** — While DSR has helped energy intensive industries to reduce costs and meet their net zero goals, solutions need be explored to make it more accessible for all corporates. More also needs to be done to improve energy efficiency as it can be one of the most cost-effective mechanisms for businesses to decarbonise and reduce their energy bills.

**Businesses need to be assertive and proactive** — Ideas on net zero strategies and best practice need to be shared and businesses need to seize the opportunity to make a positive impact. Achieving net zero is not the finish line, companies need to maintain net zero and even go beyond that to become net positive.

Further detailed findings are:

- Policymakers, investors and consumers are increasingly exerting pressure on corporates to ensure the latter embark on their net zero journeys and incorporate ESG considerations into their strategies.
  - These plans should not be seen by companies as a mere box-ticking exercise, but as opportunities to show leadership by devising genuine solutions and clear pathways to tackle climate change and environmental degradation.
  - The sheer volume of national and international standards and initiatives to support companies achieve net zero can sometimes lead to confusion and limit comparability. For systemic change to be enabled, it would be useful to achieve a degree of simplification of existing schemes.

- Each business – depending on its type and size – has different options available to reach net zero. Each corporate needs to embark on an honest appraisal of where it is on its net zero journey, explore the multiple available solutions and make appropriate decisions.
  - Basic actions include developing awareness by understanding and communicating the benefits of net zero across the business, followed by setting measurable targets. These measures then need to cascade down the company from corporate objectives to each individual's KPIs.
  - Solutions may be relatively easy to identify for sole occupancy office-based firms, as their priority is the decarbonisation of their power consumption. Similarly, organisations with large vehicle fleets are likely to identify battery electric vehicles (BEVs) or fuel cell electric vehicles (FCEVs) as low hanging fruits.
  - Targets are much more challenging for hard-to-abate sectors such as heavy industry, aviation and shipping. Some companies in these sectors will not be able to reach their targets without carbon offsetting, which will require the development and adoption of suitable accounting procedures.
  - Some organisations, such as vertically integrated companies, have more control over the different facets of their targets. Those that are not vertically integrated face an additional set of challenges as they have to rely on the actions conducted by their business suppliers.
- A coordinated whole-system approach is key to reaching net zero. Governments are usually focused on the short term but reaching net zero by 2050 requires a very different approach. At the very least, government should provide a stable and certain regulatory environment, providing the investment certainty needed for the private sector to be able to make long-term investment decisions.
- There appears to be only a minority of companies that are confident to speak publicly about their net zero targets and strategies, with a lot of hesitancy across the business community. However, the majority of organisations need to be proactive and assertive about their net zero targets and strategies, so they can lead by action, share best practice and seize the opportunity to make a positive impact.
  - Partnering with other companies and organisations is key to developing a holistic net zero strategy that fits the requirement of each business and market sector.
- Non-domestic consumers are increasingly interested in sourcing green electricity to meet expectations from stakeholders, investors and customers as part of their corporate social responsibility and commitment to meeting net zero targets.
  - 'Green' electricity tariffs based on Renewable Energy Guarantees of Origin (REGO) certificates can be a straightforward and often cost-effective step for businesses to decarbonise.
  - There are growing concerns over the actual greenness of these tariffs and over the practice of 'greenwashing'. As such, the governance of green tariffs needs to be thoroughly reviewed to ensure net zero targets are firmly embedded in the operations of all business energy suppliers.
  - Although renewable energy is becoming progressively more cost-competitive with fossil fuel-based sources, in some cases the cost of green products has been a barrier for businesses, especially for small and medium enterprises (SMEs).
  - Whilst most, if not all, companies are keen on decarbonising their energy consumption, also for brand reputation reasons, increases in bottom line costs are clearly an obstacle.
  - Technological scaling-up is set to bring down the cost of hydrogen and carbon capture, utilisation and storage (CCUS) as has already happened in the case of solar and wind energy, demand of clean energy is also set to go up.
  - It needs to be ensured, therefore, that green tariffs are always cheaper than conventional options. Green premiums need to disappear as polluting options need always to be disincentivised with appropriate price signals such as carbon taxes.
- DSR where corporates are financially incentivised to increase or decrease their energy use to provide flexibility to the grid as and when it needs it, has been helping energy intensive industries to reduce costs and meet their net zero goals.

- Although DSR has not been economically viable for smaller companies and sites, solutions should be explored to make it more widely accessible.
- Artificial intelligence (AI), machine learning and advanced data modelling have pivotal roles to play in helping businesses reach their targets.
- Although significant progress has been achieved in decarbonising electricity generation, more needs to be done in sectors such as mobility and heat. In particular, energy efficiency is the elephant in the room yet to be addressed properly. Requirements for new builds are important but, since the vast majority of the UK's existing building stock is hugely energy inefficient, holistic solutions are necessary.
  - Heating, lighting, office equipment and, where applicable, factory and warehouse equipment, are often the main areas where businesses can make energy efficiency improvements. Synergies among different organisations should be explored to meet common objectives.
  - Although there are a number of economic, organisational and behavioural barriers to be addressed, improvements in energy efficiency can be one of the most cost-effective mechanisms for businesses to reduce their energy bills and carbon emissions.
  - Different options to decarbonise heat need to be considered depending on corporate requirements, including heat networks and heat pumps.
- On-site generation, where an organisation generates its own electricity at its own site without the reliance on buying energy from the grid, can greatly help businesses reduce their carbon emissions and energy costs, and ensure their long-term stability of supply.
  - On-site generation is not only seen as greener than REGO certificates, but it also insulates businesses from network and transmission charges, as well as from wholesale market volatility. Moreover, there are various models for asset ownership, meaning businesses can find a solution which suits their size and purpose.
  - Land availability is key: while investing in on-site generation has some clear advantages, not all businesses have sites available for the development of generation assets. What is more, it is not always easy for corporates to commit to large-scale capital investment, particularly when finances are tight. There is potential for external financing, which can not only take it off the corporate's balance sheet, but also deliver all of the funding for immediate rollout rather than the corporate having to spread the investment.
  - Even for organisations that do have capital available as well as spare land or roofs for wind or solar assets, it is not always easy to draft compelling business cases for the development of generation assets. Also in this case, partnerships and collaboration are key to properly assessing costs and benefits and to make informed decisions. In some cases, government funding and support is available to cover the costs of producing the business cases and provide direct advice and support to corporates. For example, the Heat Networks Delivery Unit provided grant funding and guidance to local authorities in England and Wales for heat network project development.
- Organisations can use Corporate Power Purchase Agreements (CPPAs) to purchase renewable energy directly from a renewable energy generator.
  - While buyers of CPPAs still tend to be generally large creditworthy companies that have made corporate social responsibility commitments, the market needs to expand, with potential for smaller corporates to club together or piggy-back to deliver a bankable offtake solution.
  - The supply for corporate PPAs is set to exceed demand.
- Overall, there is an urgent need for collaboration among businesses, as net zero cannot be achieved in isolation. The involvement of stakeholders, by actively engaging with investors, customers and suppliers, is essential.
  - There is definitely an important role for larger companies and industries to help provide information to the SMEs they work with on net zero and on managing their carbon footprints.
- The journey should not end at net zero—businesses need to maintain net zero, be proactive and become net positive companies.



# 1. Chapter 1: The net zero backdrop

## 1.1. Background to net zero

Net zero refers to the point at which the amount of greenhouse gases (GHG) generated is no more than the amount taken away. To achieve this balance by 2050, countries have committed to limit global warming to well below two degrees. Ideally, 1.5°C, compared to pre-industrial levels. This commitment is a key part of the Paris Agreement — a legally binding international treaty on climate change — adopted by 196 parties at COP21 in December 2015. In June 2019, the UK became the first major economy to pass national laws to reduce all GHG emissions to net zero by 2050<sup>1</sup>. This was followed by a law to reduce emissions by 78% by 2035 compared to 1990 levels<sup>2</sup>.

Critically, achieving this requires actions from across the economy. The government's Energy White Paper<sup>3</sup>, published in 2020, helps to illustrate what steps need to be taken to transition to net zero. It highlights changes such as reducing emissions, transitioning to electric vehicles, switching to cleaner fuels such as hydrogen for heat, power and industrial processes. It also cites the use of clean electricity and smart technologies. It is estimated that measures set out in the Energy White Paper could reduce emissions across power, industry and buildings by up to 230MtCO<sub>2</sub>e in the period to 2032.

The three 'Scopes' defined in the Greenhouse Gas Protocol provide an internationally recognised framework for outlining the action required of businesses in reducing emissions. Reporting of Scope 1 and 2 emissions is mandatory for many organisations worldwide and relates to systems within the reasonable control of an entity, such as on-site and purchased energy. Scope 3 emissions are voluntary to report and are harder to monitor as they involve emissions relating to a wide variety of sources across a business's supply chain.

To aid the progress of UK businesses in reducing their emissions, the government has committed to supporting the investment and deployment of essential low carbon technologies and has assisted companies with the costs of improving energy efficiency in existing assets. It has also introduced schemes to help businesses achieve targets, which we will explore in more depth in the following section.

## 1.2. Schemes to help businesses achieve targets

Many different schemes have been set up to help businesses set and achieve net zero and carbon-neutral goals. Some of these include:

- **Science Based Targets Initiative (SBTi)** — independently assesses and approves companies' targets according to its criteria. Targets are considered 'science-based' if they are in line with what the latest climate science judges necessary to meet the goals of the Paris Agreement. At the end of October 2021, the SBTi launched its 'Net Zero Standard' – the world's first framework for corporate net zero target setting in line with climate science, providing guidance and tools companies need to set solid science-based net zero targets.
- **Race to Zero** — a global campaign to gather leadership and support from businesses, cities, regions, and investors for a zero-carbon recovery. It mobilises a coalition of net zero initiatives representing over 730 cities, over 30 regions, over 3,000 businesses, over 170 investors and over 620 higher education institutes in an alliance committed to achieving net zero carbon emissions by 2050 at the latest.

### Scope 1, 2 and 3 emissions

A company's GHG emissions can be classified into three scopes according to the Greenhouse Gas Protocol Corporate Standard:

**Scope 1:** emissions directly from owned or controlled sources.

**Scope 2:** indirect emissions from the generation of purchased energy.

**Scope 3:** indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.

*Purchase of gas and on-site gas consumption/burning is Scope 1, while the purchase of electricity is Scope 2.*

<sup>1</sup> [UK becomes first major economy to pass net zero emissions law - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/news/uk-becomes-first-major-economy-to-pass-net-zero-emissions-law)

<sup>2</sup> [UK enshrines new target in law to slash emissions by 78% by 2035 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-percent-by-2035)

<sup>3</sup> [Energy White Paper \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/87111/energy-white-paper.pdf)

- **SME Climate Hub** — an International Chamber of Commerce initiative, Exponential Roadmap Initiative and We Mean Business Coalition and the United Nations Race to Zero campaign. It aims to curate tools and resources to address the needs of small and medium-sized enterprises (SMEs) with collaboration from the Net Zero team at Oxford University. The commitment involves cutting carbon emissions in half by 2030 and reaching net zero by 2050.
- **Carbon Neutrality Standard, PAS 2060** — an internationally recognised carbon neutrality standard which was published by the British Standards Institution in 2010. The certification demonstrates an organisation is committed to decarbonisation and neutralising the remaining impact through supporting environmental projects.
- **B Corp Climate Collective** — Certified B corporations (B Corps) are businesses that meet the “highest standards” of verified social and environmental performance, public transparency and legal accountability to balance profit and purpose.
- **RE100** — a campaign for businesses committed to sourcing 100% renewable electricity. It is led by The Climate Group in partnership with CDP<sup>4</sup> and is an initiative bringing together influential businesses from around the world committed to 100% renewable electricity.
- **The Climate Pledge** — co-founded by Amazon and Global Optimism in 2019 and calls on signatories to reach net zero carbon emissions by 2040.
- **BRC Climate Action Roadmap** — a campaign in which the retail industry has committed to take science-based action to limit the global temperature rise to 1.5°C above pre-industrial levels. The roadmap’s supporters have committed to working with other retailers, suppliers, government, and stakeholders to collectively achieve net zero in the UK retail industry by 2040. The industry aims for retailers’ electricity use to be net zero by 2030 and its fuel for gas and refrigerant use to be net zero by 2035. It also targets retailers to work with industry partners for all products sold in the UK to be net zero by 2040.
- **Regional initiatives** — such as the West Midlands Net Zero Business Pledge for businesses in the West Midlands to commit to reducing carbon emissions, working with others, and becoming ambassadors to achieve a regional net zero carbon economy by 2041.

These initiatives are important because they provide a degree of certainty for investors and stakeholders, offer a benchmark for companies in terms of progress and provide a verifiable demonstration of decarbonisation activity. However, some flaws have been highlighted by industry participants. The large number of schemes can make it challenging for companies to decide which one to subscribe to. There is also a risk that some companies could pick and choose which method they use for measuring, depending on which is easier and gives the ‘best’ result. There are further concerns that these risks would be exacerbated when applying such schemes in the developing world, where UK businesses often have critical elements of their supply chains.

Moreover, as we progress towards net zero, unique challenges will arise, and the pledges and schemes put forward may struggle to cope with the level of granularity required. As Archie Lasseter, Sustainability Lead at Utilita, commented, “the schemes have their place, but they’re not the complete answer”.

### 1.3. Understanding the drivers of net zero commitment

There are many different drivers for businesses to make net zero commitments and set targets. Whilst many drivers might apply to all corporates, some drivers will depend on the type and size of the company. These include legal and regulatory requirements, societal pressures as well as investor and customer expectations. The impact of these factors varies across the globe, but the pressure from each direction remains high for many businesses in the UK and other European countries. There is an acknowledgement that those drivers could be positive for businesses.

#### Legal requirements

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<sup>4</sup> A not-for-profit charity that runs the global disclosure system for investors, companies, cities, states, and regions to manage their environmental impacts.

There are increasingly specific legal requirements for companies with regard to net zero. Reporting against the Task Force on Climate-related Financial Disclosures (TCFD) recommendations is compulsory for premium listed companies, which includes reporting Scope 1 and Scope 2 emissions for accounting periods beginning on or after 1 January 2021. There is also a move to promote reporting Scope 3 emissions. In addition, requirements were introduced from 1 April 2019 for quoted and large unquoted companies and Limited Liability Partnerships to report additional energy and GHG emissions as part of the Streamlined Energy and Carbon Reporting (SECR) framework. BEIS has also confirmed that from 6 April 2022, over 1,300 of the largest UK-registered companies and financial institutions will be mandated to disclose climate-related financial information in line with recommendations from the TCFD.

UK pension law has changed so that trustees of pension funds are now required to consider environmental, social and governance (ESG) factors when setting their statement of investment principles. This shift has ushered in a requirement for a more holistic investment approach, as trustees need to disclose their policies with asset managers, demonstrating how they incentivise managers to make investment decisions based on assessments of medium to long-term non-financial performance. “That means they’re taking that seriously and putting pressure on fund managers who then put pressure on the companies they’re investing in,” commented Adam Forsyth, Head of Longspur Capital Markets and Head of Research at Longspur Capital.

### **Environmental, Social and Corporate Governance (ESG)**

Various regulations cover different aspects of ESG that they must comply with depending on a company’s size, scope, and sector. Whilst the majority of ESG reporting is not mandatory, some elements are. These include GHG reporting, which is mandatory for quoted companies under the Companies Act 2006 and energy use, whereby quoted companies are to report on their global energy use and large businesses are to report their annual UK energy use and GHG emissions under the Companies (Directors’ Report) and Limited Liability Partnerships (Energy and Carbon Report) Regulations 2018. With the government signalling mandatory ESG reporting, some companies are voluntarily adopting frameworks and implementing processes that will enable them to report across a broader range of metrics.

### **Political**

Particularly in the public sector, there will be political pressures for net zero targets to be made mandatory. Nigel Evans, Director at West Mercia Energy, explained that “within the public sector, it is important to show a lead and do the right thing”.

### **Sector-level targets**

Some sectors will have specific sector targets to encourage businesses within that sector to follow suit. For example, one interviewee highlighted that Water UK had set targets to be net zero by 2030. This drives companies within the water industry, in this instance, to also commit to these targets.

### **Corporate opportunity**

Some businesses, rather than being compliance-driven, see net zero as also delivering public relations (PR) and marketing benefits. The public profile of a business usually drives this as climate change reaches a high point in public perception. Some customers appear to be voting with their feet regarding a company’s net zero credentials. It can also be driven by the nature of the purchase being made, whether it is a luxury good or a necessary purchase.

Interviewees in our research warned of the importance of developing stricter frameworks to ensure consumers know the validity of corporate net zero efforts. Yue Jin Tay, Director of Business Development at sustainable supply chain traceability provider, Circular, commented that “the tendency to cut corners to do something to be able to say you’ve done something big can be a lot more tempting than actually making a meaningful impact.”

Other corporate benefits of net zero commitments cited by our interviewees included lowering staff turnover. This is particularly pertinent now and in the near future as a new younger generation of workers increasingly seek to contribute positively to the issue of climate change. It also aids recruitment, making businesses a more attractive place to work.

Finally, increased opportunities for efficiencies in the supply of products was also raised as a corporate benefit for motivating low-carbon business practices. “These are ultimately good drivers for businesses,” said one interviewee.

## Peer pressure

There is a sense of peer pressure among corporates to meet net zero, particularly competitor companies. Henrietta Stock, Energy and Carbon Manager at SES Water, highlighted, “between industries and between companies in an industry [...] you get to a point where a critical mass of companies in the industry is [incorporating net zero commitments] and therefore everybody's going to do it”.

## Climate change impacts

For some companies, the actual impacts, and risks of what climate change might bring to their business can be a concern. This is particularly important to companies with physical assets, for instance, utility companies or housing companies. Henrietta Stock (SES Water) noted that her company in the water industry is “having to adapt to climate change, and we're having to do a lot of work around adaptation plans”. She added that, given the visible impacts of climate change across the world, they are then driven to “be more ambitious in what we're trying to do to reduce our emissions”.

### 1.3.1. Are current business targets achievable?

As of 31 March 2021, almost one-third of the UK's largest businesses (FTSE 100 companies) had signed up to the UN's Race to Zero campaign<sup>5</sup>, and in July 2021, it was reported that 70 FTSE 100 companies had made a net zero pledge. There are concerns, however, around the credibility of some targets and of greenwashing. Adam Forsyth (Longspur Capital) highlighted variation in commitments noting that some companies “are [decarbonising] in a more genuine way of proper additionality and change and others are moving chess pieces around”.

With regards to accessibility, a survey of 1,000 businesses conducted by the British Chamber of Commerce in August 2021<sup>6</sup> found that the main barriers to businesses becoming more sustainable were high upfront adaptation costs (34%) and a lack of finance (30%). Getting access to grants (28%), tax allowances (14%) and reducing the cost of adaptations (14%) were the areas businesses want to see to help them reduce carbon consumption. Responses to this survey revealed that 27% of larger firms had set targets to reduce emissions, compared to 9% of microbusinesses.

Another study by Accenture and IHS Markit UK Business Outlook surveyed 1,400 companies across the UK and found that manufacturers were the least confident about hitting their targets (34%) due to practicality. Meanwhile, of service providers, the most confident group of businesses surveyed, 40% thought their goals were deliverable. Of those with set targets, 45% have goals to be net zero by 2030 and one third by 2025. Of the companies that had not set formal targets, there was the opinion that decarbonisation progress was being made, with solar PV installations and electrification of company vehicle fleets being the most common actions<sup>7</sup>.

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<sup>5</sup> [Third of UK's biggest companies commit to net zero - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/news/third-of-uk-s-biggest-companies-commit-to-net-zero)

<sup>6</sup> [Carbon footprint a mystery to 9 out of 10 small businesses \(britishchambers.org.uk\)](https://www.britishchambers.org.uk/news/carbon-footprint-a-mystery-to-9-out-of-10-small-businesses)

<sup>7</sup> [Only 15% of UK businesses have set a net zero target - future Net Zero](https://www.britishchambers.org.uk/news/only-15-of-uk-businesses-have-set-a-net-zero-target-future-net-zero)

## 2. Chapter 2: Routes to decarbonisation – tariffs and technology

### 2.1. Understanding green supplier tariffs for businesses

Non-domestic consumers are increasingly looking at sourcing green electricity to meet expectations from stakeholders, such as investors and customers, as part of their corporate social responsibility and net zero targets. With regards to major government contracts, the government has published new procurement requirements requiring bidders to demonstrate they have carbon reduction plans in place.

Business energy suppliers market green electricity tariffs as being backed by energy produced solely from renewable sources, such as onshore and offshore wind, solar, hydro and biomass. In most cases, electricity is supplied from the transmission grid, into which generation from all sources is fed. Therefore, green electricity tariffs, work by having an energy supplier “match” the energy consumed by their customers with energy generated from renewable sources on an annualised basis. This is done using Renewable Energy Guarantees of Origin (REGO) certificates which show the origin of each MWh of energy generated from eligible renewable sources and other attributes including generation station location. Green electricity tariffs can therefore be a straightforward step for businesses to decarbonise.

Some energy suppliers have invested in their own renewable generation sites in the UK, whilst the majority of these energy suppliers have power purchase agreements (PPAs) in place with independent UK renewable generators. Cornwall Insight analysis indicates 42% of business energy suppliers match all the power customers use to renewable generation they own or buy from in the UK, 11% of business energy suppliers match over half but not all their customers’ power. In comparison, 47% of business energy suppliers match under half.

There are numerous green electricity tariffs available to businesses. For many energy suppliers, these tariffs are backed by REGOs or Guarantees of Origin (GoO)—European version of REGOs -, whilst some source power from “independent” renewable generators in the UK and others will have a mix of their own renewable generation, PPAs and REGOS. There are also several energy suppliers offering renewable tariffs for all business customers, whilst for some, the “green” tariffs/products may not be available for all business sizes.

Regarding gas tariffs, some suppliers offer carbon-neutral gas where the gas has been offset or provide green gas from “green gas mills” or through the REGO scheme. The government is currently consulting on options for assisting with the cost reduction of biogas tariffs.

There are, however, concerns over the transparency of “green” tariffs, which is referred to as “greenwashing”. One controversial aspect is the extent to which a consumer may be misinformed as to the environmental benefit of their energy choices. As we transition to clean power, BEIS<sup>8</sup> considers it imperative that green electricity tariffs evolve to reflect our system’s changing needs, driven by the net zero target. Archie Lasseter (Utilita) agreed that a huge rework of green tariff governance needs to happen in order to make them truly net zero.

**REGOs** provide transparency to consumers about the proportion of electricity that suppliers source from renewable generation.

One REGO certificate is issued per MWh of eligible renewable output to generations of renewable electricity.

The certificate proves to the final customer that a given share of energy was from renewable sources.

The primary use of REGOs in GB is for fuel mix disclosure which discloses to potential and existing customers the mix of fuels used to generate the electricity supplied.

<sup>8</sup> [Designing a Framework for Transparency of Carbon Content in Energy Products \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/90442/designing-a-framework-for-transparency-of-carbon-content-in-energy-products.pdf)

## 2.1.1. Costs and benefits of green tariffs for businesses

There are many benefits for businesses to opt for a green electricity tariff/product. These include:

- It is a simple way for a business to become “greener” and meet its sustainability and renewable energy goals and reduce Scope 1 and 2 emissions.
- Businesses will reduce their carbon impact by choosing a green tariff. For example, Bulb states that its average business customer lowers its carbon impact by 5.4 tonnes of CO<sub>2</sub> a year — the hard work of around 2,702 trees.
- With some suppliers, a business would get a green tariff at no extra cost to a “standard” tariff, or all of the supplier’s tariffs might be 100% renewable.
- Customers often expect businesses to make ethical decisions, so choosing a renewable tariff is good for marketing and has the potential to attract more custom, business partners, investment, and employees.

Some energy suppliers will have little or no premium at all for renewable tariffs, though others will. Premiums in 2021 have been up to 0.20p/kWh for green electricity and up to 0.75p/kWh for green gas for some suppliers. Cornwall Insight’s SME Price Analysis for August 2021 shows the prices for some suppliers offering ‘green’ electricity as standard for a profile class of four users with an annual consumption of 40MWh (Figure 1). The premiums some suppliers have on their ‘green’ tariffs compared to their ‘standard’ products (Figure 2). Adam Forsyth (Longspur Capital) believes that “these products won’t come at a premium in time as the cost curves are going the right way”.

**Figure 1: SME electricity prices for suppliers offering ‘green’ electricity as standard**

	PC 4 40MWh
Haven Power	19.74p/kWh
Opus Energy	18.01p/kWh
E.ON UK	16.40p/kWh

Source: Cornwall Insight (Delivered prices the SME customer pays minus any commission, VAT and Climate Change Levy (CCL))

**Figure 1: Premiums on SME supplier’s ‘green’ tariffs compared to non-green products**

	Green premium
ENGIE	0.0p/kWh
Corona	0.20p/kWh
SSE	0.10p/kWh

Source: Cornwall Insight (Delivered prices the SME customer pays minus any commission, VAT and CCL). Note SSE now offers “green” electricity as standard.

As we move closer to net zero by 2050, the green option has to become the cheaper option, according to Archie Lasseter (Utilita). Developments in technology will bring down some of these costs, but the demand for REGOs has gone up. Three years ago, REGOs cost single-digit pence – 5/6p/MWh. Now they are at £1.60 and expected to go up. They were an easy way to become green, so people have latched onto them, and now there is high demand, which will support more renewables, but there is a lag in how quickly renewable generation can be built to meet the demand. While an increase in the demand of REGOs could theoretically boost the competition and therefore drive down prices, this does not seem to be happening at the moment. As it is a growing market, it is difficult to gauge what will happen in the long-term.

For some, particularly smaller businesses, the cost premium of green products will be a barrier to them choosing green energy, particularly where margins are tight. However, James Wood-Robertson, Partner at Shoosmiths, believes that buying ‘green’ energy is the very least a business should be doing. He added that financially it might be a barrier and an additional cost, but “I don’t think it’s a cost that they can afford not to incur” as we transition to a net zero world.

## 2.2. Demand side response

DSR is where businesses are financially incentivised to increase or decrease their energy use to provide flexibility to the grid as and when it needs it. In other words, it is about using energy intelligently. This helps to ensure the electricity system is secure, sustainable, and affordable. It also reduces the cost of system balancing and facilitates the integration of variable generation sources like wind and solar. It, therefore, helps to flatten the peaks and troughs in demand. Typical processes that will get turned down to respond do not impact day-to-day business operations, such as lighting, air conditioning, electric heating, pumps, and other non-essential equipment. However, businesses can also be incentivised to use excess energy from the grid, for example, when there is lots of wind on the system.

### DSR for smaller businesses

Flexitricity is trialling a new DSR development in the form of its Quickturn project, which has received £0.5mn funding from BEIS.

It will provide an opportunity for smaller commercial energy users across Britain to benefit from DSR.

Traditionally, energy-intensive industries have been the main focus of DSR as it has not been economically viable for smaller sites due to the cost of hardware, communications, and implementation. Typically, 500kW represents the lower end of the scale to make DSR economic<sup>9</sup>.

DSR can help save on total energy costs by avoiding higher energy prices during peak demand and reducing businesses' carbon footprint. National Grid ESO believes that DSR has a vital role in the evolution of the electricity market and that security of supply is improved by enabling everyone to make better use of alternative energy sources<sup>10</sup>.

## 2.3. Using energy efficiency to reduce emissions

Energy efficiency is the “absolute elephant in the room”, according to James Wood-Robertson (Shoosmiths). Whilst we have made good progress towards decarbonising the electricity grid and increasing renewable generation, there are still “huge issues” related to heat and transport decarbonisation. Adam Forsyth (Longspur Capital) highlighted the fall in energy demand over the past 15 or so years, attributing it to improvements in energy efficiency. While he said a lot of the low hanging fruit in terms of energy efficiency actions has gone, Longspur Capital estimate that energy efficiency could form 20% of the net zero solution from a 2015 emissions perspective. Therefore, energy efficiency has an essential role in decarbonisation and, without it, demand for electricity will rise. While technological change is a primary aspect in improving energy efficiency and reducing energy consumption, it also requires behavioural changes.

Energy efficiency can be a nice entry into a green perspective for a business to focus on. However, it can't be something that is done in isolation. It has to be done alongside other actions as part a business' wider net zero strategy. Improving energy efficiency within a business will reduce energy consumption and help towards decarbonisation. It will also save money in the energy savings that companies are making.

Many businesses can achieve meaningful cost savings through a reduction in energy consumption. Even low and no-cost actions can usually reduce energy costs by at least 10% and produce quick returns and increase profitability. Cutting energy costs by 20% represents the same bottom-line benefit as a 5% increase in sales in many businesses, according to the Carbon Trust.<sup>11</sup> Heating, lighting, office equipment and where applicable, factory and warehouse equipment are often the main areas where efficiency can be improved. Some companies follow an avoid, reduce, offset, or mitigate strategy in their operations.

Benefits of increasing energy efficiency include:<sup>12</sup>

- Increased profitability
- Ability to win new contracts, especially with the public sector
- Attracting and retaining the right quality of staff

<sup>9</sup> [Zero Waste Scotland](#)

<sup>10</sup> [National Grid ESO](#)

<sup>11</sup> [Carbon Trust](#)

<sup>12</sup> [SME Guide to Energy Efficiency \(gov.uk\)](#)

- A more comfortable working environment
- Reduced energy bills that can be used to fund new jobs
- Increased competitiveness
- Increased profitability
- Improved green credentials
- Reduced exposure to future energy price rises
- Improved cash flow
- Wider benefits to society from reduced carbon emissions and improvements in air quality

In a non-domestic building, heating typically accounts for up to 40% of the energy used. It is, therefore, a key target area when considering energy-saving measures as there is a wide array of efficient options. For every 1°C of overheating, heating costs can rise by around 8%<sup>13</sup>. Sufficient lighting is important and relevant to every business. For many, it can be one of the most energy-intensive parts of the business and can contribute up to 40% of a building's electricity use. Regarding office equipment, 46% of electricity in businesses is used outside of standard operating hours<sup>14</sup>, for example by leaving monitors on or vending machines keeping items unnecessarily cool at night. Leaving equipment on standby with a red light on can cost around £1/year for every watt of power used.<sup>15</sup>

However, while improving energy efficiency can be one of the most cost-effective mechanisms to reduce businesses' energy bills and carbon emissions, interviewees observed that a lack of information and upfront capital costs of installation can deter small businesses. Particularly in measures such as insulation and energy management systems. Other challenges include barriers within the organisation regarding decision-making, interventions not being profitable enough and lack of behavioural change and interest.

Around half of all energy consumed in commercial and industrial buildings in England and Wales is in the rented sector. There may be some restrictions on the type of measures that these businesses can put in place. However, the Energy White Paper, however, sets out plans to tighten minimum standards for this sector to reach energy performance certificate (EPC) Band B by 2030 were cost-effective. It has also proposed a performance-based rating scheme for large commercial and industrial buildings to provide businesses and their investors with more information on reducing energy consumption and lower carbon emissions and energy bills.

For larger businesses, there are lots of energy efficiency funds, like Triple Point and SDCL, targeting energy efficiency measures within businesses, including through the management of government-backed funds such as the Mayor of London's Energy Efficiency Fund (MEEF) managed by Amber Infrastructure.

## 2.4. Smart appliances

Businesses can use smart technology for many different purposes, including remotely monitoring appliances to improve performance and predict potential problems. It can also manage, monitor, optimise and reduce energy usage and thus lower daily operating costs. The main examples of smart appliances to reduce energy consumption and increase energy efficiency are:

- Smart heating, ventilation, and air conditioning (HVAC) via a smart thermostat, which can use wireless technology to communicate with other smart devices and sensors in the business.
- Smart windows which automatically regulate a building's energy efficiency, light transmission, and thermal responsiveness.<sup>16</sup>
- Smart lighting uses motion detectors to turn lights off when spaces are not in use or remotely control dimmer switches.
- Remote appliance management can improve energy efficiency and performance and predict potential problems.

It is the ability to monitor and control energy use that businesses often lack, leading to inefficiency. Akshat Gupta, Group EV Infrastructure and Propositions Manager at Volkswagen Group UK, described automation

<sup>13</sup> [Carbon Trust](#)

<sup>14</sup> [SME Guide to Energy Efficiency \(publishing.service.gov.uk\)](#)

<sup>15</sup> [SME Guide to Energy Efficiency \(publishing.service.gov.uk\)](#)

<sup>16</sup> [iGlass Technology](#)



as “the pinnacle of energy efficiency”. Smart technology can help identify where efficiencies can be made and also help a business manage that efficiency improvement. For some companies, such as some of those in the water sector, there is a lack of data and control systems to be able to optimise processes automatically. However, Henrietta Stock (SES Water) said there is scope for this to happen and expects there to be the technological changes in the next few years to allow it.

James Wood-Robertson (Shoosmiths) spoke of the potential for smart appliances in businesses as being “huge” and shared the idea of having a system or community area with businesses, properties, services, and people together, with smart technology determining when and how energy is used. What is more, a decentralised energy system can supply all properties involved, so they operate symbiotically as an efficient unit. He added that it should be the ambition to spread that symbiosis out across a larger community or city.

## 2.5. Lowering carbon footprint in heat

Direct GHG emissions from buildings were 87 MtCO<sub>2e</sub> in 2019, around 17% of the UK total<sup>17</sup>. These emissions were primarily the result of fossil fuels for heating<sup>18</sup>, with commercial and public buildings accounting for 23% of this. The pandemic (2020-2021) will have seen the overall demand for heating in businesses drop. However, as we see economies recovering and COVID-19 restrictions ease, the challenge remains to shift non-domestic heating to renewable sources. This transformation will require a careful balance between the speed and breadth of transition and the costs to businesses. Indeed, the price volatility of energy during the UK’s recent ‘energy squeeze’ has brought the importance of cost stabilisation into sharp relief. The development of technology will play a key role in supporting this balancing act.

### 2.5.1. Policy for non-domestic heating

In the UK, the non-domestic Renewable Heat Incentive had, until it closed for applications in April 2021<sup>19</sup>, been a popular direct policy tool encouraging the uptake of renewable technologies for heating in businesses, public and non-profit organisations, shifting costs of installation over time. From autumn 2021, applications for the Green Gas Support Scheme (GGSS) will open in England, Scotland, and Wales. The scheme will run for four years and is more targeted in technology type<sup>20</sup>.

Looking forward, there are a number of different targets that set ambitions for expanding the growth of other technologies. This includes a commitment to grow the installation of electric heat pumps from 30,000 per year to 600,000 per year by 2028 in the UK<sup>21</sup>, as well as plans for a Hydrogen Neighbourhood trial by 2023 and a large Hydrogen town trial by 2030<sup>22</sup>, with strategic decisions to be taken in 2026<sup>23</sup>. Policy support for these developments is less specifically outlined at present, but the plans help shape expectations for the future of low carbon heat in the UK. The government is also consulting<sup>24</sup> on ending the installation of high-carbon fossil fuels to heat non-domestic businesses not connected to the gas grid from 2024.

**Heat networks** are distributional systems of insulated pipes that take heat from a central source and deliver it to several buildings in a given area. Heat networks can supply a building, business, or an entire city. There are a number of possible heat sources for such networks, including a combined heat and power plant, heat recovered from industry, geothermal sources, or energy from waste plants. This variety in uses and sources of energy make them a versatile, enabling solution to heat decarbonisation.

### 2.5.2. Heat networks

Currently, around 2% of heat provision is through heat networks<sup>25</sup>, with demand for non-domestic heat

<sup>17</sup> [Sector-summary-Buildings.pdf \(theccc.org.uk\)](#)

<sup>18</sup> Ibidem

<sup>19</sup> [Non-Domestic Renewable Heat Incentive \(RHI\) | Ofgem](#)

<sup>20</sup> [Green Gas Support Scheme and Green Gas Levy | Ofgem](#)

<sup>21</sup> [The Ten Point Plan for a Green Industrial Revolution \(HTML version\) - GOV.UK \(www.gov.uk\)](#)

<sup>22</sup> [The Ten Point Plan for a Green Industrial Revolution \(HTML version\) - GOV.UK \(www.gov.uk\)](#)

<sup>23</sup> [Heat and Buildings Strategy \(www.gov.uk\)](#)

<sup>24</sup> [Phasing out the installation of fossil fuel heating systems in businesses and public buildings off the gas grid \(www.gov.uk\)](#)

<sup>25</sup> [Opportunity areas for district heating networks in the UK \(publishing.service.gov.uk\)](#)

pumps highest in Scotland, London and the North East<sup>26</sup>. The Climate Change Committee estimates that around 18% of UK heat will need to come from heat networks by 2050 if the UK is to meet its carbon targets cost effectively<sup>27</sup>. Non-domestic buildings are often ideal for the switch to heat networks as they are mostly concentrated in urban areas with a higher heat density, where heat networks are more likely to be deployed. Historically, heat sources have included fossil-fuel reliant options such as coal and oil. Looking forward, for heat pumps to provide a feasible option for net zero these sources will have to shift either to recycled forms of energy, such as recovered waste heat, geothermal heat, or large biomass<sup>28</sup>.

The Scottish Government has introduced a District Heating Relief that provides a discount of up to 50% on rates for non-domestic premises used for District Heating and which will be in place until 2032. On 8 October, BEIS announced seeks views on a proposed approach to deliver heat network zoning in England and identify areas where heat networks are the most appropriate solution for decarbonising heating.

### 2.5.3. Electrification of heat in businesses and heat pumps

There are some technological variations of heat pumps depending on the energy source. This includes air source, water source and ground source heat pumps. Each variation has advantages and disadvantages related to the cost, safety and excavation level required to install it. All heat pumps have high upfront costs, with air and water heat pumps costing between £5,000 to £8,000 in 2020 and ground source heat pumps costing around £13,000<sup>29</sup>. Heat pumps can also be connected to a series of businesses, for instance, in a business park or campus, via a shared ground loop. This can reduce costs as heat pump boreholes are shared in a given area. Despite the large upfront costs, there are efficiency and financial benefits for businesses that adopt them. Heat pumps maintain efficiency levels for around 25 years, more than double the average boiler<sup>30</sup>. However, the government set out its ambition in the Heat and Buildings Strategy<sup>31</sup> to reduce the costs of installing heat pumps by at least 25-50% by 2025.

**Heat pumps** are systems that move heat from one area to another. This process of recovering and reusing heat makes it a useful option for decarbonising heating.

### 2.5.4. Role of hydrogen in heat

There is little clarity on the expectation for hydrogen's use in heating for businesses in the future<sup>32</sup>. In August 2021, the government published its hydrogen strategy listing the key uses for hydrogen in a net zero future. The paper primarily focused hydrogen in transport and industry. Still, it remained ambiguous about hydrogen's role in the heating sector, with the 2035 demand ranging from 0TWh to 45TWh (10% of space heating demand). Hydrogen in heat may also be more suited to specific cities or regions where the existing gas pipe network can accommodate hydrogen being blended in the natural gas supply.

### 2.5.5. Biomass for heat

The final option for consideration in decarbonised heating for businesses is biomass, combustible plant or other organic matter to produce a 'green gas' called biogas. For example, businesses could produce biogas on-site through the installation of biomass boilers, which burn down the matter to convert into hot air and gas which can then be passed through the central heating system<sup>1</sup>. The GGSS seeks to encourage companies of all sizes to produce green gas by providing a financial incentive for the injection of green gas onto the grid. This will be particularly for those companies that have ample natural waste products such as in agriculture.

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<sup>26</sup> Ibidem

<sup>27</sup> [Heat networks - GOV.UK \(www.gov.uk\)](https://www.gov.uk)

<sup>28</sup> [Heat Networks in the UK v5 web single pages.pdf \(theade.co.uk\)](https://theade.co.uk)

<sup>29</sup> [A Guide to Heat Pump Prices in 2020 | The Renewable Energy Hub](https://www.renewableenergyhub.org)

<sup>30</sup> [5 benefits of Commercial Heat Pumps for businesses | Ground Sun](https://www.groundsun.co.uk)

<sup>31</sup> [Heat and Buildings Strategy \(gov.uk\)](https://www.gov.uk)

<sup>32</sup> [H21 | About H21](https://www.gov.uk)

# 3. Chapter 3: Routes to decarbonisation – generation

## 3.1. Direct asset involvement at on-site/private wire generation

On-site generation is where energy is produced at the point of use. It is also known as decentralised energy because an organisation can generate its own electricity at its own site without purchasing energy from the grid. A private wire arrangement is where a generation asset is connected via dedicated infrastructure to customer demand. The private wire links demand and generation are located on different sites. It is similar to 'behind the meter' arrangements but requires the construction of a dedicated link.

### Benefits of on-site/private wire generation

- Reduced carbon emissions and energy costs (compared with electricity imported from the grid)
- Safeguards against price fluctuations
- Increased stability of supply/ energy certainty
- Improves reputation and sustainability credibility
- Allows for integration with other low-carbon technologies such as energy storage or electric vehicles
- Offers potential revenue opportunities where surplus energy can be sold back to the grid, especially at times of system stress
- Revenue can also be gained from the Capacity Market (CM) and green certificates
- Asset(s) can be used to avoid the most expensive import electricity times
- Availability of various models for asset ownership/operation

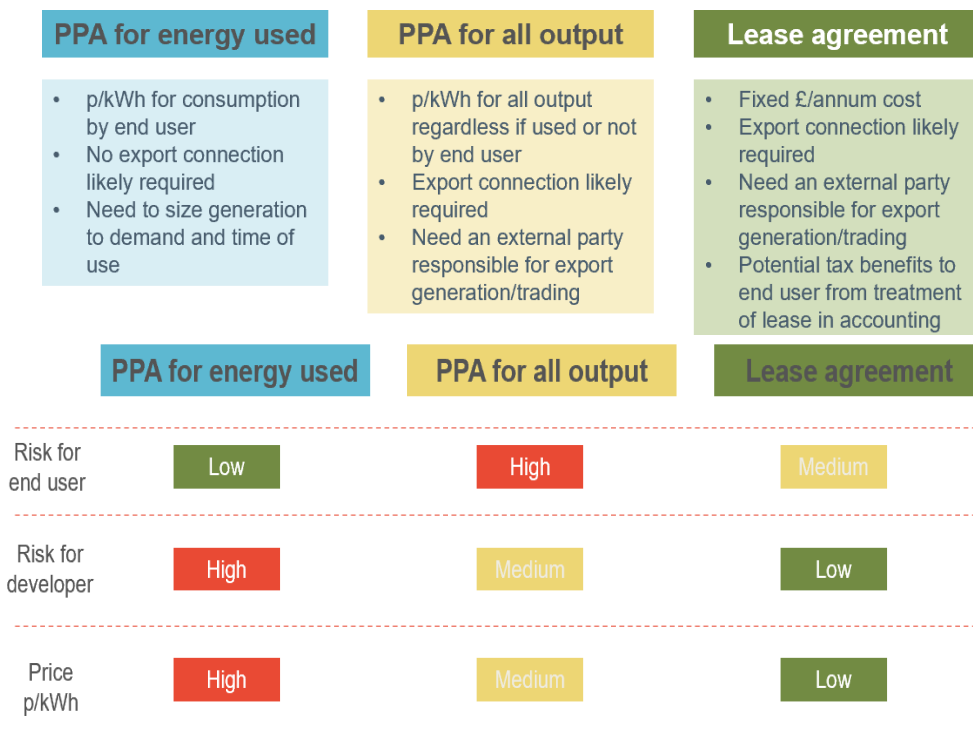
While the benefits can be abundant, there are necessary considerations for businesses when opting for private wire generation:

- **Sizing**
  - Businesses need to ensure close matching to consumer/ end-demand and be aware that a power purchase agreement (PPA) contract may still be needed for unused volumes.
- **Revenue streams**
  - If more value is in peak avoidance, then dispatchable technologies are better suited rather than solar or wind.
  - A more static demand profile may benefit from solar or wind output.
- **Ownership models**
  - An owner/operator model can be more straightforward but rare.
  - They typically have leasing agreements, and there is potential for rental models with shared income.
- **Longevity**
  - With regards to the end-user, the length of the contract and whether a rental agreement is easier.
  - In terms of revenue streams, certainty over network charging and balancing service revenues.

Similarly, the costs of private wire are unique to each set-up, the existing infrastructure, ground conditions, length and requirement for sub-station and other infrastructure. Costs can run into hundreds of thousands or more. A very rough rule of thumb is 100m of high voltage cable = £10k to £20k. What is more, CAPEX/OPEX is typically recovered from the end-user, which would need to consider the asset's depreciation.

Commercial agreements for private-wire generation include the capital costs of the generation asset and private wires; operating cost and maintenance; warranties; decommissioning; financing costs; and connection costs. If the end-user is willing to take on some of the risks, for example, by taking on the connection or asset beyond the 25-year lifetime, it will lower the £/MWh rate. Figure 3 shows the key different commercial options depending on generation and demand, as well as the risk appetite of the end-user and developer.

**Figure 3: Key commercial models for private wire generation and risk appetite**



On-site generation currently reduces a site's exposure to residual network charges and final consumption levies are avoided<sup>33</sup>. However, installing on-site generation via a private wire connection can mean the total cost of the unit rate is based on network charges, namely triads and p/kWh Distribution Use of System (DUoS) charges.

However, as policy costs are expected to move away from the electricity bill, this could reduce the value of on-site generation cost avoidance. In addition, ongoing network charging reforms<sup>34</sup> could also reduce the value of on-site generation due to residual costs moving to a fixed charging basis.

Source: Cornwall Insight

<sup>33</sup> Renewables Obligation (RO), Feed-in Tariff (FiT), Contract for Difference (CfD) and the CM.

<sup>34</sup> Targeted Charging Review (TCR)

**Figure 4: Avoidable power market costs in relation to on-site/private wire generation**

Wholesale energy	Network	Final consumption levies	Other (tax, metering etc.)
Largest element of user's bill (~40-70%) Typical contract is 1-3 years Large users may have 'flexi' contracts to manage price movement Non-locational	Around 10-30% of a user's bill Large cost range between peak/off-peak Location sensitive Undergoing large reform Upward trend for infrastructure and balancing costs	10-20% of user's bill Fairly predictable costs for end-user Non-locational Most are passed through with commodity Growing debate around appropriateness of collection	Includes CCL, VAT (although larger users will be exempt from the full rate of CCL), small (relatively fixed) costs associated with metering
Within-day and annual peak	Peak demand (TNUoS annual, DUoS daily, BSUoS on volume) <sup>35</sup>	Volume – most on annual basis (FiT quarterly) Capacity Market – annual peak	CCL on volume Metering fixed charge Supplier costs combination of volume/fixed
Unregulated	Regulated	Unregulated	Unregulated

Source: Cornwall Insight

In 2019, two-thirds of businesses were generating more than 10% of their energy on-site, and 30% of businesses generating energy on-site were selling it back to the grid<sup>36</sup>. A survey by npower business solutions<sup>37</sup> of over 50 businesses from manufacturing, transport and the public sector found that over 50% of respondents had already invested or were planning to invest in their own renewable energy technology.

**npower business solutions survey**

**On-site technology options**

- Solar PV was the most common technology installed, with 77% of respondents saying they had already invested in solar PV for their business, whilst the second most common technology installed was combined heat and power (CHP) by 38% of respondents.
- Solar PV was also the most common choice for businesses planning to invest in on-site generation.

**Funding challenges**

- While 65% of the business respondents said they fund energy efficiency or sustainability initiatives from within the business, npower found the CAPEX can be tough.
  - The most common barriers are proving the return of investment of an on-site asset (43%) and access to funding (40%).
  - With some technologies having paybacks over several years, some businesses find it hard to justify major capital investments when finances are tight.

**Site suitability**

- Many businesses do not have the sites suitable for such on-site generation, with a quarter of respondents questioning their site's suitability.
  - Where on-site generation is not feasible due to cost or site suitability, businesses can use PPAs to purchase renewable energy from a local renewable energy source or use them to avoid the need for upfront investment – 73% of those who could not install on-site generation said they had already or were considering PPAs.

<sup>35</sup> Transmission Network Use of System charges (TNUoS), Distribution Use of System charges (DUoS), Balancing Services Use of System charges (Buss)

<sup>36</sup> [Distributed Energy Future Trends | Centrica Business Solutions](#)

<sup>37</sup> [Your Road to Net Zero \(npowerbusinesssolutions.com\)](#)

One of the barriers to the uptake of low carbon technologies such as heat pumps and electric vehicles is that electricity costs are currently around four to five times the cost of gas. Henrietta Stock (SES Water) commented that businesses with solar are “quite happy” because they forgo the need to purchase from the wholesale market. She explains that such certainty is especially valuable for “when [prices] are really volatile or really high, like now”. Since power prices are very high at the moment, on-site generation may enable businesses to have greater control over their costs. Still, interviewees observed that it's not always easy to do private wires. For instance, where businesses set up a long term PPA and then undergoes substantial change, a PPA contract might not be appropriate.

From an economic point of view, Adam Forsyth (Longspur Capital) agrees that “on-site generation gets control of [a business’s] decarbonisation agenda”. He cautioned, however, that it is site-dependent and company-specific. He added, “for a lot of people [a behind-the-meter solution] is just not going to be appropriate”. Similarly, Archie Lasseter (Utilita) noted that “the business model depends on what you can afford as a business”. Rooftop space and land availability are some of the site characteristics that can support or inhibit the development of on-site generation. Lasseter explained that community energy schemes could present opportunities for businesses to collaborate – and collectively address – such limitations.

On-site generation is viewed by some as more environmentally friendly than REGOs. Nigel Evans (West Mercia Energy) agrees that businesses seeking increased additionality and traceability can create their own generation assets. However, Henrietta Stock (SES Water) added that for most businesses, the development of on-site generation “is beyond the margins of what they do”. Stock explained that preparing a business case to understand the true costs and benefits of an installation is not necessarily easy or straightforward to do.

### 3.2. Additionalities and cost/benefits of CPPA options

Typically, there are three ways a generator can earn income from a generation asset in the GB market.

1. Trade power on the market yourself by having a supply and generation licence to comply with rules.
2. Become a supplier and sell energy directly to consumers (vertically integrated model).
3. Find a buyer through a PPA or a tolling agreement.

Option three includes the majority of generation assets that are in the market. Cornwall Insight research shows that out of 45GW of renewable power in GB, two-thirds of it are under a third-party PPA. It is a popular route to market because of the simplicity and lower barriers to entry in comparison to the alternatives. PPAs have therefore been a cornerstone for renewable assets.

#### Drivers of interest in CPPAs

- Corporate social responsibility
- No upfront capital requirements
- Long-term wholesale price certainty/hedges against price volatility
- Potential opportunity to negotiate lower rates when purchasing (offtaking) a significant proportion of a site’s output
- To meet/match demand requirements
- Internal public renewables/low-carbon targets
- Government-led targets
- Growing experience of developers/utilities

In effect, a PPA is a long-term legal contract between two parties often used to underwrite investment. Typically, it includes direct and clear language around who takes what risk in the contract, parameters of payment and the terms and conditions surrounding the deal. PPAs have relatively standard terms across the market. Now though, there are several standard auction systems and platforms where PPAs can be arranged, which makes it easier for parties such as local authorities.

A corporate PPA or CPPA is an energy supply contract between a generator and an end-user. Similarly, it will set out pre-agreed volumes, contract length and price, which will be bespoke on a case-by-case basis. The energy is delivered over the public network, so the negotiations are, essentially about fixing the wholesale cost element of the end bill. Typically, all the output is from a single generator, and contracts are generally five years and above. The corporate end-user remains liable for network and policy costs through the associated supplier. The involvement of a supplier is solely to fulfil the need for a licensed party to take on any top-up and spill requirements and for balancing supply and demand.

CPPAs are not new. What is new is the use of them to support debt-financed subsidy-free assets. The structure of a CPPA is similar to a utility PPA. CPPAs do, however, contain more detail and conditions around shaping, imbalance, forecasting and the 'what-ifs' around generation/supply imbalances. While the market is expected to grow, it lacks the scale to meet renewables targets on its own. The market is an evolving environment in GB regarding to network charging, and power price cannibalisation presents challenges for uptake. The CPPA signing process can be lengthy as well as complex and can take six months to two years to conclude.

What is more, demand from corporates for green power is restricted to creditworthy corporates able to progress lengthy

contracts. James Wood-Robertson (Shoosmiths) explains that "only about 15% of companies in the UK have a balance sheet strong enough to meet the credit requirements of developers, investors and funders". He adds, "[CPPAs] are part of the solution for big [not small] business". However, he noted potential opportunities for small businesses to "club together". Archie Lasseter (Utilita) observed a tendency for generators to want to sell all of an asset's output to one business. He explained, "that's the nice neat and tidy option", but "there needs to be a market whereby an SME or a not very large corporate can buy a chunk of power in a CPPA". He foresees one solution "a middle organisation" bears the risk by buying the power and then selling it on to corporates. Alternatively, virtual PPAs<sup>38</sup> were mentioned by one interviewee who considered these to be "very popular in the US and on the continent". Regulatory and tax issues were identified as potential barriers to the use of virtual CPPAs in the UK and a desire amongst many corporate offtakers (renewable energy purchasers) to demonstrate additionality through a physical CPPA.

Although, suppliers primarily use REGOs to prove to customers that they are 'green' through fuel mix disclosures, corporates can also use them as well to prove 'greenness'. CPPAs, however, do bring additionality compared to buying a REGO backed 'green' electricity supply and enable corporates to fulfil corporate social responsibility objectives. REGOs are increasingly being priced into CPPAs at around 20p-80p/REGO. Hydro, wind and solar-renewable technology usually sees higher REGO prices, whilst landfill gas, energy from waste and biomass assets will see lower REGOs. CPPAs can offer green solutions to companies that are not renewable generators themselves or are limited by site characteristics.

#### **CPPA deals with Scottish Power and EDF**

On 31 October 2020, Scottish Power announced it had begun work on 80MW of onshore wind projects that will supply Tesco and Amazon under CPPAs.

- A 50MW windfarm on Kintyre Peninsular will supply Amazon.
- A 30MW windfarm in Halsary, Caithness, will supply Tesco.
- Merchant projects built on land owned by Forestry and Land Scotland.

On 28 October 2020, Tesco also announced a deal with EDF for three PPAs for onshore wind and rooftop solar.

- A 10.8MW Burnfoot East Windfarm and an unnamed 43MW plant will supply Tesco.
- EDF also installed solar panels on 17 Tesco store rooftops in England for a total capacity of 5MW.
- Tesco Group set a target to source 65% of its electricity from renewables by 2020 and 100% by 2030.

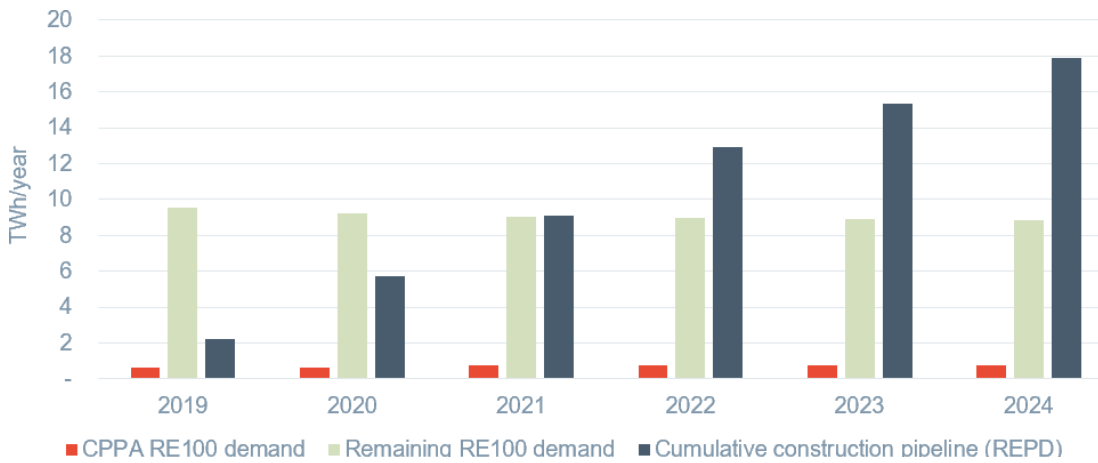
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<sup>38</sup> Virtual PPAs have the same financial contract that is associated with a physical PPA, but it is a 'financial swap' contract that doesn't involve the physical delivery of electricity.

Up to 2020 there was around 1.4TWh of generation under a form of CPPA in GB, most of which is subsidised assets under the Renewables Obligation scheme. During 2020-21, there has been ~1.2TWh of CPPAs signed with a trend for subsidy-free. The wholesale price is the largest single element of a CPPA price and will depend on the view of the wholesale price at the time of agreement. A typical corporate electricity bill will be £90-£140/MWh, and the wholesale (negotiated) element is around 40% of this. However, there may be negotiations around the supplier fee as well. If the generation is off-grid (on-site or private wire) then the whole of the value chain can be negotiated.

According to Figure 5, generation is expected to outstrip demand. In a situation where more CPPAs are sought than can be catered for, corporates are likely to have relatively more bargaining power.

**Figure 5: Outlook for CPPAs**



Source: Cornwall Insight



# 4. Chapter 4: Way forward

## 4.1. What strategy should businesses take?

Our interviewees agreed that there is no single strategy for companies to achieve their net zero targets. Instead, it depends on the type and size of the business, and which solution is most appropriate for each business.

“What is needed is a full deep dive by the business to understand and be honest about where they are in their net zero journey. Businesses should be confident enough to not present or represent themselves in a way that makes it look like they’re doing more or better than they are, and instead address each of the challenges they have identified,” said James Wood-Robertson (Shoosmiths).

For example, a sizeable fleet company will have to consider mobility decarbonisation through battery electric vehicles (BEVs) or fuel cell electric vehicles (FCEVs). Overall, there is no ‘one-size-fits-all’ solution, as each company needs to be offered a suitable mix of solutions to achieve net zero. Each organisation’s net zero journey will look different from all others, depending on its type and size.

For companies getting closer to their net zero targets, the law of diminishing returns applies. Making the big initial changes will be easier and quicker, while carrying out the final, marginal actions will be harder. Some organisations, however, will find it easier to achieve net zero targets, and some in the harder to abate sectors may find it more difficult. Those organisations that can reach net zero more easily should also consider whether net zero is ambitious enough.

### 4.1.1. What tactical steps should businesses take?

Based on our conversations and research, the key steps for a business to take to reach net zero are:

- 1) Understand the current carbon footprint
  - Businesses need to analyse their current emissions and energy use to identify the areas where their carbon footprint needs to be reduced.
- 2) Get internal buy-in
  - The most ESG-conscious leaders within the organisation need to raise awareness and communicate net zero benefits across the business, highlighting potential benefits ranging from attracting new investors and customers, retaining staff, and boosting brand reputation.
- 3) Set corporate targets
  - Management needs to devise clear, ambitious yet realistic net zero pathways, learning from best industry practices but tailored to each corporate based on its size, type, and sector. These objectives need to flow down the organisation, being embedded in the KPIs of each individual.
- 4) Choose the measures to be implemented and develop a framework to measure the carbon footprint
  - Devise a detailed framework and methodology to address carbon footprint, environmental degradation, and other related ESG targets. Include specific and measurable interim targets, based on cost-benefit analysis, to which the company will be accountable internally and externally.
- 5) Engage staff and create momentum
  - Launch internally corporate net zero targets, ensuring staff engagement around these objectives through forums and events. Appoint net zero champions and create momentum so that this initiative is not a tick-boxing exercise but an act of collective empowerment.
- 6) Go public and assess progress periodically

- Engage with investors, customers, and suppliers. Learn from constructive criticism and further refine the framework. Assess progress on a regular basis. As regulation and policy evolve and the market changes, recalibrate the framework and targets to ensure they are ambitious enough.

#### **4.1.2. And remember: it's a collective journey**

A coordinated whole system approach is key to reaching net zero. Governments tend to be focused on the short-term of the electoral cycle but achieving net zero by 2050 requires a holistic approach. At the very least, governments should provide a stable and specific regulatory environment, providing the private sector with the certainty needed to make long-term investment decisions. However, while policymakers have a key role in confidently coordinating change, all businesses have important responsibilities.

Often companies are so focused on their decarbonisation agenda that Scope 3 emissions of their supply chain are not included in their immediate priorities and actions. But there is definitely a role for bigger corporates and industries to support their business suppliers on net zero, engaging with them to help them manage their carbon footprints.

Instead of simply refusing to contract with suppliers unless the latter have an appropriate net zero strategy, large corporates can support these SMEs through technology transfers, by making financing available or providing educational resources. In other words, big businesses can lead by example, showing concrete decarbonisation paths to their suppliers with the goal of driving change. But if SMEs want to be properly supported, they need to be fully transparent about their practices without being cagey about their carbon footprints and environmental practices. An open dialogue is fundamental so that companies can properly support each other in their net zero journeys.

It's not just about business suppliers, though. Engagement with customers is also essential. While the desire to contribute to net zero is increasingly widespread across society, customers sometimes need to be educated about what behaviours are most conducive to the desired outcomes. Overall, it's clear that companies will not achieve net zero in isolation and that collaboration and partnerships are crucial. The involvement of all stakeholders is essential.

Finally, there needs to be an awareness that net zero is not necessarily the ultimate goal.

"Why stop at net zero? If you're a business that has achieved net zero, why not go further? Why not push into positive and say, "actually we haven't just got down to zero, we give back, and we're a net positive business",” concludes James Wood-Robertson (Shoosmiths).

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