UK GBC

The voice of our sustainable built environment

RENEWABLE ENERGY PROCUREMENT

Summary Report

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UK Green Building Council
ukgbc.org

ADVANCING NET ZERO

ACKNOWLEDGEMENTS

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CONTENTS

FOREWORD

MARK ALLAN
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Decarbonising the grid is central to the government's net zero strategy and imperative to many of our own net zero strategies. Businesses of all shapes and sizes can help accelerate this transition by demanding more from the energy market.

Good progress has been made in the last 10 years in transitioning the UK from fossil fuels like coal and gas to renewable alternatives. However, this needs to increase if we're going to fully decarbonise the grid by 2035.

Government policy and market reform will play a part in this, but as businesses we also have a role to play. The way in which we collectively procure electricity can help drive the change we need, driving investment into new renewable generators and supporting technologies like energy storage.

In order for this to happen as effectively as possible, stakeholders in the built environment need greater transparency and quality of information from the energy market, to enable them to meaningfully compare the procurement options that are available. Ensuring the choices we make have the impact needed for the future of our business and the future of the planet.

This new suite of guidance from the UKGBC, on which Landsec is proud to partner with them, gives industry the much needed tools for engaging with energy suppliers, to better understand the quality of the electricity products on offer.

For those who own and operate buildings in the UK, through the power of our collective voice, we can drive forward the change needed, ensure we're supporting suppliers who share our climate aspirations and help accelerate the decarbonisation of the grid.

FOREWORD

SMITH MORDAK
CHIEF EXECUTIVE
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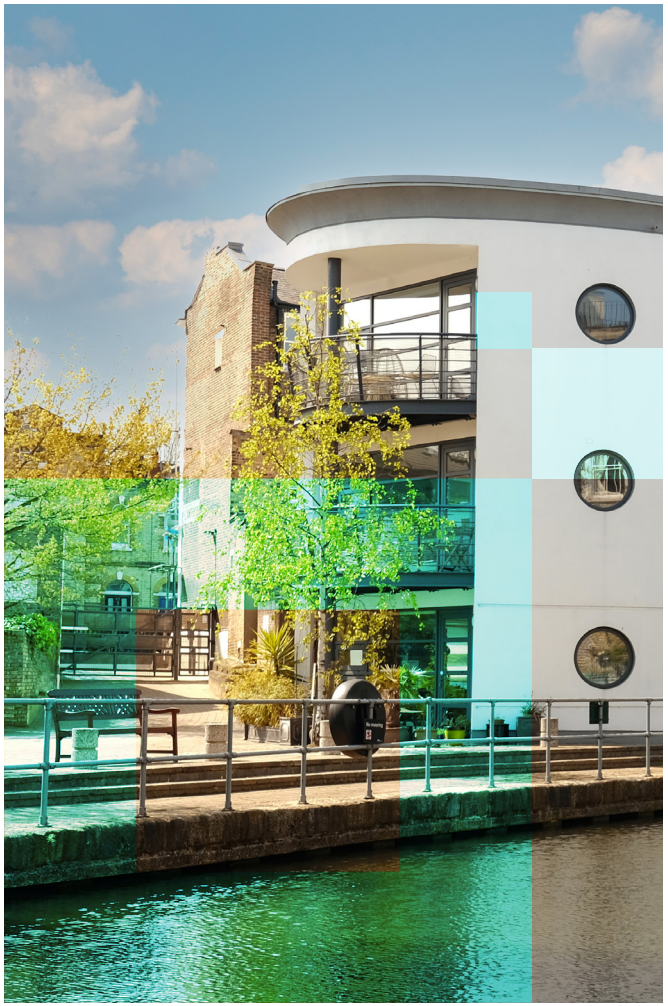
If the built environment is to substantially reduce its dependence on fossil fuels, we need buildings to respond to when renewable energy is available. This means ensuring we have the infrastructure and cultures in place to be flexible and resilient even when the wind isn't blowing or the sun isn't shining.

Buildings are no longer simply consumers of energy – no longer just hungry end points in the energy network. Our buildings are now integral to our shared electricity infrastructure. Whether we're generating renewable energy on site, using systems to vary buildings' energy demand, storing electricity to smooth out peaks, or procuring emerging energy products from the market which encourage flexibility, our buildings are becoming increasingly active, dynamic components of the wider system.

We can prepare our buildings for this change, but we also need a deeper and more nuanced understanding of the energy markets to work with energy suppliers to realise the evolution we need to see.

UKGBC would like to see energy markets evolve in synchronicity with the built environment to decarbonise the grid, address energy security and fuel poverty, and reduce operational costs. This includes ensuring that the cost benefits of the transition to a renewable-led grid translate to lower energy bills by decoupling the cost of electricity from the wholesale price of gas.

We call on members to engage with the market and each other on this important topic, and hope the tools provided in this guidance are a meaningful step towards the paradigm shift needed.



INTRODUCTION

Emissions from energy use in buildings account for nearly 18 per cent of the UK's total greenhouse gas emissions [1]. We need to decarbonise that energy consumption completely to deliver against our 2050 Net Zero target.

This 'v2' series of reports builds on the UKGBC's Renewable Energy Procurement & Carbon Offsetting guidance, published in 2021 (hereafter referred to as 'v1'). It enables built environment stakeholders to make more informed decisions about how and where they source their energy, giving them the tools to achieve their climate commitments whilst driving the continued decarbonisation of the energy supply sector.

The series covers renewable energy procurement, focussing on electricity. Updated guidance on Carbon Offsetting and Pricing has recently been published.

Whilst applicable to anyone involved in the design, delivery, or operation of a building, this guidance is of most use to energy procurement, facility management, and sustainability professionals. It will also be useful for energy systems designers, renewable energy generators, and energy brokers/suppliers.

NAVIGATING THE GUIDANCE

This summary report provides an overview of UKGBC's guidance on renewable energy procurement. The guidance is split into two parts across a series of four reports, first setting out the 'How' and the second part focussing on the 'Why'.

The first three reports in the series describe the 'How', giving stakeholders who procure electricity, and those responsible for building design and operation, the guidance and tools to make more informed procurement and operational management decisions. These reports have been developed with a view to responding to the principles of quality renewable electricity procurement identified.

The final report in the series focuses on the 'Why', outlining the importance of decarbonising the electricity system to deliver against our national Net Zero target. It also summarises the energy markets and the way procurement can help drive the transition from fossil fuel to renewable power, as well as the role the built environment has to play in enabling a resilient, decarbonised electricity grid. It is intended as an education piece, providing the rationale behind the guidance and tools given in the 'How'.

This summary report brings together the key conclusions, guidance, and recommendations from all of the reports. It is not exhaustive, and for most sections it gives an overview of the information to help users identify which documents will be most useful and relevant for them.

The two parts are split into the following reports and sections:

WHAT IS IT?		WHAT DOES IT COVER?	WHO IS IT FOR?
OVERVIEW Summary of the key information and recommendations	**SUMMARY REPORT**	■ Call to action ■ Energy markets and the energy system ■ Principles for quality renewable electricity procurement ■ Consumer-type specific recommendations ■ Tools for engaging energy suppliers ■ Rating your electricity strategy	Stakeholders wishing to get a high level overview of the suite of guidance and a summary of its key recommendations and the tools it provides, to understand which elements may be relevant for them.
THE 'HOW' Enabling better energy procurement	**REPORT 1** Key actions for built environment stakeholders	**SECTION 1.1: Responding to the principles for quality renewable electricity procurement** Identifies recommended actions for built environment stakeholders to respond to each of the three principles of quality renewable electricity procurement, as well as onsite measures. **SECTION 1.2: Consumer-type specific recommendations** Provides actions specific to three typical user profiles that built environment stakeholders can take today and pursue in future to improve their electricity procurement and stimulate market evolution.	Stakeholders who want to understand the actions they can take to secure better procurement that accelerates the decarbonisation of the electricity system.
	REPORT 2 Options available in the market	**SECTION 2.1: Factors affecting available procurement routes** Covers the factors that may influence the procurement routes available to a stakeholder procuring electricity in the built environment and actions to understand how those factors might be affecting them. **SECTION 2.2: Overview of the procurement options available** Provides a high-level summary of the range of typical procurement routes available. **SECTION 2.3: Power Purchase Agreements (PPAs) and other alternatives to green tariffs** Gives more detailed guidance on the range of PPA variants and other alternatives to green tariffs available, including their pros, cons, and key considerations.	Stakeholders who want to be enabled to better navigate the procurement options that are available in the market and the key considerations when determining which route is best for them.
	REPORT 3 Determining the performance of your electricity strategy	**SECTION 3.1: Tools for engaging energy suppliers** Provides a suite of quantitative metrics and qualitative questions to engage energy suppliers, enabling an assessment and comparison of the products available. **SECTION 3.2: Rating your electricity strategy** Defines a system for scoring your current or prospective electricity strategy under each of the three principles, including both onsite measures and procurement.	Stakeholders who want to be able to compare the specific energy products offered to them and subsequently benchmark their electricity strategy to understand how it performs.
THE 'WHY' Rationale behind the guidance	**REPORT 4** The role of the built environment in decarbonising the UK's electricity system	**SECTION 1.1: The electricity market and whole system decarbonisation** Summarises the current electricity market structure in the UK and the role energy procurement has to play in whole system decarbonisation. **SECTION 1.2: Principles for quality renewable electricity procurement** This section updates the three principles for quality renewable energy procurement and summarises the rationale behind each. **SECTION 1.3: Carbon accounting** Summarises the sources of emissions resulting from electricity generation and supply and the range of accounting approaches for calculating these emissions.	Stakeholders who want to understand the reasoning behind the guidance and tools provided and learn about the transition needed in the electricity system and markets to deliver against our national Net Zero target.

CALL TO ACTION

To deliver Net Zero, and reduce emissions in line with a carbon budget that would give us a reasonable chance of avoiding the worst consequences of man-made global heating, decarbonising the electricity system is a top priority.

To enable the electrification of heat and transport, whilst transitioning to a grid supplied by zero carbon sources of power, requires the rapid development of new renewable generators and supporting solutions such as energy storage. To support an electricity system led primarily by wind and solar, buildings need to reduce demand, maximise the deployment of onsite generation, and operate flexibly, responding to the availability of renewable electricity.

Buildings and organisations also have a role to play in driving the market to accelerate the decarbonisation that is already happening, sending demand signals which encourage renewables developers and energy suppliers to invest in the creation of new capacity and evolve their offering to reward consumers who manage their demand to minimise emissions and enable a resilient, zero carbon system.

UKGBC calls on its members and other built environment stakeholders to collaborate with the electricity market. Using the tools in this guidance, we can send a collective message that we will no longer settle for the status quo and need energy products without the greenwash, supplied with the evidence to prove that our procurement is driving meaningful change towards a net zero future.

UKGBC CALLS ON BUILT ENVIRONMENT STAKEHOLDERS TO:

1. **UNDERSTAND** – the importance of decarbonising the electricity system and the role buildings have to play in supporting a resilient, zero carbon grid **(Report 4)**.
2. **ENGAGE** with the energy market to secure the information to determine the performance of your current procurement strategy and review the range of alternative options available to you **(Report 2** and **Report 3)**.
3. **BENCHMARK** the performance of your building's electricity strategy – including both your procurement and onsite generation and demand management – using the rating system provided **(Report 3)**.
4. **IMPROVE** the performance of your electricity strategy by optimising your building's operation and exploring more ambitious procurement routes **(Report 1** and **Report 3)**.
5. **SHARE** your experiences and information with industry to help others on their procurement journey and strengthen the demand signals being sent to the energy markets.

ENERGY SYSTEM AND ELECTRICITY MARKETS

SEE REPORTS 1+4 FOR MORE INFORMATION

THE ENERGY SYSTEM

The electricity grid must operate at a constant frequency: when energy is taken from it, the frequency drops and this must be replenished by energy put in by electricity generators. This means that all energy on the system is 'pooled' – there is no way to distinguish in physical terms the electricity provided by a gas turbine or a wind farm.

Historically, the flow of energy has been primarily 'one way' – from the large, industrial-scale coal- and gas-fired power plants on the transmission network, through the distribution networks, to consumers. However, as we transition to a higher proportion of renewable generation and storage connected at the consumer-end of the network, this 'decentralisation' results in much greater two-way flow of energy (see Figure 1). This is making it more challenging to balance supply and demand across the system.

In addition, a transition from traditional forms of generation that can increase or decrease their output in response to the demand (such as gas turbines), to intermittent renewable generation (such as wind and solar), means the grid is less equipped to handle times of peak demand on the system.

Low carbon solutions are being implemented at a grid level to manage times when demand exceeds supply, such as energy storage, but more typically this demand is met through fossil fuel generation. Times where renewable supply exceeds demand are also increasing in frequency, and this often leads to the output from wind farms being curtailed, wasting valuable zero carbon energy.

Due to this, it is increasingly evident that in order to enable an electricity system that can operate at net zero carbon, there is a need to build in greater levels of flexibility at the demand side. Delivering and operating buildings as active components of the energy system will, therefore, be of ever greater importance to decarbonising in line with our Net Zero target.

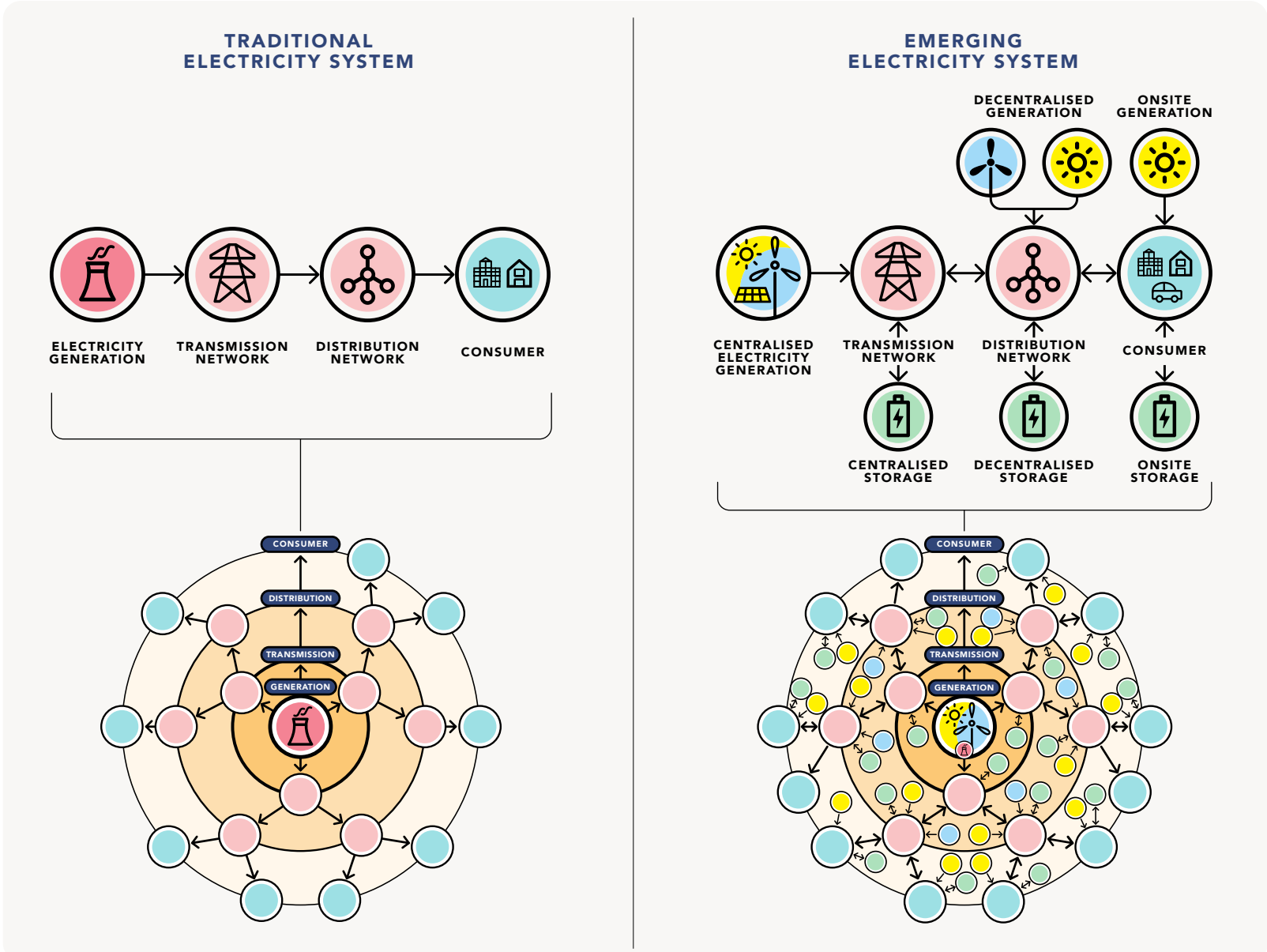


FIGURE 1:
Diagram showing the increasing complexity of the energy flows within the emerging electricity system compared to the traditional electricity system.

THE ELECTRICITY MARKETS

Due to the fact that the GB electricity grid is one connected system, trading the 'physical' energy from generator to end customer – as you would other commodities – is not possible in most cases. Instead, specific market mechanisms are used to govern the sale of energy within the system.

As well as generators who create the power and the customers who use it, there are two main participants in the electricity markets: suppliers, who buy electricity from generators and sell it to customers, and flexibility providers, who sell services which enable the system to be flexible to changes in supply and demand.

Suppliers sell electricity to customers on the retail market. They source this electricity through three key mechanisms:

- **Purchase from the wholesale market** – the way many suppliers source the majority of their electricity in GB, generators sell power to suppliers at a single price, set at a national level.
- **Direct contracts with generators** – rather than purchase entirely from the wholesale market, some suppliers engage directly with generators, procuring power through a contract called a Power Purchase Agreement (PPA).
- **Self-owned generation** – some suppliers have a proportion of their energy that is supplied from generators that they own and operate.

With most suppliers exposed to the wholesale market, the majority of customers in the UK share this exposure over the long term through the price they pay for electricity. Other than generating energy onsite (e.g., using solar panels), or owning a generator offsite, the most effective way for a consumer to avoid this exposure is to enter into a direct contract with a generator.

As with energy suppliers entering into PPAs, this contract between an end consumer and a generator allows the price of electricity to be set independently of the wholesale market, which is based on the wholesale cost of gas most of the time (see Report 4). There are a number of forms a PPA can take and they can pose constraints due to being technically and legally complex. It is for this reason that most customers in the UK opt for a tariff, product, or contract offered by an energy supplier.

The range of different procurement routes with which a commercial customer can engage, including both supplier tariffs and PPAs, are summarised in Report 2.

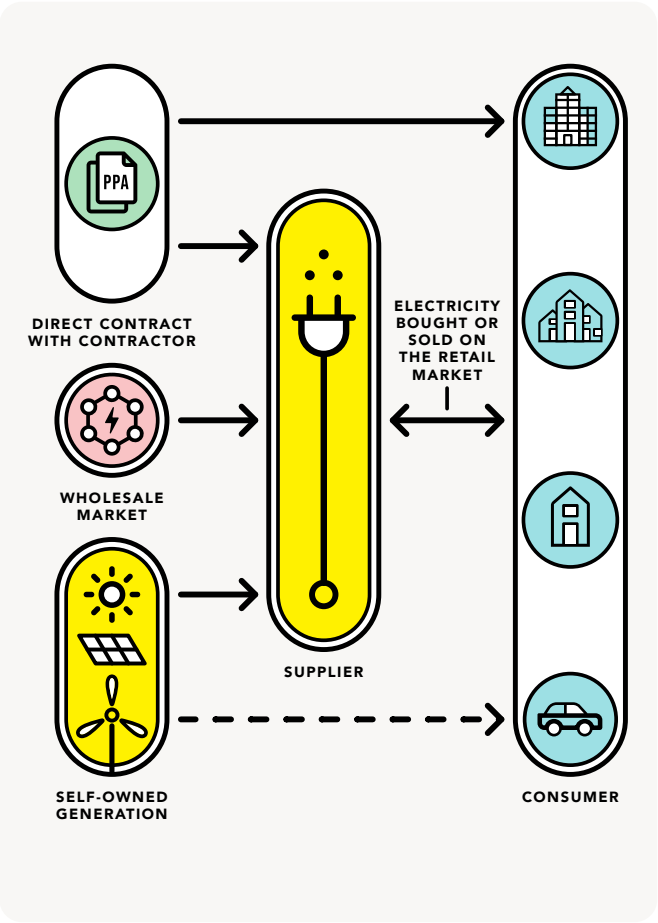


DIAGRAM 1: Diagram of the UK electricity market.

CARBON ACCOUNTING

There are two key approaches for accounting for emissions from electricity consumption: location-based and market-based.

The location-based method calculates emissions using the average emissions intensity of the entire system from which electricity is consumed, accounting for all the sources of generation feeding the grid. This emissions factor can be determined on an annual basis, as is used for national greenhouse gas (GHG) emissions reporting, or at a higher resolution (e.g., monthly, daily, or half-hourly).

The market-based approach allows consumers to claim the benefit of their procurement strategy in their emissions reporting and, in theory, support and send demand signals for renewable generation. In the case of the UK market, which implements a certificate-based renewables market, REGOs provide the primary mechanism through which the 'zero emissions' benefit of renewable electricity is typically claimed under a market-based approach. However, in a system where some consumers calculate their emissions using a location-based approach and some use a market-based approach, these 'zero emissions' are at risk of being double counted.

The carbon intensity of the UK grid varies constantly, as a result of the changing demand on the system and availability of renewable electricity to meet that demand. The current resolution of most carbon accounting approaches does not reflect this variability, nor does it value the supporting solutions that enable a resilient, decarbonised grid, such as demand-side flexibility and storage.

Responding to this, location-based emissions factors at a half-hourly resolution are available, and the carbon emissions of a building or organisation can be calculated for each half hour of the year if energy consumption data is available at a high enough resolution.

As well as hourly/sub-hourly location-based approaches, more granular market-based approaches are emerging. In the absence of time-based renewable energy certificates, these approaches rely on higher resolution information being provided from a consumer's energy supplier.

Table 1 overleaf summarises the different location-based, market-based, annual, and hourly/sub-hourly approaches to carbon accounting that can be implemented. This guidance does not provide recommendations on carbon accounting for buildings or organisations, deferring to the upcoming [2023] UK Net Zero Carbon Buildings Standard and potential GHG Protocol Scope 2 reporting guidance update for this.

Whilst this guidance doesn't recommend a specific approach, it is possible to conclude that transitioning from an annual to an hourly (or finer) resolution for carbon accounting is critical for three reasons:

- to most accurately reflect the emissions associated with buildings;
- to send demand signals for the types of renewables and supporting technologies that are most valuable to the system; and
- to reward demand-side flexibility.

SUMMARY OF CARBON ACCOUNTING APPROACHES

TABLE 1:
Summary of carbon accounting approaches for electricity consumption.

		ANNUAL	HOURLY/SUB-HOURLY
		■ Does not value demand-side flexibility ■ Does not accurately reflect the benefits of onsite generation	■ Reflects the benefit of demand-side flexibility ■ More accurately reflects the benefit of any onsite generation
LOCATION-BASED	■ Uses average carbon factors based on the grid's generation mix ■ Does not value any procurement decisions	■ Uses an emissions factor based on the annual grid mix – this can reflect the grid as a whole, or regional networks ■ Simplest accounting approach with lowest data requirements	■ Uses an emissions factor based on the hourly/sub-hourly grid mix – this can reflect the grid as a whole, or regional networks ■ Requires energy consumption data at an hourly resolution or better
MARKET-BASED	■ Uses supplier-specific information ■ Values a customer's procurement strategy	■ Uses annual data from suppliers ■ In the UK, any consumption matched with REGOs can claim zero emissions ■ Emissions associated with any consumption not matched by REGOs should use the residual grid factor ■ Can result in double counting of zero emissions from REGOs ■ Without additionality, REGOs do not contribute to the energy transition or a net reduction in emissions ■ REGOs do not include T&D losses so these should be calculated and accounted for under Scope 3	■ Uses hourly/sub-hourly data from suppliers ■ Requires energy consumption data at an hourly resolution or better ■ A market for granular renewable certificates (e.g., hourly/sub-hourly REGOs) does not currently exist ■ Unbundled annual REGOs can be used for hourly/sub-hourly matching if the zero emissions power is 'spread' over the annual generation profile of the source generator ■ Until a granular renewable certificate market is operational in the UK, hourly/sub-hourly carbon carbon intensity data based on the supplier's or supplier's product's mix should be used for carbon accounting

PRINCIPLES FOR QUALITY RENEWABLE ELECTRICITY PROCUREMENT

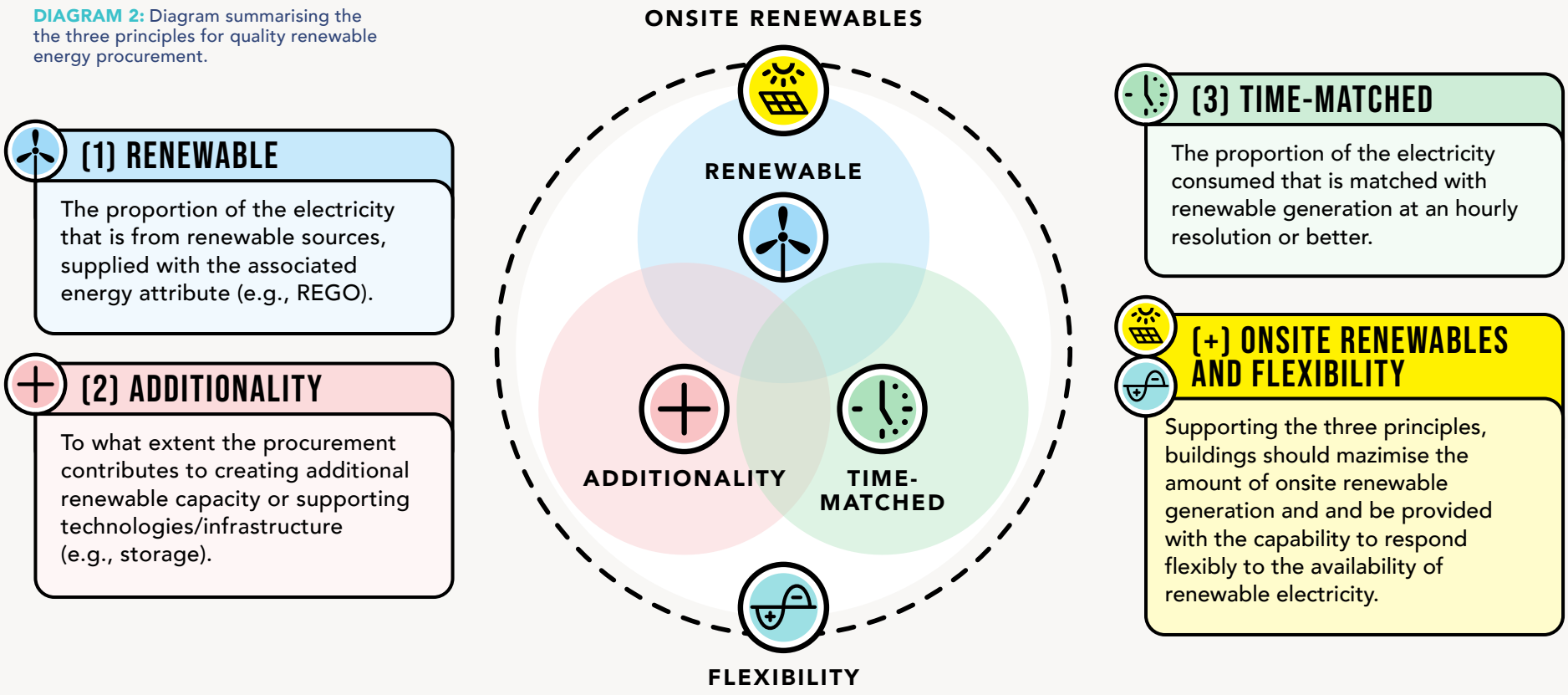
SEE REPORTS 1+4 FOR MORE INFORMATION

The quality of renewable electricity procurement can be established based on its performance against the following three principles:

- Renewable,
- Additionality,
- Time-matched

The best electricity procurement approaches will seek to maximise the extent to which they respond to these three principles. More information on the rationale behind the principles and subsequent recommendations can be found in Report 4.

DIAGRAM 2: Diagram summarising the the three principles for quality renewable energy procurement.



RENEWABLE

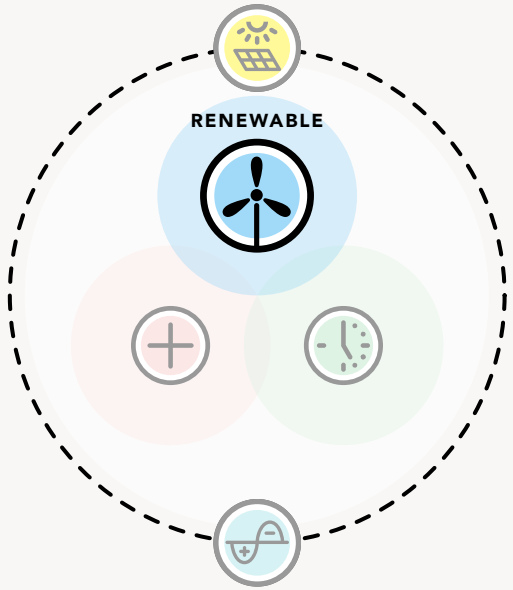
Electricity is renewable if it is generated using renewable sources of energy. Whilst there are many sources of renewable energy, some will have a more important part to play in decarbonising the electricity system and should be prioritised. Two key priority renewable sources are wind and solar.

The energy attribute is the certificate that is created when each unit of this renewable electricity is generated and represents the 'zero emissions' of that power. In the UK, Renewable Electricity Guarantee of Origin certificates (REGOs) are used.

REGOs do not need to be sold with their associated units of electricity megawatt-hour, and this can lead to issues of double counting of the emissions reductions from procuring renewable electricity. Purchasing these 'unbundled' REGOs also does not actively drive the electricity system to decarbonise. Whilst trading of certificates across borders is possible and is commonplace, it can lead to further issues with accurately accounting for emissions.

RECOMMENDED ACTIONS:

- Match 100 per cent of electricity imported from the grid with REGOs from UK generators – all REGOs must be retired by you or on your behalf.
- Maximise the proportion of the electricity you consume that comes from renewable generators which are owned or contracted via PPA by your energy supplier or by you directly – a proportion equivalent to the UK grid's annual renewable mix should be targeted as a minimum (**41% in 2022** [2]).
- Ensure that your supplier does not include any self-owned or PPA-contracted fossil fuel generation in your supplied mix.



ADDITIONALITY

Unless procurement leads to the creation of new, additional renewable generation, any renewable procurement takes a share of the electricity that is already available, and there is no net change in emissions at a system level.

There is no formally agreed definition for additionality and demonstrating it can be challenging. However, there are many ways that different procurement approaches can respond to the principle of additionality (i.e., be shown to be contributing to the creation of new renewable capacity).

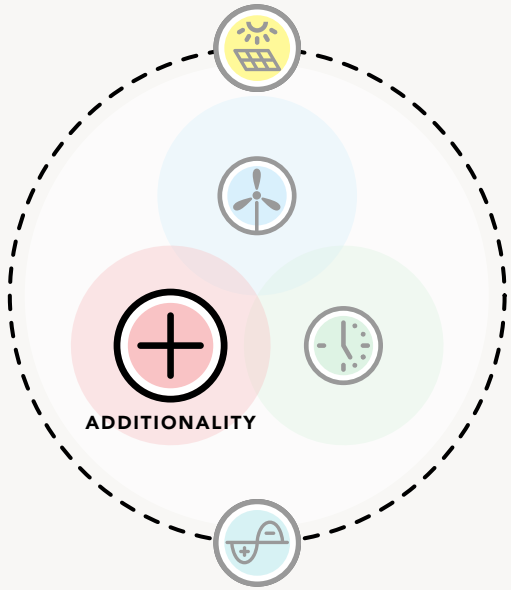
As well as new renewable generation, technologies such as energy storage are also needed to support a transition to a system with a high proportion of intermittent generation, to help supply meet demand. These supporting technologies should also be valued under the principle of additionality.

Future net zero energy system scenarios include substantially more rooftop solar photovoltaic (PV) capacity than currently exists. Onsite generation, such as solar PV, also provides the most robust and direct emissions reductions, meeting the principle of additionality. It should therefore be prioritised.

RECOMMENDED ACTIONS:

- Maximise onsite generation, delivering the target levels of solar PV capacity for the given building type from the UK Net Zero Carbon Buildings Standard* as a minimum, unless proven to be unachievable.
- For procurement offsite, offsite, owning or entering into a Power Purchase Agreement (PPA) with a new (unbuilt) or repowered unsubsidised renewable generator should be prioritised, as this provides the strongest additionality.
- As a minimum, PPAs directly procured should be with recently constructed (<3 years old) generators, owned and operated by companies that can demonstrate they are investing in the construction of new renewable assets.
- For electricity imported from the grid, procure a 'deep green' tariff/supply contract from an energy supplier (see Table 1 in Report 1).
- Ask your current or prospective energy supplier to qualify how they are meeting the principle of additionality in their operations, through investment in additional or repowered renewable capacity, storage, or R&D, as well as any other measures or actions they feel are relevant (see Report 3).
- A sub-hourly time-matched product should be prioritised over an equivalent annually-matched product.

*The UK Net Zero Carbon Buildings Standard will include target levels of onsite solar PV for key building types and is expected to be published in early 2024.



TIME-MATCHED

Most renewable electricity products currently match demand with supply on an annual basis. However, the output from renewable generators will not necessarily match the demand profile of the consumer. This means the consumer will be exposed to a proportion of fossil fuels in their generation mix, even if they are procuring a '100 per cent renewable' product.

Decarbonising the electricity system requires a varied portfolio of renewable generation, storage, and other flexibility technologies. However, current annual matching approaches do not appropriately value these solutions and only create demand signals which drive development of the cheapest forms of renewable generation – wind and solar.

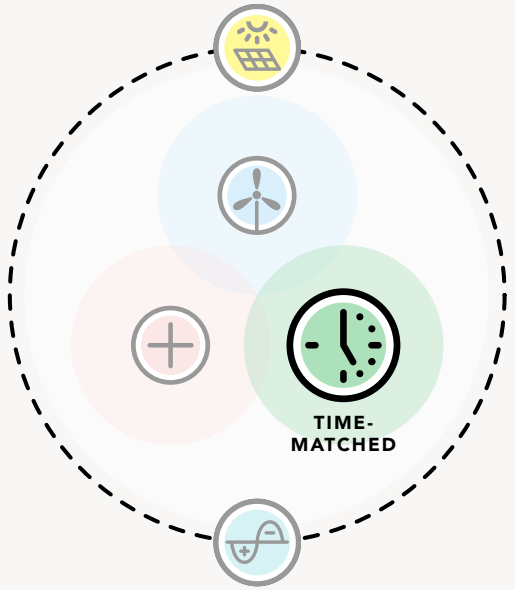
By tracking and matching demand with renewable electricity at an hourly resolution or better, the consumer can be more confident that they are actually receiving renewable electricity and consequently driving demand for renewables and storage that have the greatest value to the energy system.

The proportion of a consumer's demand that is matched with renewable supply at an hourly/sub-hourly level is the 'time-matched percentage'. This can be calculated based solely on the energy imported from the grid, or including the contribution from any on site generation, storage, and demand management.

Examples of energy products which use hourly/sub-hourly price or carbon signals already exist, and consumers can benefit from reduced energy cost and carbon by flexing their demand in response to these. Actively time-matched products are not widely available, but consumers can help develop these offerings through engagement with their energy suppliers.

RECOMMENDED ACTIONS:

- Track your building or organisation's demand at an hourly resolution or better, as well as any onsite generation and storage.
- Engage your energy supplier or any renewable generators with whom you have a contract to understand what proportion of your grid imported electricity is currently matched with renewables at an hourly/sub-hourly level (i.e., determine your time-matched % excluding any onsite generation).
- Explore the possibility of engaging in an actively time-matched product with your current supplier or prospective suppliers and, if available, procure a time-matched product.
- Work with your energy supplier or generator to maximise your time-matched %, including any onsite generation, storage, and other demand management.
- If time-based energy attribute certificates (T-EACs) become available, seek to match the greatest proportion of your demand with sub-hourly certificates as possible.

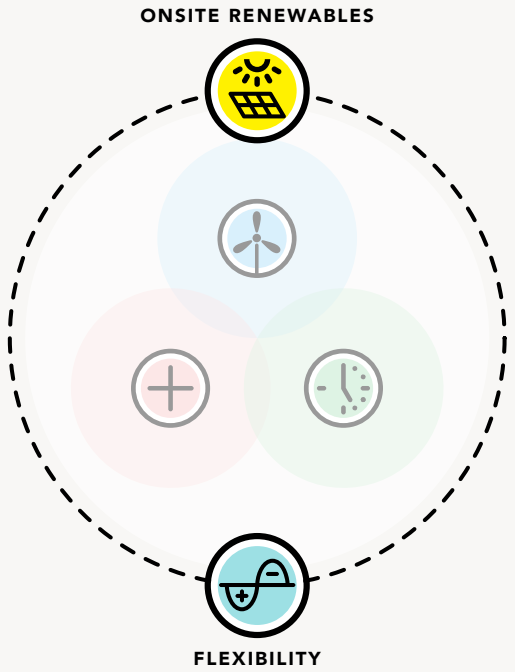


ONSITE RENEWABLE GENERATION AND FLEXIBILITY

Whilst not strictly related to the procurement of energy, onsite generation and flexibility have an important role to play in decarbonising the electricity system, providing critical additional renewable generation and supporting 'time-matched' approaches by maximising the proportion of demand that is met by renewable energy in real time.

RECOMMENDED ACTIONS:

- Maximise onsite renewable electricity generation.
- Implement active demand management through smart systems and appliances to utilise electricity generated onsite as far as possible and respond to the carbon intensity of the grid.
- Review the potential benefits of energy storage to maximise the self-consumption of any electricity generated onsite (ensuring other factors such as embodied carbon are considered).
- Onsite generation and flexibility should be used to maximise the proportion of energy consumed that is from renewable sources at an hourly/ sub-hourly level (i.e., time-matched % should be maximised).



CONSUMER-TYPE SPECIFIC RECOMMENDATIONS

SEE REPORT 1 FOR MORE INFORMATION

The ability of the range of stakeholders in the built environment to pursue certain procurement routes and influence the energy market differs greatly depending on their characteristics. Figure 2 gives some rules of thumb that can help stakeholders understand what actions they can take today and in the future to secure better electricity procurement based on three typical user profiles.

USER PROFILE CHARACTERISTICS	SMALL (e.g., <5GWh/year)	MEDIUM (e.g., 5-25GWh/year)	LARGE (e.g., >25GWh/yr)
USER PROFILE			
PURSUE TODAY	■ **Start with renewable and additionality:** Push for transparency from suppliers on where they source renewables and their contribution to additionality. ■ **Be transparent:** Share information from suppliers to create demand signals for better products.	■ **Demand time-matching:** Press suppliers for time-matching information in addition to maximising alignment with the principles of renewable and additionality. ■ **Be transparent:** Communicate level of time-matching currently happening at supplier or product level.	■ **Drive maximum additionality:** Support the construction of new generators by engaging in Power Purchase Agreements (PPAs) after maximising onsite energy production. Where attractive, consider investment in supporting technologies (e.g., storage).
PUSH FOR LONGER-TERM	■ **Move to demanding time-matching:** Push existing suppliers to offer transparency on time-matching. ■ **Make active choices:** Actively pursue procurement with a better-quality supplier based on the data you are securing and comparing.	■ **Push for greater additionality:** Consider sourcing renewable energy (PPA or through suppliers) as a collective/basket initiative to directly support new generation. ■ **Get more granular:** Work with suppliers to understand and optimise customer-specific time-matching.	■ **Flex demand:** Actively manage demand and onsite generation to support supply-side time-matching and maximise maximise the % of demand that is matched with renewable power at an hourly-/sub-hourly level. ■ **Bring others along:** Work alongside suppliers and smaller companies to help de-risk collective PPA procurement options.
VALUE OF ENERGY TO THE ORGANISATION	■ Energy is solely an operational consideration.	■ Energy is not a core business consideration but is still a part of their offering.	■ Energy is part of their business offering already or is a high proportion of the organisation's operational cost.
ENERGY DEMAND	■ Energy demand is low, resulting in a high dependence on existing supplier products.	■ Energy demand is high enough to make demand signals somewhat material to suppliers.	■ Requires a large supply volume of energy, making demand signals very material to generators and suppliers.
EXPERTISE	■ Does not have in-house expertise or an appointed procurement specialist.	■ Has an appointed procurement specialist but may not have in-house expertise.	■ Has expertise in-house to proactively engage in the energy market.
CREDIT-WORTHINESS	■ Does not meet the threshold of credit-worthiness required for highly additional procurement routes and therefore needs significant support to de-risk.	■ Due to size, requires some form of de-risking to engage in certain procurement routes.	■ Has good credit, enabling engagement in most procurement routes.
PERIODICITY	■ Only procures for shorter intervals linked to lease agreements.	■ Could engage in contract lengths of up to 5 years with suppliers but typically not longer.	■ Able to engage in long-term contracts to optimise pricing and risk.
INFLUENCE	■ Individual sway is low and would benefit from working collectively to send material demand signals to suppliers.	■ Could be working on behalf of a collective of small energy users.	■ Able to make the business case for procurement options that are highly 'additional'.

FIGURE 2:
Actions to secure better quality electricity procurement for three typical user profiles.

TOOLS FOR ENGAGING ENERGY SUPPLIERS

The vast majority of buildings and organisations procure part or all of their energy through an energy supplier, typically through an electricity tariff. Recognising this, this guidance includes tools for engaging energy suppliers and sourcing the relevant information to compare the options available, including both quantitative metrics and qualitative questions.

The purpose of these tools is to support more proactive engagement with energy suppliers, summarising and standardising the information that is needed from them to support built environment stakeholders in their procurement decision-making.

These tools are described in full detail in Report 3, but the metrics and questions provided are summarised in Figure 3 and Figure 4, respectively. These are intended to provide information that can both assist in comparing the energy products available to a customer and contribute to determining the score for a current or prospective electricity strategy, as outlined in the subsequent section.

Through testing with electricity suppliers, the information requested should be available. In cases where it is not, it is hoped that this engagement will help to create the demand signals for better information transparency and product evolution, to increase the availability of procurement options which enable organisations to meaningfully contribute to decarbonising the electricity system.

SEE REPORT 3 FOR MORE INFORMATION

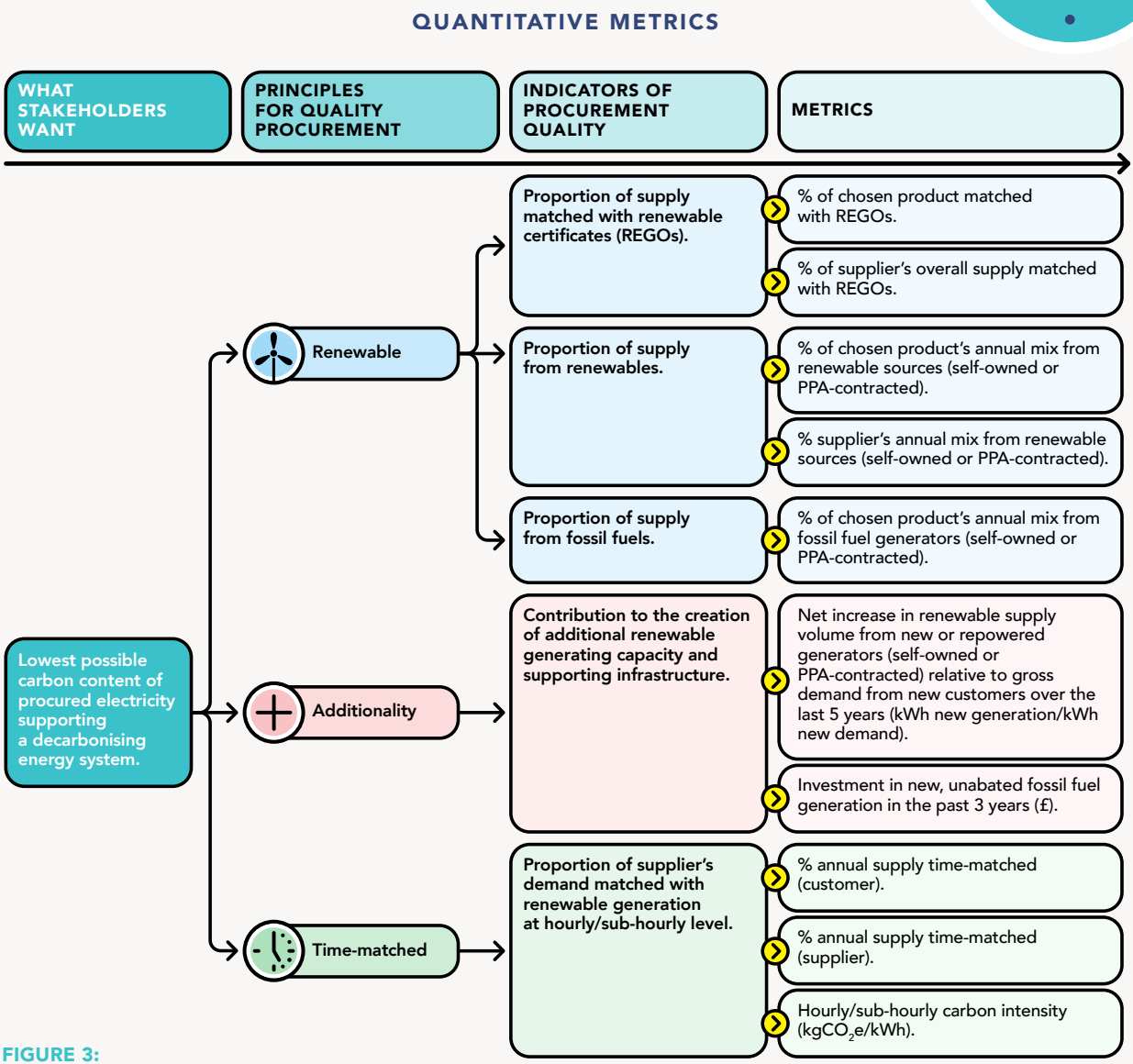
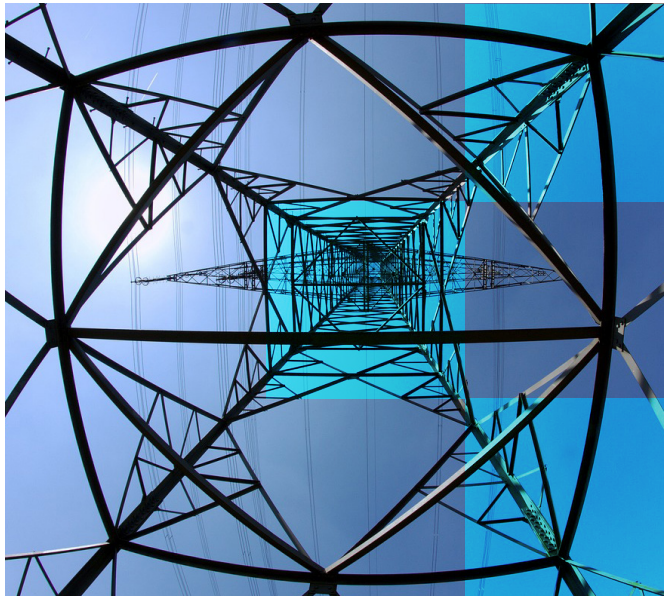


FIGURE 3:
Summary of the quantitative metrics for engaging energy suppliers.

SHARE YOUR EXPERIENCES USING THE TOOLS

To enable shared learnings, stakeholders utilising the questions and metrics provided to successfully secure information from energy suppliers are encouraged to share this with UKGBC and peers in industry.



QUALITATIVE QUESTIONS

TOPIC	QUESTION
Alignment on ambition	Has the supplier set public decarbonisation commitments and/ or strategies and realised progress against them?
Commercial real estate customers	Can the supplier demonstrate its ability to actively engage with commercial real estate stakeholders pursuing more ambitious approaches?
Renewable procurement and supply	Does the supplier have a clear list of capabilities and credentials within renewable energy procurement and supply?
Additionality	Can the supplier demonstrate active investment in the creation of additional renewable generating capacity?
Innovation	What is the supplier's degree of demonstrable product and commercial innovation?
Wider impact	Does the supplier's overall strategy align with the principles of decarbonisation, just transition, environmental activism, and other broader important issues?

FIGURE 4:
Summary of the qualitative questions for engaging energy suppliers.

RATING YOUR ELECTRICITY STRATEGY (BETA)

SEE REPORT 3 FOR MORE INFORMATION

Utilising the tools provided in the previous section, this guidance provides a methodology for assessing the performance of a building or organisation's overall electricity strategy, including electricity procured from off site, as well as any onsite generation, demand management, and storage.

The strategy is scored under the three principles of 'renewable', 'additionality', and 'time-matched' to give an overall score from 0 to 10. This, in turn, corresponds to a Bronze, Silver, or Gold rating.

As well as enabling buildings and organisations to assess the quality of their current strategy in contributing to whole system decarbonisation, it can be used to assess the benefit of prospective procurement options or onsite solutions. It can also be used by tenants to help in leasing decisions and landlords to set requirements on tenants through a green lease or similar.

Achieving a high score under this approach is likely to be challenging in the short- to medium-term. Substantial technological and market evolution is anticipated to be required before routes which allow a high rating to be achieved are available to the mass market. However, the purpose of such a scale-based rating system and the supporting tools for engaging energy suppliers is to create a standardised methodology which facilitates consistent assessment of the procurement options available.

This empowers stakeholders in the built environment to make more informed decisions about how they source their electricity and how they operate real assets to best support the energy system to decarbonise. In turn, this will create coordinated demand signals for greater transparency and better products, as well as enabling shared learnings, allowing both the built environment and energy supply sectors to progress towards the shared goal of a resilient, zero carbon, and low-cost electricity system.

To support this, UKGBC requests that any stakeholder using this rating system to assess their current electricity strategy shares the assessment information with us. The supporting calculation tool has been created to also act as a proforma to enable this, and the information can be provided anonymised if desired.

Full details are provided in Report 3.

PLEASE NOTE that the rating system is currently considered to be at a 'beta' stage. We will be using feedback and data received from industry to refine the assessment methodology and scoring thresholds to ensure the approach best reflects an electricity strategy's contribution to decarbonising the energy system.

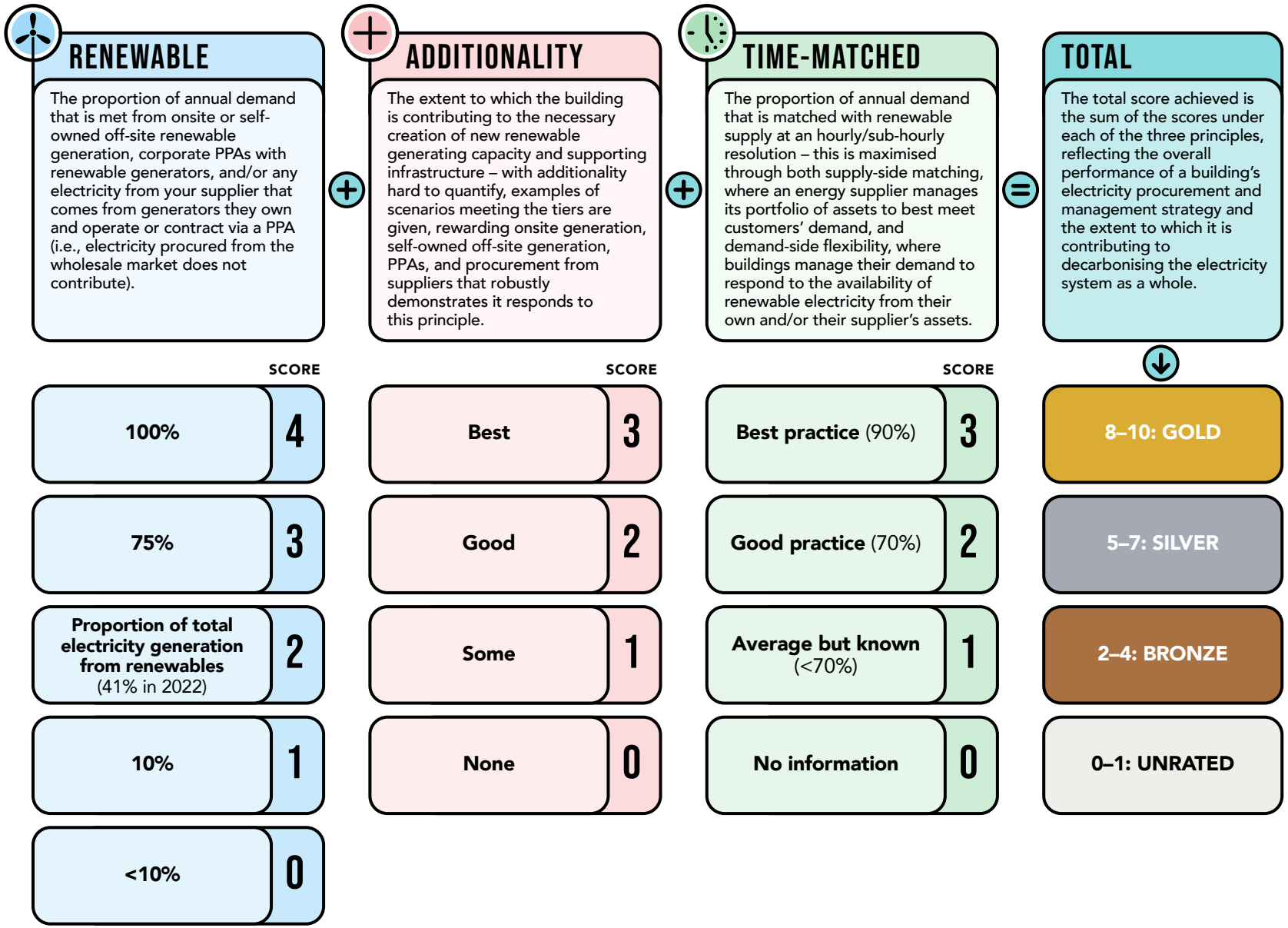


FIGURE 5: Summary of the methodology.

BACKGROUND INFORMATION

Context

In 2021, UKGBC published a supplementary report to support its Net Zero Carbon Buildings (NZCB): A Framework Definition. This provided guidance on the procurement of renewable energy and carbon offsets to mitigate emissions from the construction and operation of buildings, defining how this relates to net zero carbon claims.

This update has been driven by feedback from industry on the challenges of pursuing electricity procurement that aligns with the v1 guidance in the real world.

The current energy crisis has reduced the already low availability of options which meet the principles defined by v1. In addition, the accessibility of these options to the range of stakeholders procuring energy in the built environment is varied, often precluding all but the most established players with large portfolios of assets.

This binary nature of the v1 guidance creates a situation where there is no incentive for built environment stakeholders to pursue anything better than the lowest quality procurement options where ambitious strategies meeting its principles are unavailable or inaccessible.

There are, in fact, a broad range of routes for procuring renewable electricity available. This guidance aims to present this spectrum of options in a way that enables built environment stakeholders to determine which route is best for them. They will gain an understanding of the implications at an organisational or asset level, as well as the impact on the decarbonisation of the electricity system.

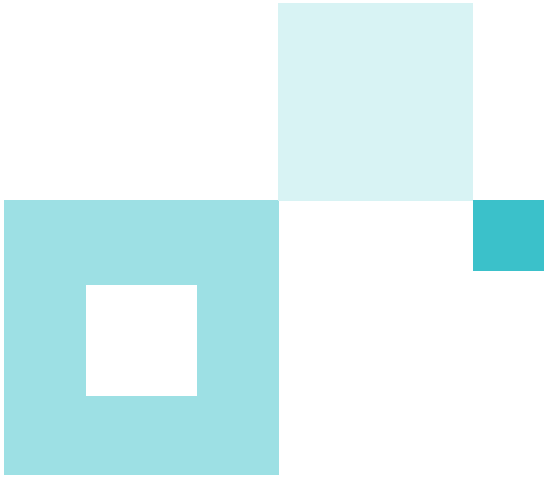
Relationship with the UKGBC Framework Definition and UK Net Zero Carbon Buildings Standard

As well as providing general guidance on how to procure renewable energy and carbon offsets, v1 also defined how this relates to net zero carbon building claims in line with our Framework Definition.

Whilst the Framework Definition is still being used to inform the delivery of buildings in the UK, a cross-industry group of professional institutions and industry bodies – including UKGBC – is currently leading an initiative to develop a UK Net Zero Carbon Buildings Standard. This industry-led standard intends to build on existing net zero guidance in the market, such as the UKGBC Framework, reflecting the most recent climate science and expert knowledge to deliver a definition of, and process for, verifying a net zero carbon building in the UK market.

When the Standard is published, it is anticipated that this will supersede existing net zero carbon building definitions. As such a point, the Framework Definition will be retired. Much of its supplementary guidance, however, is likely to remain valuable in supporting the implementation of the Standard.

Those involved in the project to deliver this v2 update are actively engaging with those defining requirements on energy procurement and carbon accounting for the Standard to encourage alignment and the applicability of this guidance as far as possible beyond the retirement of the UKGBC Framework Definition.



Approach to drafting this update

This update transposes applicable information from v1 where it is still relevant and robust. Some elements have been evolved in response to feedback from industry or based on review of recent literature. Others are new, where novel guidance was identified as being necessary to deliver against the objective of enabling all stakeholders in the built environment to make more informed procurement decisions.

Applicability of this guidance

Gas

A significant proportion of today's buildings currently use a gas boiler to generate heating and hot water. To achieve net zero, fossil gas will need to be entirely phased out as a direct fuel source for heating buildings.

The v1 report contains a section on fossil fuel use in existing buildings. However, this was primarily to support information on when and how existing buildings with gas boilers can claim net zero carbon. This will be addressed by the UK Net Zero Carbon Buildings Standard, and this section has not been carried over into this update.

Green gas/biogas is a renewable alternative to fossil gas. The v1 guidance provided a high-level overview of the green gas market and how it should be treated within net zero carbon claims. This update includes relevant elements of that guidance (see Report 2). However, green gas is likely to meet only a very small proportion of the energy demand from buildings in future, with the CCC concluding that the electrification of heat should deliver the majority of the decarbonisation of the built environment needed to meet our national Net Zero target [3].

FOCUS ON ELECTRICITY PROCUREMENT

Whilst guidance on green gas procurement is transposed and updated from v1, this update primarily focuses on deepening guidance on procuring renewable electricity, identifying actions that will accelerate the continued decarbonisation of the UK electricity grid.

Domestic vs business customers

This guidance is primarily intended to support those procuring energy on behalf of businesses or commercial buildings, rather than domestic customers (i.e., corporate procurement).

There are already tools in place to help domestic customers choose greener energy suppliers and products, such as the Uswitch Green Accreditation, which employs an expert panel to review and rate suppliers' tariffs. Business customers have a broader range of options available to them and greater freedom to demand more of those who are supplying them with energy. However, the technical and legal complexity of many of the procurement routes represent a barrier to entry for much of the market.

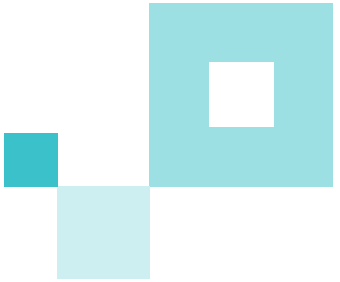
As such, whilst the principles of this guidance reflect the nature of the electricity market and system as a whole – and are therefore relevant and applicable to anyone procuring electricity in the UK market – the tools are geared towards enabling businesses to navigate the procurement landscape to secure supply contracts that align with their level of climate ambition and better understand the broader impact of their procurement strategy.

Buildings vs organisations

This guidance is relevant for all building types, sizes, and tenancies. Where a developer, building owner, asset manager, or occupier has full control over the energy they procure, this guidance can be used directly to inform that procurement. Where a tenant's lease requires them to procure part of all of their energy or heat from a landlord, it is expected that the tenant proactively engages with the landlord to influence their procurement.

As well as informing the energy procurement for individual buildings, this guidance is also applicable for organisations procuring energy to cover a portfolio of assets or the demand associated with an organisation's entire operations, including informing broader organisational net zero strategies.

Existing initiatives, such as RE100 and GHG Protocol Scope 2 Guidance, already support divesting away from fossil fuels to cleaner alternatives through procurement. This update complements these existing initiatives, providing further direction on procurement specific to the UK market and context, giving stakeholders the tools to minimise the risk of inadvertent greenwashing that can occur through the procurement of certain 'green' energy products.



GLOSSARY

TERM	DESCRIPTION
24/7 CARBON-FREE ENERGY (24/7 CFE)	Describes energy consumption where 100% of demand is matched with carbon-free supply at an hourly resolution or better.
ADDITIONALITY	Additionality describes the situation where an action results in an activity or intervention that otherwise would not have occurred had the action not taken place (i.e., additional relative to business-as-usual). In the context of procuring renewable electricity, additionality is achieved where greenhouse gas emissions reductions/removals occur as a result of new or repowered generating capacity that would not have happened in the absence of engaging in a given procurement route.
ANNUAL-MATCHING	The process by which electricity supply or consumption is matched with renewable power on an annual basis. This can be done by procuring Energy Attribute Certificates (EACs) only or by procuring the renewable power directly from a generator.
BEHIND THE METER	Describes anything that happens on the energy user's side of the meter (i.e., directly within the control of the asset).
BIOENERGY CARBON CAPTURE AND STORAGE (BECCS)	Electricity generation that is produced using biofuels where the resultant CO_2 is captured and stored long term, resulting in net negative carbon emissions.
BIOFUELS/BIOMASS	A fuel that is derived from biological/organic matter.
BLUE HYDROGEN	Hydrogen that is created by reforming natural gas and capturing the resultant CO_2.
BUNDLED POWER/ BUNDLED REGOS	Renewable electricity where the power is sold/procured together with its associated Energy Attribute Certificates (EACs).
CARBON CAPTURE, UTILISATION, AND STORAGE (CCUS)	A technology via which CO_2 resulting from a process is captured and used for other process or stored long term.
CARBON FACTOR	A measure of the emissions intensity of a process or fuel.
CARBON-FREE ENERGY/ ELECTRICITY	A term used to describe zero emissions sources of energy/ electricity generation. This includes renewables and nuclear power.
CARBON-FREE ENERGY/ ELECTRICITY (CFE) SCORE	A score between 1 and 100 reflecting the percentage of an energy consumer's demand that is matched with carbon-free supply at an hourly resolution or better, over the course of a year.
CLEAN ENERGY SOURCES	Energy sources that are zero carbon but not renewable.
CARBON DIOXIDE EQUIVALENT (CO_2E)	CO_2e or Carbon Dioxide Equivalent is a unit used to equivalate the emissions of other greenhouse gases (GHGs) to emissions of carbon dioxide (see Global Warming Potential). It also allows the impact of activities that result in the emissions of a variety of different GHGs to be described by a single number.
CARBON EMISSIONS	In the context of sustainability, Carbon Emissions is used as a collective term to describe the emissions of any GHGs.
CARBON SEQUESTRATION	Carbon Sequestration is the process by which carbon dioxide is removed from the atmosphere and stored within a material.
CLIMATE CHANGE	Climate Change refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, such as through variations in the solar cycle. But since the 1800s, human activities have been the main driver of climate change, primarily due to burning fossil fuels like coal, oil and gas.
CONTRACTS FOR DIFFERENCE (CFD)	A long-term contractual agreement between a low carbon electricity generator and the UK Government which guarantees a "Strike Price" for all electricity generated, where the difference between the market price and strike price is either paid to the generator by the government or paid back to the government by the generator.
CURTAILED/ CURTAILMENT	Describes a situation where the output from variable renewable generators (such as wind turbines) is reduced in times where supply exceeds demand or the transmission infrastructure has insufficient capacity to accommodate the energy flows.

TERM	DESCRIPTION
DECARBONISATION	Decarbonisation is the process of reducing the net amount of Greenhouse Gas (GHG) emissions released to the atmosphere.
DISTRIBUTION NETWORKS	The electricity networks that manage the flow of electricity from the national transmission network to end customers.
DISTRIBUTION NETWORK OPERATOR (DNO)	A licenced company that that manages the operation of a distribution network.
DISTRIBUTION SYSTEM OPERATOR (DSO)	An evolution of a Distribution Network Operator (DNO) which is necessitated by the more complex flows and management of electricity within the distribution networks.
EMBODIED CARBON	Embodied Carbon or Life Cycle Embodied Carbon emissions of a product are the total GHG emissions and removals associated with its manufacture, transport, installation, maintenance, and end of life treatment.
ENERGY ATTRIBUTE CERTIFICATE (EAC)	A certificate that provides information about the environmental attributes of one megawatt hour (MWh) of electricity. REGOs are the EACs used in the UK.
FLEXIBILITY PROVIDER/ FLEXIBILITY SERVICES PROVIDER (FSP)	An owner of assets, or an aggregator managing multiple assets, that can provide flexibility services by making temporary changes to the way they consume, generate, or store electricity when requested, to ensure continuity of supply.
GENERATOR	The operator of an asset that can generate electricity.
GREENHOUSE GAS (GHG)	Greenhouse Gases (GHG) are constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds.
GHG PROTOCOL	GHG Protocol establishes comprehensive global standardized frameworks to measure and manage greenhouse gas (GHG) emissions from private and public sector operations, value chains and mitigation actions.

TERM	DESCRIPTION
GLOBAL WARMING POTENTIAL (GWP)	Some GHGs have a substantially higher GWP than carbon dioxide, meaning the same quantity of emissions has a greater impact to global heating. For example, methane's GWP is 25, meaning 1 tonne of methane trap 25x more heat than 1 tonne of carbon dioxide.
GREEN GAS	A gaseous fuel created by processing organic matter by bacteria.
GREEN HYDROGEN	Hydrogen that is created by electrolysing water using renewable electricity.
GREEN TARIFF	A term used to describe a range of energy products offered by suppliers that, as a minimum, have been fully matched with Energy Attribute Certificates (EACs).
GUARANTEES OF ORIGIN (GOS)	The Energy Attribute Certificate (EAC) scheme used in central Europe, closely related to the UK REGO scheme.
HYDROGEN	A gaseous fuel that combusts to produce water.
IN FRONT OF THE METER	Describes anything that happens on the energy system side of the consumer's meter (i.e., not in directly control of an asset).
INTERMITTENT RENEWABLE GENERATION	Renewable electricity generators that depend on variable renewable energy sources, such as wind and solar.
IPCC	The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change.
LIQUID AIR ENERGY STORAGE	A form of energy storage where air is compressed into a liquid form and stored in insulated containers. When needed, the liquid air is evaporated and this energy is used to generate electricity, typically through a turbine.
LITHIUM-ION BATTERY	A form of electrical energy storage which uses the reversible reduction of lithium ions in the material to store electricity.
LOCATIONAL MARGINAL PRICING	A way for wholesale electricity prices to reflect the value of the energy at different locations, accounting for the patterns of load, generation, and the physical limits of the transmission system.

TERM	DESCRIPTION
LOCATION-BASED CARBON ACCOUNTING	A methodology for calculating carbon emissions based on the carbon intensity of the local grid area where the electricity usage takes place.
MARGINAL EMISSIONS FACTOR	A measure of the emissions caused by a small change in demand on the system, reflecting the fact such changes in demand do not increase or decrease the demand for all generation types equally.
MARGINAL PRICING	In the context of electricity procurement, marginal pricing is an approach to pricing electricity that sets the price of all electricity based on the cost of meeting the marginal demand (i.e., the final bit of demand on the system).
MARKET-BASED ACCOUNTING	A methodology for calculating carbon emissions based on the specific procurement decisions made by an electricity customer (e.g., claiming the benefit of Energy Attribute Certificates).
NATIONAL GRID ELECTRICITY SYSTEM OPERATOR (ESO)	The licenced company responsible for the management of the GB electricity system's transmission network.
NET ZERO	Net Zero is where all related Greenhouse Gas (GHG) emissions have been reduced in line with a science-based target which aligns with what has been determined to be necessary to stand a reasonable chance of limiting the global temperature increase to 1.5˚C above pre-industrial levels as a minimum. These residual emissions are subsequently responsibly offset to achieve a sum total of zero emissions.
OPERATIONAL CARBON	Operational Carbon are the GHG emissions arising from all energy consumed by a product in-use, over the product's whole life cycle.
PEAK DEMAND	The time of greatest overall energy demand. This can be measured at an asset-level or a system-level.
POWER PURCHASE AGREEMENT (PPA)	A contractual arrangement for power between a generator and a supplier or consumer.
RENEWABLE CERTIFICATES	A general term for Energy Attribute Certificates (EACs).

TERM	DESCRIPTION
RENEWABLE ELECTRICITY GUARANTEE OF ORIGIN CERTIFICATES (REGOS)	The Energy Attribute Certificate (EAC) scheme used in the UK.
RENEWABLE ENERGY CERTIFICATES (RECS)	The Energy Attribute Certificate (EAC) scheme used in the USA and Canada.
RENEWABLE ENERGY	Energy derived from natural sources that are replenished at a higher rate than they are consumed.
RENEWABLE GENERATION	A general term for any electricity generated using renewable sources of energy.
RESIDUAL EMISSIONS FACTOR	A measure of the emissions intensity of electricity from a given system after all electricity 'claimed' via Energy Attribute Certificates (EACs) has been removed from the mix (i.e., the emissions intensity of the residual grid mix).
RESIDUAL GRID MIX	The mix of generation supplying the system after all electricity 'claimed' via Energy Attribute Certificates (EACs) has been removed from the mix.
RETAIL MARKET	The market through which energy customers procure energy from a supplier.
SCOPE 1	Direct emissions from sources that are controlled or owned by an organisation. This includes any onsite combustion (e.g., from gas boilers for heating, and from company vehicles).
SCOPE 2	Indirect emissions that result from the purchase of electricity, heat, or steam that is generated offsite.
SCOPE 3	Indirect emissions from sources that aren't owned or controlled by an organisation, but that they indirectly affect in their value chain.
SELF-OWNED GENERATION	Electricity generating capacity that is owned and operated directly by the referenced party. This could be energy suppliers or building owners.
SUB-HOURLY	At a resolution of less than one hour.
SUBSIDISED GENERATION	Electricity generation that is financially supported by government or other schemes, such as the Contracts for Difference (CfDs).

TERM	DESCRIPTION
SUPPLIERS	Companies that procure energy and supply energy to customers on the retail market.
TARIFFS	The price at which energy is sold by a supplier to a customer.
TIME-BASED ENERGY ATTRIBUTE CERTIFICATES (T-EACS)	Energy Attribute Certificates (EACs) that include the time of generation at an hourly resolution or better.
TIME-MATCHED	Electricity demand that is matched with renewable supply at an hourly resolution or better.
TOTAL GENERATION MIX	The mix of all generation types supplying the system over a given time period.
TRANSMISSION NETWORK	The high voltage system for the transmission of power from large-scale generators to the distribution networks.
UNBUNDLED POWER	Renewable electricity that is sold without the associated Energy Attribute Certificates (EACs).
UNBUNDLED REGOS	Energy Attribute Certificates (EACs) that are sold separately to their associated power.
UNSUBSIDISED GENERATION	Generation that is not financially supported by government or other schemes, such as the Contracts for Difference (CfDs).
WASTE INCINERATION	A process where household waste is incinerated to boil water which is subsequently passed through a turbine to generate electricity.
WHOLE LIFE CARBON	Whole Life Carbon emissions are the sum total of all the associated GHG emissions and removals, for the embodied, operational and disposal of a product through its whole life cycle.
WHOLESALE MARKET	The general term for the market on which electricity is traded by generators and suppliers.
ZERO CARBON	Zero Carbon is where there are no related Greenhouse Gas (GHG) emissions.

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ADVANCING NET ZERO

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