



Department for  
Business, Energy  
& Industrial Strategy

# Designing a Framework for Transparency of Carbon Content in Energy Products

A Call for Evidence

Closing date: 6<sup>th</sup> December 2021

August 2021



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# Executive summary

*The UK energy sector is embarking on a profound change. In 2019 we became the first major economy in the world to pass laws to end our contribution to global warming and bring all greenhouse gas emissions to net zero by 2050. Over the coming decades, the sector will be transformed to become low carbon, more energy efficient and better connected to help facilitate economy-wide decarbonisation to achieve this target.*

Renewable (or ‘green’) electricity generation technologies such as wind turbines and solar photovoltaics (PV) were first deployed at scale in this country 20 years ago and now account for over 40% of the UK’s electricity mix.<sup>1</sup> This shift has been positively harnessed by energy retailers who offer ‘green electricity’ or ‘100% renewable’ tariffs to their customer base. The availability of these products is increasing rapidly, with over half of all new product offers now marketed in this way.

Green electricity tariffs are seen as an easy step for households and businesses to take on the road to decarbonisation. However, as the availability of green electricity tariffs has grown rapidly, public concerns have been raised regarding the transparency of these types of offers and whether they truly enable customers to engage in the market in a way that supports decarbonisation.

In the December 2020 Energy White Paper (EWP), we committed to “work with industry to reduce the barriers to engagement and ensure consumers are provided with more transparent and accurate information on carbon content when they are choosing their energy services and products”. We want to address transparency challenges within the framework as it exists today, whilst considering the role of green electricity tariffs in a world where renewable and low carbon generation become the predominant form of energy in our mix.

This Call for Evidence is our first step to help us understand the challenges in this area and consider the case for reforming the regulatory framework which underpins green electricity tariffs and some wider environmental carbon accounting schemes.

The Call for Evidence is split into three chapters. **Chapter 1** introduces the key drivers related to the green energy revolution and includes a market analysis of green electricity tariff availability and pricing. **Chapter 2** provides a summary of how green tariffs work and potential areas for consumer harm within the current framework. This chapter introduces the accounting mechanisms used to “match” green energy claims (on a retrospective annualised average) and considers whether there is a role for a more frequent time-based accounting system to better reflect the time at which energy was generated and consumed. **Chapter 3** lays out some of the broader future considerations for this type of framework – a smart and flexible energy system, the emerging market for green gas tariffs and other low carbon technologies like hydrogen.

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<sup>11</sup> BEIS (2020), [DUKES, table 5.6](#)

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# General information

## Why we are consulting

In the December 2020 Energy White Paper, we committed to “work with industry to reduce the barriers to engagement and ensure consumers are provided with more transparent and accurate information on carbon content when they are choosing their energy services and products”.<sup>2</sup>

This Call for Evidence is our first step to help understand the challenges in this area and seek views and supporting evidence on whether a more transparent framework for carbon content of energy services to be communicated to consumers is needed and how such a framework could be designed.

## Consultation details

**Issued:** 16<sup>th</sup> August 2021

**Respond by:** 6<sup>th</sup> December 2021

**Enquiries to:**

Nikki Duggan - Net Zero Consumers Team, Department for Business, Energy and Industrial Strategy  
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**Consultation reference:** Designing a Framework for Transparency of Carbon Content in Energy Products

**Audiences:**

This Call for Evidence will be of interest to consumers, individual energy companies, renewable and low carbon power generators, industry representatives, innovators, third party intermediaries in energy and/or other sectors and consumer and environmental groups.

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<sup>2</sup> <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future>

The Call for Evidence is not limited to these stakeholders; any organisation or individual is welcome to respond.

**Territorial extent:** The territorial scope of this publication is UK wide, with the intention of receiving responses from consumers, industry and other groups from across the four nations, while recognising that energy policy is largely devolved in Northern Ireland and that certain energy associated policy areas are devolved in some jurisdictions, such as the provision of consumer advice and advocacy in relation to gas and electricity or the encouragement of energy efficiency otherwise than by prohibition/regulation.

This publication cites relevant available data and states which of the four nations the data reflects. Where this publication outlines specific energy policy schemes, it will also indicate in which of the four nations the schemes apply.

This Call for Evidence will inform future policy development by government in areas where it is responsible for energy policy and related matters, and engagement with devolved administrations in relation to devolved policy areas.

## How to respond

**Respond online at:** <https://beisgovuk.citizenspace.com/energy-strategy-networks-markets/carbon-content-in-energy-products-cfe>

or

**Email to:** [greentariffs@beis.gov.uk](mailto:greentariffs@beis.gov.uk)

### **Write to:**

Nikki Duggan - Net Zero Consumers Team, Department for Business, Energy and Industrial Strategy  
3rd Floor, Area Abbey 1  
1 Victoria Street  
London  
SW1H 0ET

A response form is available on the GOV.UK consultation page:

<https://www.gov.uk/government/consultations/designing-a-framework-for-transparency-of-carbon-content-in-energy-products-call-for-evidence>

When responding, please state whether you are responding as an individual or representing the views of an organisation.

Your response will be most useful if it is framed in direct response to the questions posed, though further comments and evidence are also welcome.

## Confidentiality and data protection

Information you provide in response to this consultation, including personal information, may be disclosed in accordance with UK legislation (the Freedom of Information Act 2000, the Data Protection Act 2018 and the Environmental Information Regulations 2004).

If you want the information that you provide to be treated as confidential please tell us, but be aware that we cannot guarantee confidentiality in all circumstances. An automatic confidentiality disclaimer generated by your IT system will not be regarded by us as a confidentiality request.

We will process your personal data in accordance with all applicable data protection laws. See our [privacy policy](#).

We will summarise all responses and publish this summary on [GOV.UK](#). The summary will include a list of names or organisations that responded, but not people's personal names, addresses or other contact details.

## Quality assurance

This consultation has been carried out in accordance with the government's [consultation principles](#).

If you have any complaints about the way this consultation has been conducted, please email: [beis.bru@beis.gov.uk](mailto:beis.bru@beis.gov.uk).

# 1. Introduction

## 1.1 The green electricity revolution

*Over the last 20 years we have seen a revolution in green electricity. Renewables now account for over 40% of all electricity generation in the United Kingdom (UK),<sup>3</sup> up from 7% in 2010. This green revolution has been delivered without disruption to the reliability of our electricity supply and the scale of deployment has contributed to a significant reduction in the cost of renewables.*

Our electricity system is constantly adapting and evolving alongside societal and technological developments. 30 years ago, fossil fuels provided nearly 80% of UK electricity supply.<sup>4</sup> Today, the country obtains over half of its power from low-carbon technologies<sup>5</sup>. In the last decade alone, we have seen a 500% increase in the amount of renewable generation capacity connected to the National Grid (the electric power transmission network that transmits electricity from where it is produced to where it is needed in Great Britain (GB))<sup>6</sup>.

The rapid deployment of these technologies has largely been supported by a range of government policy interventions designed to drive investment into renewable electricity generation at scale. This began with the UK-wide Non-Fossil Fuel Obligation<sup>7</sup> (NFFO), just as the market was privatised in 1990. Further interventions such as the UK-wide Renewables Obligation<sup>8</sup> (RO), Feed-in Tariffs (FiT) and Contracts for Difference (CfD) have since been established to support the uptake and deployment of eligible renewable generation technologies – such as onshore/offshore wind, solar, hydro and biomass combined heat and power (CHP). Thanks to early investment, many low-carbon technologies are now cheaper than their fossil fuel counterparts<sup>9</sup>. *See Annex 1 for a more detailed overview of government policy mechanisms used in support of eligible renewable technologies.*

The costs attributed to this infrastructure investment are allocated across all users of the energy system and therefore all consumers have contributed to driving the deployment of these low carbon generation technologies. Infrastructure investment policy funding is one of the six main components of a consumer's energy bill<sup>10</sup> and refers to the mandatory funding of government programmes and schemes to help the energy system become more energy efficient, reduce emissions, and ensure security of supply. Policy-funded investment in

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<sup>3</sup> BEIS (2020), [DUKES, table 5.6](#)

<sup>4</sup> BEIS (2020), [DUKES, table 5.1.3](#)

<sup>5</sup> BEIS (2020), [Energy Trends, table 5.1](#)

<sup>6</sup> BEIS (2020), [Energy Trends table 6.1](#)

<sup>7</sup> In England and Wales this is referred to as the Non-Fossil Fuel Obligation; in Scotland this is referred to as Scottish Renewable Obligation; and in Northern Ireland this is referred to as the Northern Ireland Non-Fossil Fuel Obligation. This CfE uses the term 'Non-Fossil Fuel Obligation' to mean all of these UK obligations.

<sup>8</sup> In England and Wales this is referred to as the Renewables Obligation; in Scotland this is referred to as the Renewables Obligation Scotland; and in Northern Ireland this is referred to as the Northern Ireland Renewables Obligation. This CfE uses the term 'Renewables Obligation' to mean all of the UK ROs.

<sup>9</sup> BEIS (2020), [BEIS Electricity Generation Costs](#)

<sup>10</sup> The 6 main cost components of a consumer's energy bill are – wholesale energy costs, network costs, supplier costs and margins, infrastructure investment policy funding, social policy costs and value added tax.

infrastructure has increased significantly since 2010. For a dual fuel household bill in Great Britain (GB) in 2020, total policy cost recovery was around £220 (18%), compared to less than £100, or 7%, in 2010. Most of this investment has been in the electricity grid<sup>11</sup>.

The UK energy sector is embarking on a profound change. In 2019 we became the first major economy in the world to pass laws to end our contribution to global warming and bring all greenhouse gas emissions to net zero by 2050. The energy we source from renewable and low carbon generation will only continue to grow and this need is hastened by our net zero commitment.

The electricity system has and will continue to play a pivotal role in economy-wide decarbonisation: our modelling suggests electricity usage may double by 2050, driven by increased demand as electricity replaces diesel and petrol to power cars, and more of us use electricity for heating<sup>12</sup>. Decarbonising the energy system over the next thirty years means replacing - as far as it is possible to do so - fossil fuels with low carbon technologies such as renewables, nuclear and hydrogen, alongside a continued push on energy efficiency.

As the amount of renewable and low carbon power on our system continues to grow, we may expect to see increased availability of tariffs that harness this shift to offer ‘100% renewable’ electricity backed tariffs as more homes and businesses want to choose low carbon energy. Improved technological developments, such as smart meters and market wide half hourly settlement may strengthen incentives on suppliers to offer Time of Use (ToU) tariffs that reward customers for using electricity flexibly (i.e., at a time when demand is low) and ensure the system is optimised to make the best use of intermittent renewable generation sources (such as wind and solar) and drive decarbonisation throughout the system.

Achieving net zero emissions will require many of us to take actions to decarbonise our lifestyles and it is crucial that consumers are given transparent information on the carbon content of tariffs to help guide their energy choices. We want to ensure that any tariff regulatory framework can cater for a broad range of customer motivations – from those who want to do more or pay more for decarbonisation, through to the less engaged or more price conscious consumers who want to “do their bit” for the environment at the lowest cost possible.

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<sup>11</sup> BEIS (2021), Call for Evidence on Energy Consumer Funding, Fairness, and Affordability

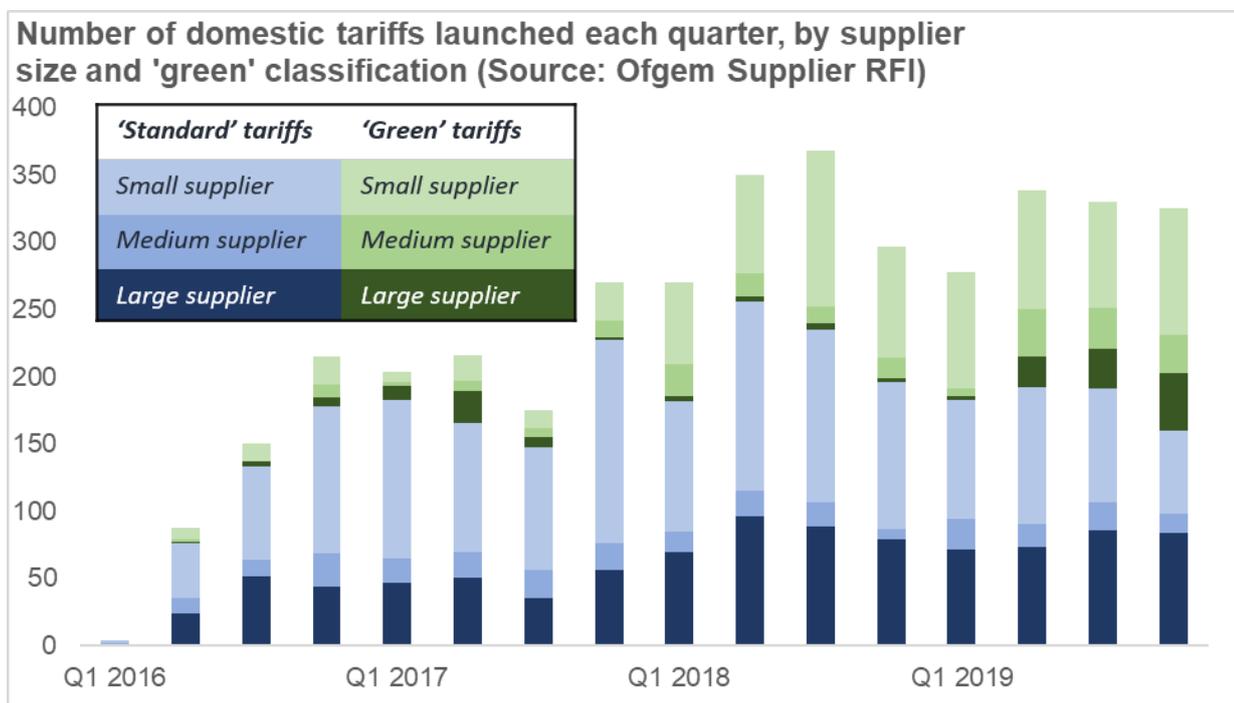
<sup>12</sup> Source: BEIS (2020), [Energy White Paper, Fig 3.2 Electricity Demand – Net Zero Scenarios](#)

## 1.2 The rise of green electricity tariffs

Alongside the revolution in green electricity generation, we have seen a significant increase in the availability of green electricity tariffs marketed to consumers – most notably in the last three years. Green electricity tariffs have now become the most common type of tariff offered to domestic consumers in GB. Figure 1 below provides an overview of domestic tariffs launched each quarter in GB since 2016. While the number of tariffs in general has grown over the period, as the number of suppliers operating in the market increased and regulations on tariff marketing changed, it is also clear that the development of green tariffs has grown more quickly.<sup>13</sup>

Non-domestic consumers are also increasingly interested in sourcing green electricity to meet the call from stakeholders as part of their corporate social responsibility and as part of their growing commitment to meeting net zero. There are already a number of initiatives such as RE 100, a global corporate renewable energy initiative bringing together large and ambitious businesses committed to 100% renewable electricity.<sup>14</sup> The Government has also recently published new procurement requirements for major Government contracts<sup>15</sup> which require bidders to demonstrate they have carbon reduction plans in place.

Figure 1: Number of domestic green electricity tariffs launched each quarter in GB (2016 – 2019)



<sup>13</sup> Ofgem's 'four tariff rule', which restricted the number of tariffs individual suppliers could offer was lifted in Q3 2016

([https://www.ofgem.gov.uk/system/files/docs/2016/08/proposed\\_changes\\_to\\_rmr\\_clearer\\_and\\_sales\\_and\\_marketing\\_licence\\_conditions\\_august\\_2016.pdf](https://www.ofgem.gov.uk/system/files/docs/2016/08/proposed_changes_to_rmr_clearer_and_sales_and_marketing_licence_conditions_august_2016.pdf))

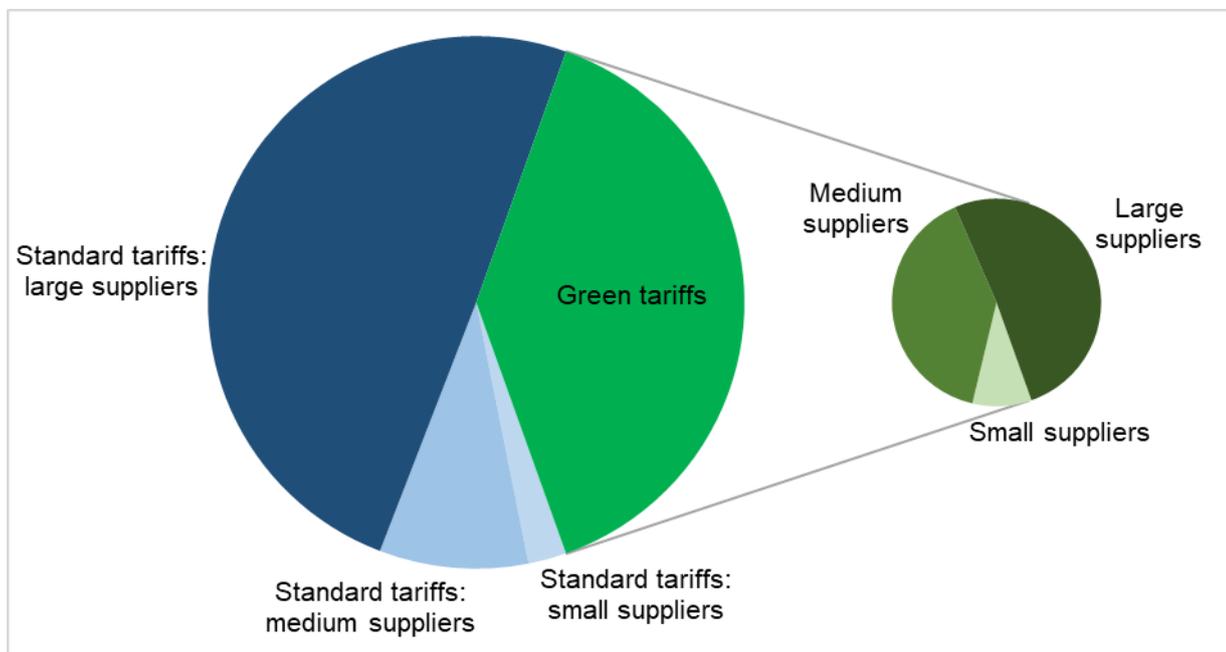
<sup>14</sup> <https://www.there100.org/>

<sup>15</sup> <https://www.gov.uk/government/publications/procurement-policy-note-0621-taking-account-of-carbon-reduction-plans-in-the-procurement-of-major-government-contracts>

Green tariffs became particularly prevalent in GB in 2018. As the overall number of tariffs available grew significantly, green products made up an increasingly large proportion of total available new offers. This trend has continued, and in many instances green electricity tariffs have become the standard offer for many suppliers.

Energy retailers have adapted their brand position and messaging in line with this green electricity revolution. For example, 20 years ago, there was a minority of niche brands positioned around the supply of renewables to consumers – Ecotricity (launched 1995), Green Energy UK (launched 2001) and Good Energy (launched 2003). Today, over a third of licensed electricity suppliers are badged as ‘100% renewable’ and exclusively offer tariffs marketed as backed by green electricity.

*Figure 2: GB domestic market by supplier size and green tariff status, October 2020 (Source: Ofgem supplier RFI)*



### Green tariff pricing has converged and is no longer charged at a premium

As shown in figures 3 and 4 below, historically, many green tariffs in the GB domestic market were priced at a premium to standard tariffs. However, more recently, green tariff pricing appears to have generally converged with standard tariffs across all sizes of supplier. The similarity in price between green and standard tariffs most likely reflects the very small additional costs to suppliers at present of procuring Renewable Energy Guarantees of Origin (REGO), which are used to denote ‘green’ supply. See *Section 2.3 for more information on the REGO Scheme*.

Figure 3: Average GB bill equivalent pricing for 12-month fixed standard and ‘green’ tariffs, 2016-2019 (small and medium suppliers)

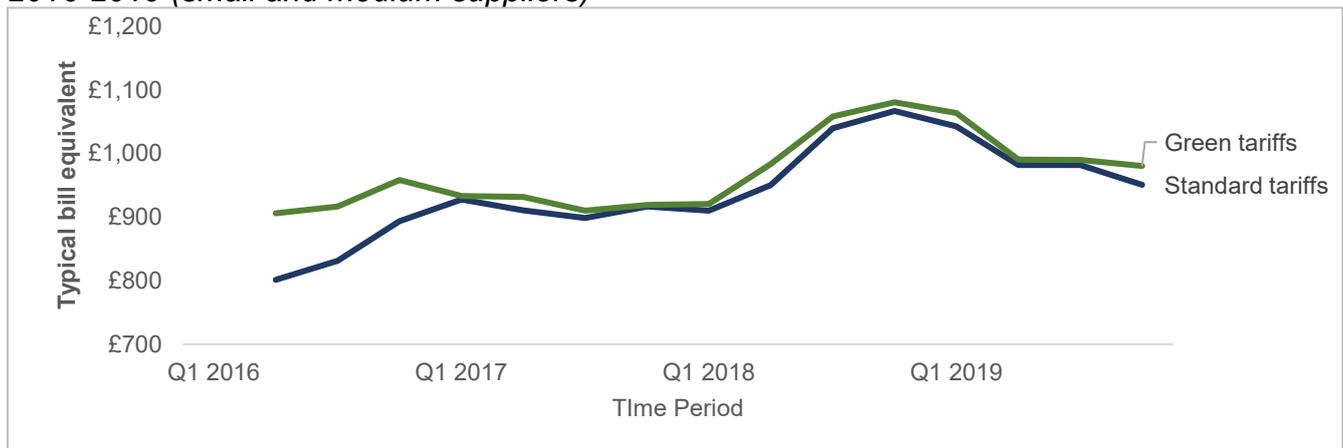
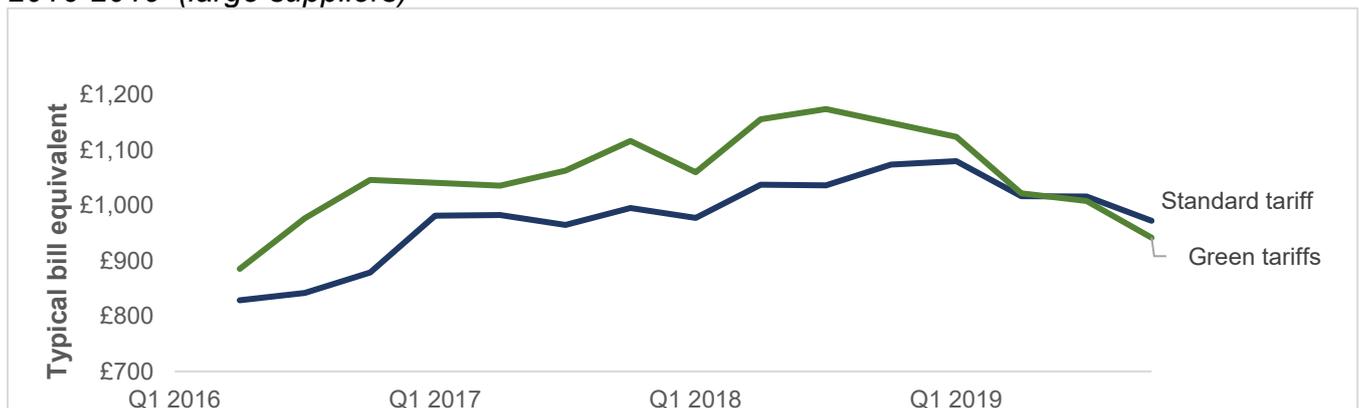


Figure 4: Average GB bill equivalent pricing for 12-month fixed standard and ‘green tariffs, 2016-2019’ (large suppliers)



### Some suppliers offer different kinds of ‘renewable energy’ propositions

In January 2017, Green Energy UK became the first UK supplier to offer a wholesale price-linked Time-of-Use (ToU) tariff to domestic consumers when they launched a product called ‘TIDE’<sup>16</sup>. TIDE unit rates can provide an incentive for consumers to use electricity when the price is cheaper, for example during periods of low demand or when renewable generation is high. Customers are made aware of the different rates and times they apply when they sign up for the tariff. Octopus Energy also have a similar proposition known as ‘Agile Octopus’ which gives consumers access to half-hourly energy rates, tied to wholesale prices which are updated daily<sup>17</sup>. This tariff includes a unique feature known as ‘plunge pricing’ which reflects an abundance of electricity on the grid (i.e., whenever more electricity is generated than consumed, energy prices fall – sometimes to the point where prices drop below zero and suppliers are paid to take energy off the grid.) These events would typically occur at a time of high renewable generation and as such, may encourage ‘green’ behaviour from consumers in

<sup>16</sup> [https://www.greenenergyuk.com/PressRelease.aspx?PRESS\\_RELEASE\\_ID=76](https://www.greenenergyuk.com/PressRelease.aspx?PRESS_RELEASE_ID=76)

<sup>17</sup> <https://octopus.energy/agile/>

that they may adapt household consumption at times when there is a high proportion of electricity available to use which has been generated from renewable sources.

The development of these types of dynamic ToU tariffs is still at an early stage and implementation of market-wide half-hourly settlement in the mid-2020s<sup>18</sup> will put incentives on energy suppliers and other parties to develop new tariffs and innovations that encourage consumers, potentially linked to the data from smart meters, to shift their consumption to times when low carbon electricity is plentiful. These actions will become increasingly important and beneficial to consumers, as electricity demand rises due to the electrification of transport, heat and industrial processes. Consumer flexibility will help reduce the amount of generation and network capacity needed to address the additional demand and meet net zero targets. This, in turn, will reduce costs for all consumers.

Over recent years, we have seen suppliers begin to diversify their offers in relation to renewable electricity even further. For example, the supplier Octopus Energy has launched a product which offers households discounts on their energy bills when local wind turbines are in high generation<sup>19</sup>, and Ripple Energy (in partnership with Co-Op Energy & Octopus Energy) is offering consumers the ability to fund a wind generation site with associated discounts on their energy bills<sup>20</sup>. See *Information Box 1 below for a more detailed overview*.

Our vision is of a system with consumers at its heart, which enables consumers to save on bills or make money through using the new technologies net zero will require. ToU tariffs are one way in which this vision can be realised, and we encourage the development of new, more innovative propositions which shift consumers to use electricity when it is most beneficial to the grid, and in doing so contribute to achieving net zero (i.e., use more at times when there is a high penetration of renewables on the system).

### **Information Box 1: Latest ‘Renewable Energy’ Innovations in Consumer Propositions.**

**Ripple Energy:** *“Part own a new wind farm to power your home with cheap, truly green electricity”*

Ripple was set up in 2017 with the purpose of transforming the ownership of the world’s clean energy assets, enabling consumers to own the generation assets that they rely upon. It aims to give people the power to create the clean energy future they want to see by allowing them to contribute towards the deployment of new wind farms in the UK.

The first project that Ripple has undertaken is the Graig Fatha wind farm, the UK’s first consumer owned wind farm, which is expected to be fully operational in December 2021. It is located near Coedely in South Wales and has a capacity of 2.5MW.

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<sup>18</sup> <https://www.ofgem.gov.uk/publications-and-updates/electricity-retail-market-wide-half-hourly-settlement-decision-and-full-business-case>

<sup>19</sup> <https://octopus.energy/octopus-fan-club/>

<sup>20</sup> <https://rippleenergy.com/>

Consumers choose how many watts of the wind farm they want to own. The minimum is £25 worth, the maximum is the amount that would generate 120% of their annual electricity consumption. Once operational, the consumer's share of the wind farm's renewable electricity is supplied to their home by Ripple's utility partners. For every kWh generated each month, consumers get a saving on their electricity bill. For its first wind farm Ripple partnered with Co-op Energy. For subsequent wind farms Ripple plans to partner with multiple suppliers.

**Octopus Fan Club Tariff:** *“A time-of-use tariff, providing discounted energy to the local community”*

Octopus launched their “Fan Club” tariff in January 2021, which was designed to allow communities to directly benefit from locally sourced renewable energy production in real time. This was facilitated by Octopus Energy's decision to acquire its first two wind turbines, located in Caerphilly, South Wales, and in Market Weighton, Yorkshire, each with 500kW power output.

The tariff itself, the world's first local time-of-use tariff, will offer households living near the turbines bespoke 100% green electricity tariffs whose price varies dependent on wind speeds. Energy consumers who use electricity when the turbines are spinning will receive a 20% discount on the unit price. When wind speeds exceed 8m/s in Market Weighton or 10.8m/s in Caerphilly, respective customers will receive a 50% discount on their energy bills. To receive the maximum cost saving from the tariff, consumers are incentivised to shift their energy use to when electricity generation from the turbines is at its greatest.

Consumers can check the rate that they are paying online in real time in addition to seeing forecast wind speeds to further assist in shifting consumption.

## 2. Context

### 2.1 How do green electricity tariffs work?

*Green electricity tariffs refer to a category of product offered by energy retailers. These tariffs are promoted on the basis of having a positive environmental impact and can often include additional climate benefits such as carbon offsetting or donations to low carbon community generation projects.*

#### 100% Renewable Electricity Tariffs

Green electricity tariffs are marketed as being backed by energy produced solely from renewable sources – today this includes electricity generated from onshore and offshore wind, solar, hydro and biomass. An energy supplier cannot control the source of the electricity to ensure it supplies only ‘green’ energy to a home or business. Electricity is mainly supplied from the transmission grid, into which generation from all sources is fed. *See Information Box 2 – ‘The Energy Smoothie’ below for more information.* So green electricity tariffs work by having a supplier ‘match’ the energy consumed by their customers with energy generated from renewable sources on an average annualised basis. *See Information Box 3 for an overview of how a generator sells their electricity to suppliers.* This ‘matching’ is facilitated via the use of Energy Attribute Certificates (EACs) known as ‘Renewable Energy Guarantees of Origin’ (REGO) certificates which are designed to prove the origin of each MWh of energy generated from eligible renewable sources and includes other relevant attributes – such as generation station location. *See Section 2.3 for more information on the REGO Scheme.*

#### **Information Box 2: ‘The Energy Smoothie’ – How does green energy get to a home or business?**

Most homes and businesses in GB receive some or all of their power from one of the licensed energy suppliers, which buy electricity from generators and then sell it on to consumers. The electricity we use doesn’t just flow through a single overhead line or underground cable from a power station directly to a home or business. It travels from where it is generated through the transmission system, which is made up of high voltage electricity wires, into premises across GB. The transmission system is run by National Grid ESO and local distribution network operators.

Apart from off-grid installations like solar panels on buildings or ‘direct wire’ sites, all the electricity generated by different sources around the country goes into this same system. It means electricity generated by solar panels or a wind turbine is mixed up with the electricity generated by a nuclear reactor or a coal fired power station.

A simple analogy is to consider the electricity system like a ‘smoothie’ with the various forms of generation, represented by different fruits. For example, solar power could be ‘apples’ and gas power could be ‘bananas’ which are all feeding into the same ‘smoothie’ mix. In this analogy, electricity (or ‘fruit’) from various generators (different types of ‘fruit’

for different types of generation) is fed into a central transmission system (or ‘smoothie’), which is then distributed to homes and businesses across GB.

Suppliers can’t control exactly which type of ‘fruit’ are sent to a single premise; we all get a mix of the ‘smoothie’. As explored in *Annex 1- Government Policy Mechanisms Used in Support of Eligible Renewable Generation Technologies*, the availability of different ‘fruits’ (e.g., electricity generated by different renewable sources) is, for the main part, driven by policy interventions to drive investment – which all users of the system pay a share towards. But one way that suppliers can influence the makeup of ‘fruits’ which go into the ‘smoothie’ is by the commercial routes through which they choose to invest in different generation technologies and what electricity they agree to buy and offer to their customers. *These commercial routes are explored further in Information Box 3: ‘How does a generator sell their electricity to suppliers?’*

### Wider Environmental Claims

As well as being ‘100% renewable’ these tariffs are typically promoted on the basis of providing some form of environmental benefit – for example, “by taking a 100% renewable electricity tariff you are lowering your personal carbon emissions by XXXkg CO<sub>2</sub>e per year compared to a typical home in the UK. That’s the equivalent of taking XX cars off the road”. This benefit is often expressed as an annual kg CO<sub>2</sub>e saving compared to a home which is not supplied on a green electricity tariff. In GB, this is referred to as a “claimed environmental benefit”.

Green electricity tariffs are partially regulated in GB by Ofgem<sup>21</sup> under Standard Licence Condition 21D<sup>22</sup> (SLC 21D) of the Electricity Supply Licence, which places requirements on suppliers who claim that there is an environmental benefit to a tariff as a result of supplying renewable electricity<sup>23</sup>. When making such a claim, SLC 21D imposes specific requirements which are outlined further below.

### Supply Licence Condition 21D

In summary, green electricity tariffs in GB work by having a retrospective annual compliance process in place where suppliers can provide evidence to the regulator that they have ‘matched’ the volume of energy supplied to green tariff consumers with energy generated from renewable sources. This ‘matching’ is evidenced using REGO certificates. Suppliers are also required to substantiate any specific claims regarding environmental benefits associated with the tariff choice (e.g., Kg CO<sub>2</sub>e saving). This is enforced in GB via supply licence condition 21D which details conditions for compliance in three areas: i) evidence of supply, ii) additionality and iii) transparency.

### Evidence of Supply

SLC 21D permits retail suppliers to claim that the energy they supply to domestic consumers is ‘100% renewable’ or ‘green’ by evidencing to the regulator, Ofgem, that they have ‘matched’

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<sup>21</sup> The regulator in Northern Ireland is the Utility Regulator.

<sup>22</sup> <https://www.ofgem.gov.uk/publications-and-updates/standard-conditions-electricity-supply-licence>

<sup>23</sup> As claimed in any advertising, marketing or communication with the consumer concerning their tariff choice

the volume of energy supplied to their green tariff customers' with energy generated from renewable sources. See *Information Box 3 for an overview of the various ways a generator may sell their electricity to suppliers.*

This “matching” is administered using the REGO scheme<sup>24</sup> whereby suppliers claim the requisite amount of REGO certificates to match the amount of energy supplied to their green tariff customer base. See *Section 2.3 for more information on the REGO scheme.*

### **Additionality**

Suppliers are required to substantiate the claimed environmental benefit is a result of consumers choosing to purchase the tariff in question and not solely brought about because of government subsidies, obligations or other mandatory mechanisms.

As outlined in ‘*Section 1.1 – The Green Electricity Revolution*’, policy mechanisms designed to drive investment in eligible renewable generation technologies have, to date, been the primary drivers to stimulate the amount of renewable energy available in our energy system. However, suppliers can also play some part in influencing this mix by the commercial relationships and routes through which they choose to buy their energy. This concept is known as ‘additionality’ and in this context refers to the extent to which a consumer’s choice to take a green electricity tariff can itself drive investment in renewable generation technologies. For example, the energy suppliers Good Energy, Green Energy UK and Ecotricity have all been granted enduring derogations from the default tariff cap<sup>25</sup> by evidencing how their green electricity standard variable tariffs support additional investment in green infrastructure to a materially greater extent than existing government support schemes.

### **Transparency**

Where a supplier cannot ensure the claimed environmental benefit is because of a customers’ choice to purchase the tariff in question, they are obligated to publish a clear statement to the effect that purchasing the tariff in question will not produce the claimed environmental benefit. The supplier must ensure that the statement is published prominently and in close proximity to the claimed environmental benefit.

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<sup>24</sup> <https://www.ofgem.gov.uk/environmental-programmes/rego/about-rego-scheme>

<sup>25</sup> The default tariff cap was introduced on 1 January 2019 to place an upper bound on the price suppliers can charge domestic consumers on a standard variable energy tariff (SVT) or a default tariff (a tariff a supplier applies if a consumer has not chosen any other tariff). Derogations from the default tariff cap have been granted by Ofgem for certain tariffs according to a specific set of criteria set out in Ofgem guidance: <https://www.ofgem.gov.uk/publications-and-updates/guidance-derogation-requests-renewable-tariffs-default-tariff-cap>. The criteria are designed to incentivise suppliers to support investment in green infrastructure outside of existing government support schemes.

## 2.2 Other ways for consumers to compare a supplier's environmental credentials

Customers are also able to compare the environmental credentials of their supplier by ascertaining the proportion of energy they have procured from renewable sources.

Supply Licence Condition 21 (SLC 21<sup>26</sup>) places an obligation on GB retailers to evidence the proportion of energy they have sourced from renewable generation on an annual basis, through a process called Fuel Mix Disclosure (FMD)<sup>27</sup>.

This disclosure is then made available to customers through relevant billing information and promotional material. The obligation to disclose each supplier's fuel mix was implemented in 2005 as part of the EU's 'Consumer Agenda' for energy with the intention that 'the provision of information on the fuel mix of electricity should enable consumers to make informed choices about the environmental impact of the electricity they buy'. Consequently, the implication was that, once furnished with the information, consumers may select more efficient and environmentally friendly power sources<sup>28</sup>. See Fig. 5 for an example of FMD.

Energy Source	Supplier			
	Green Tariff	All other tariffs	Total Fuel Mix	UK Fuel Mix
Coal	0%	6%	4%	4%
Natural Gas	0%	55%	49%	39%
Nuclear	0%	10%	9%	17%
Renewable	100%	23%	33%	38%
Other Fuels	0%	6%	5%	2%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
Environmental Impact				
CO2 Emissions	0g per KWh	300g per KWh	250g per KWh	198g per KWh
High Level Radioactive Waste	0g per KWh	0.006g per KWh	0.005g per KWh	0.007g per KWh

Figure 5 – FMD Example

### Sustainability Reporting

Currently, the UK Government provides incentives for the use of sustainable biomass for the generation of renewable power, heat, and transport fuels. As a result of these policies, according to most recent published statistics, bioenergy accounts for 7.3% of total energy

<sup>26</sup> <https://www.ofgem.gov.uk/publications-and-updates/standard-conditions-electricity-supply-licence>

<sup>27</sup> <https://www.legislation.gov.uk/ukxi/2005/391/contents/made>

<sup>28</sup> <https://www.gov.uk/government/publications/final-regulatory-impact-assessment-implementation-of-the-fuel-disclosure-provision-on-the-internal-market-in-electricity>

consumption in the UK with the majority (62%) being used in power generation. Government is also considering the role for sustainable biomass in achieving net zero<sup>29</sup>.

There are sustainability reporting criteria that need to be met to qualify for the financial incentive – for example the RO requires reporting on the land from which the biomass is sourced and the lifecycle GHG emissions of the biomass which allow generators to demonstrate they are only using sustainable biomass.

## 2.3 The Renewable Energy Guarantees of Origin (REGO) scheme

When it comes to choosing where your electricity comes from, the situation is not as straightforward as sourcing physical products such as fruit, simply because all power generated by different sources is fed into the same transmission grid where electrical energy from different sources cannot be distinguished (*see Information Box 2 ‘the energy smoothie’ for more information*). As all electricity generated is fed into the GB ‘fuel mix’ in GB and the electricity transmission grid ‘fuel mix’ in Northern Ireland, a means of accounting for and tracking the amount of renewable energy generated on the system is required. This accounting system works by separating the environmental attributes of electricity from physical power delivery to enable owners to ‘claim’ that unit of energy as the source of their own consumption, and in doing so provides an audit trail to prove the origin of each MWh of electricity generated from eligible renewable sources and which supplier has ‘claimed’ this (i.e., allocated as supplied to a consumer premises) within the electricity system.

This process of ‘matching’ renewable generation to each supplier is facilitated by the REGO Scheme<sup>30</sup>, which is administered in GB and Northern Ireland (NI) by Ofgem.

### Background context

The REGO scheme was established in 2003 as an accounting mechanism to track eligible renewable electricity generation across the European Union (EU)<sup>31</sup>. It was set up in advance of the FMD reporting obligation, to provide the underpinning framework for environmental disclosures to be evidenced to consumers. It built on an existing scheme in the UK, where Levy Exemption Certificates (LEC) were provided for each megawatt hour (MWh) to renewable generators to evidence differential treatment for renewable electricity under the Climate Change Levy which was introduced in 2001. LECs were traded separately to the power, enabling the green element of power generation from eligible renewables sources to attract value in addition to the physical power.

EU Member States were required to ensure that the origin of electricity produced from renewable sources could be guaranteed as such according to objective, transparent and non –

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<sup>29</sup> <https://www.gov.uk/government/consultations/role-of-biomass-in-achieving-net-zero-call-for-evidence>

<sup>30</sup> <https://www.ofgem.gov.uk/environmental-programmes/rego/about-rego-scheme>

<sup>31</sup> <https://www.legislation.gov.uk/uksi/2010/2715/made>

discriminatory criteria<sup>32</sup>. This led to the standardisation of an Energy Attribute Certificate (EAC) – known in GB and Northern Ireland as a “REGO certificate” – which was designed to provide information about the origin and environmental attributes of one MWh of electricity, generated by a registered renewable plant. *Note: whilst the terminology used in GB and NI is “REGO”, in EU Member States these certificates are referred to as “Guarantees of Origin (GoO) certificates”.*

Information on REGO certificates is available through the public reports section of a register, administered by Ofgem<sup>33</sup>. *See Annex 2 for an overview of REGO applications.*

REGO certificates are issued by Ofgem to the generator and can be traded alongside the relevant electricity trading contracts (known as a ‘bundled’ trade), or traded separately from the physical power as standalone certificate entities (‘unbundled’ trade). *See Information Box 3: ‘How does a generator sell their electricity to suppliers?’ for more information.*

### **Information Box 3: How does a generator sell their electricity to suppliers?**

There are three main routes for generators to sell their electricity to licensed suppliers, these are:

#### **Owned Generation**

- 1 The supplier has acquired its own generating assets, such as wind farms. In this case, the supplier can directly source electricity to supply its consumer base. If this energy is to be used for their green electricity tariff customer base, the supplier would claim relevant REGO certificates issued to the generation station on the register to evidence this supply has been delivered to green tariff customers.

#### **Power Purchase Agreement (PPA)**

- 2 Alternatively, the generator can choose to enter a contract, known as a PPA, with a supplier. A PPA is a contract which defines the commercial terms for the sale of electricity between the buyer and seller, including details such as when the project will begin commercial operation, schedule for delivery of electricity, penalties for under-delivery, payment terms, and termination. This provides the generator with a guaranteed revenue stream, price certainty and reduces their exposure to volatility in wholesale market prices.

In either of the above scenarios, it is likely that the supplier would claim from the generator the relevant REGO certificate for associated generation (i.e., a bundled trade) and submit this as part of their annual FMD reporting obligation. If the supplier purchased the electricity but did not claim the REGO certificates, they would not be able to claim the electricity as renewable. Only the party which buys the REGO certificate is able to evidence this claim.

<sup>32</sup> [http://www.legislation.gov.uk/ukxi/2010/2715/pdfs/ukxiem\\_20102715\\_en.pdf](http://www.legislation.gov.uk/ukxi/2010/2715/pdfs/ukxiem_20102715_en.pdf)

<sup>33</sup> Other countries in Europe have appointed different administrators (i.e. Network companies).

Generators can also trade unclaimed REGO certificates separately from the electricity to which they relate. Only REGO certificates which have not been 'claimed' elsewhere in the system can be traded (i.e., those which have not already been sold to evidence another supplier's FMD disclosure or a company's GHG Scope 2 Protocol reporting). The generator would be able to sell unclaimed REGO certificates on the secondary market for another supplier to buy (i.e., if the supplier had procured energy from the wholesale market they would need to buy unclaimed REGOs to evidence renewables).

### Wholesale Market Trading

- 3 If a generator chooses not to directly contract the electricity it generates to a supplier, they may also opt to sell this on the wholesale market. Some generators may choose to do this where it is not within their commercial operations to manage multiple PPAs and they require a readily available route to market for their power (i.e., project is already financed). A supplier can then purchase unclaimed REGO certificates separately to evidence its claim that its energy is renewable. The wholesale market may encompass generation from a variety of sources – fossil fuel, renewables and low carbon power.

## REGOs / GOOs and EU Exit

Guarantee of Origin Certificates (GOOs) are the EU equivalent of REGO certificates. GB and NI currently recognise GOOs for renewable energy or high-efficiency cogeneration issued in EU countries, despite the UK having left the EU. This allows electricity suppliers in the UK to continue to use both EU GOOs and those issued in GB and NI to comply with their fuel mix disclosure obligations and ensure that existing supply contracts are not compromised, in so far as these contracts depend upon GOOs. GOOs issued in GB and NI are no longer recognised in the EU. The Government has committed to review this position so that, longer term, domestic recognition of GOOs issued in EU countries will take place only on a reciprocal basis. Any proposed changes to the use of REGO certificates or relevant legislation will be consulted on at the appropriate time.

## 2.4 Green electricity tariffs and the potential for consumer harm

### Do green electricity tariffs match customer expectations?

Public concern about climate change is rising; in our latest Public Attitudes Tracker, 8 in 10 people said they were very or fairly concerned about climate change<sup>34</sup>. Now, more than ever consumer attitudes place sustainability at the forefront of purchasing decisions – with over three-fifths (62%) of UK energy consumers stating that they are more likely to purchase a product or service that is sustainable, and over 40% of under 35s stating that they are willing to pay a premium for sustainable energy<sup>35</sup>. In addition, a small but significant proportion of energy

<sup>34</sup> BEIS, Public Attitudes Tracker Wave 37, May 2021.

<sup>35</sup> [https://www.ey.com/en\\_uk/news/2021/02/uk-energy-consumers-ready-to-flick-the-switch-to-more-sustainable-suppliers-but-green-tariffs-alone-are-not-enough-to-stand-out](https://www.ey.com/en_uk/news/2021/02/uk-energy-consumers-ready-to-flick-the-switch-to-more-sustainable-suppliers-but-green-tariffs-alone-are-not-enough-to-stand-out)

consumers (13%) say that their primary reason for switching supplier was for sustainability-related reasons<sup>36</sup> – a growing trend which evidences the rising importance of these factors in customer decision making.

Green electricity tariffs are seen as an easy step for households and businesses to make on the road to decarbonisation. However, as the availability of green electricity tariffs has grown rapidly, public concerns have been raised regarding the transparency of these types of offers and whether they truly enable customers to engage in the market in a way that supports decarbonisation:

*“Renewable electricity tariffs are growing in popularity, and no wonder as we all strive to cut our carbon footprint and play our part in saving the planet. But are these tariffs as green as you might expect? Our research reveals that many companies selling renewable electricity aren’t doing what customers presume. Some companies do buy directly from generators, or build wind or solar farms, but many don’t... Companies’ marketing material, price comparison websites, staff on the phone, and even rules from energy regulator Ofgem aren’t helping customers understand different types of renewable tariff so they can buy what they expect.”*

(Source: Which? ‘How green is your energy tariff?’<sup>37</sup>, 2019)

*“Renewable or ‘green’ energy tariffs are increasingly popular, as more and more consumers seek to play a role in tackling climate change. It is critical that consumers can trust that tariffs marketed as green will in fact make the expected positive impact for the planet, for example by stimulating additional investment in renewable generation. We are aware of growing concerns about ‘greenwashing’, where the environmental impact of a particular tariff or supplier is overstated. We expect suppliers to be transparent about what constitutes a ‘green tariff’ and we will undertake work to ensure that consumers are not misled.”*

(Source: Ofgem, Decarbonisation Action Plan<sup>38</sup>, 2020)

### Concerns about ‘greenwashing’

In general, ‘greenwashing’ refers to the practice of overemphasising a company’s environmental credentials, typically by misinforming the public or understating potentially harmful activity.

In the context of green tariffs, a particular point of controversy is the extent to which a consumer may be misinformed as to ‘environmental benefit’ of their energy choices (i.e. ‘By choosing green energy you are saving XXXkg CO<sub>2</sub>e compared to a typical home’). As we have explored in preceding sections, policy mechanisms such as RO, FIT and CFDs have been the primary drivers to increase proportion of renewable electricity on the grid – which all users of the system have already paid a share towards as infrastructure investment policy costs. With the exception of the three suppliers that have been granted derogations from the default tariff cap (by evidencing that their green electricity standard variable tariffs support additional

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<sup>36</sup> [Consumer action monitor report | Ombudsman Services \(ombudsman-services.org\), 2021.](https://www.which.co.uk/news/2019/09/how-green-is-your-energy-tariff)

<sup>37</sup> <https://www.which.co.uk/news/2019/09/how-green-is-your-energy-tariff>

<sup>38</sup> <https://www.ofgem.gov.uk/publications-and-updates/ofgem-s-decarbonisation-action-plan>

investment in green infrastructure to a materially greater extent than existing government support schemes), a customer's choice to select a green tariff is unlikely to have a material bearing on the amount of renewable energy in the national mix. Therefore, the assumed environmental benefit (quantified as kg CO<sub>2</sub>e) is likely to still be present in the system regardless of whether a customer selected the tariff.

A further criticism of the green electricity tariffs today is that a supplier can badge a tariff as '100% renewable' without 'directly' procuring renewable energy on behalf of their customer base. As outlined in Information Box 3, a renewables generator may sell their electricity through a variety of means – either directly or through the wholesale market. A supplier can then badge the electricity as renewable if they have purchased sufficient REGO certificates. Some critics state the latter is a form of 'greenwashing' as electricity purchased from the wholesale market will be a mixture of fossil fuel, low carbon and renewable electricity. As we have explored in preceding sections, REGO certificates are only issued against electricity generated and therefore cannot be 'double counted' as consumed within the system (i.e., if a generator chooses to sell their electricity via the wholesale market and associated REGOs elsewhere).

### REGO certificates as a basis for 'matching' consumption

REGO certificates are intended to track the attributes of a given unit of renewable energy from the generator to the consumer - providing information and transparency about the energy the generator is selling and which the consumer, through their energy supply, is ultimately buying. Given the rising importance of time granularity in electricity supply, the lack of such a feature (to reflect the time energy was generated or consumed) in the existing REGO system may present a particular challenge to providing consumers with transparent information.

The GB electricity system is kept in balance by matching electricity generation and consumption at all times. National Grid Electricity System Operator (NG ESO) manage this real-time balancing, and electricity market participants are required to match demand and supply on a half hourly basis (or 'settlement period').

In contrast, REGO certificates are currently issued against each MWh of output generation and redeemed annually as part of a GB supplier's green tariff and/or FMD evidence disclosure under supply licence conditions 21D and 21 respectively. This underpinning "framework" was implemented almost 20 years ago and was not designed in a way to create strong links between production and consumption within the existing system for tracking renewable energy. A customer on a green tariff using electricity at a time when renewable energy is relatively scarce (for example at a dinner time on a weekday in winter with low wind level) may have their consumption "matched" to a REGO certificate for the output of a windfarm at any time during the preceding 12 months (for example during a sunny and breezy Sunday morning in summer).

As net zero requires smarter and more flexible energy solutions, it is vital we have a transparent accounting system which better reflects the physical realities of the electricity grid and creates stronger customer incentives to make the most of low carbon generation when it is

most needed. When REGO certificates were first implemented, renewable electricity made up less than 2% of our national mix and fossil fuels were the predominant form of generation. The framework was not designed in a way to distinguish between the different types of generation now in the energy market (and their associated carbon content) or to provide consumers with information to play their part in net zero decarbonisation.

We want to create a framework which is fit for our smart energy system and caters for the broadest range of consumers – ranging from the most eco conscious who are willing to pay more for ‘additionality’ right through to those who want to ‘do their bit’ and limit their environmental impact in the most economical way possible. We want to work with industry participants, consumer groups and other interested parties to understand how best this could be achieved.

Increasing the time granularity of the matching system can be beneficial when higher penetration of renewables in the system is reached by stimulating the synchronisation of demand with renewable energy production. *See Information Box 5 for a Case Study example of where a “real time” (i.e. hourly) matching system has been used.*

**Q1: Does the current approach of retrospective annualised matching (using REGO certificates) provide a sufficient level of consumer transparency? Please provide reasons.**

**Q2: Can you provide any evidence on your commercial experiences with PPAs for renewable energy? For example – availability, commercial competitiveness etc.**

**Q3: Can you provide any evidence on operational issues or other challenges that may materially limit a supplier’s ability to offer PPA backed green electricity tariffs? For example, how do you balance forecasting of consumers usage vs the need to settle on a half hourly basis?**

**Q4: Can you provide any insights or evidence as to the role REGO certificates play in financing and commercial decision making?**

**Q5: How can green tariffs be regulated to enable consumer choice to drive additional investment in low carbon electricity generation? Please provide reasons.**

**Q6: Should the ability to report emissions using both market-based and location-based emission factors be maintained, and if so, should there be a requirement to report both side by side in corporate reporting?**

### **Information Box 5 - International examples of reforms to improve transparency.**

M-RETS and Google in US – Hourly renewable energy certificates (or ‘renewables 24/7’)

In September 2020, Google announced their intention to operate entirely on 24/7 Carbon Free Energy (CFE). This commitment builds on over 14 years of work to address the carbon impacts of their electricity consumption: Google became carbon neutral in 2007

and since 2017 they have matched 100% of their annual, global electricity consumption with renewable energy purchases evidenced by renewable energy certificates (REC – a US form of EAC). Google now wants to bolster this commitment to ensure they are powered by renewable energy 24/7 and this can only be evidenced by moving to a more frequent time-based certification system (i.e., hourly to better reflect the physical realities of the electricity system). They are working up an early concept trial with M-RETS to establish this approach.

M-RETS, a renewable energy tracking platform in the US has worked with Google to complete the first ever hourly REC claim in January 2021. This innovative approach to RECs hopes to use available data to increase transparency for consumers and stimulate additional investment to drive decarbonisation in energy markets.

In their first phase, the aim was to provide REC markets with access to hourly generation data by including it as an additional characteristic of the existing REC framework.

Whilst M-RETS have built hourly generation into the REC retirement process, and the system is able to validate that a batch of RECs have not been split after being issued (to avoid double counting), hourly RECs are not currently issued (because of market limitations, rather than technical barriers). They recognise, however, that there are significant further steps that could be taken such as issuing hourly RECs or enabling batches to be split up into hourly increments.

M-RETS discuss, on the one hand, the benefits of hourly load matching in sending more efficient signals to the market; on the other hand, they highlight the challenges of issuing hourly RECs. They suggest that RECs for certain hours of high energy demand (e.g. business hours) will become more valuable. Whilst this may be the desired outcome as such price signals drive investment in generation at the hours when demand is highest, it nonetheless makes it more complex. This risks disincentivising project financiers and reducing the additionality possible.

The future phases of M-RETS work seeks to provide further access to granulated energy market and in Q3 and Q4 2021 they are engaging with stakeholders to determine how to manage the full timeline of hourly RECs to support more specialised claims, to decide whether REC batches should be split up and transacted in hourly or smaller divisions. In Q1 and Q2 of 2022, M-RETS will provide the system for more specific hourly claims to also include carbon data and how decarbonisation efforts can be quantified for the benefit of consumers.

The lack of understanding of the “retrospective annualised matching” principle underlying REGO schemes may continue to foster confusion and distrust from consumers who are aware that renewable generation is not always available when their electricity consumption occurs (i.e., how is a home powered overnight with solar energy, and how does the matching deal with storage?).

Consumer trust is vital and increasing the granularity of information is a way of increasing transparency and addressing consumer confidence.

Information initiatives alone may have limited success and the regulation of green tariffs must cater for a broad range of customer motivations. Ofgem carried out research in February 2020 to better understand customer perceptions of green tariffs in both the domestic and non-domestic space (primarily small or micro-businesses<sup>39</sup>). The key findings noted that, while domestic and non-domestic customers wanted to “do their bit” for the environment, both groups found it difficult to verify environmental claims. Customers were unsure about how a green tariff benefits the environment and considered there was no single trusted resource to check claims. Most customers expressed a low appetite for detailed information about their tariff or the intricacies of how it worked. Customers wanted a simple explanation that described how choosing the tariff would help the environment. The most common piece of information called for was the percentage of the customer’s energy consumption that had been matched to renewable energy generation, with green conscious consumers (those who considered the green credentials of an energy tariff when choosing it) expecting green tariffs to be 100% renewable or carbon neutral.

**Q7: Can you provide any evidence regarding the types of messages associated with green electricity tariffs that you believe to be misleading to consumers?**

**Q8: Can you provide any evidence as to the type of interventions or remedies (including international best practice approaches) which may help achieve greater transparency in green electricity tariffs?**

### The role of consumers in achieving net zero

Achieving net zero emissions will require many of us to take actions to decarbonise our lifestyles and it is crucial that consumers are given transparent information on the carbon content of tariffs to help guide their energy choices. Some want to make their own financial contribution to decarbonisation by choosing to use energy sources that are low-carbon or renewable. Some may be more price conscious but still want to play a part in decarbonisation. Others will not have made an active choice to ‘switch’ to green (as their supplier may have made this choice for them by moving to ‘100% renewable as standard’ across all their products). We need to ensure consumers are protected and can trust the information they are provided.

**Q9: How best do you think the carbon content of energy supplied to a home or business consumer could be made more transparent to consumers?**

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<sup>39</sup> This was facilitated by interviewing a sample of 36 participants to discuss their decision-making process behind choosing an energy tariff.

### **Information Box 6: Principles Based Guidance to Prevent Misleading Green Claims**

The Competition and Markets Authority (CMA) is undertaking activity to develop principles-based guidance to prevent misleading green claims across a wide range of sectors – such as travel, cosmetics and energy<sup>40</sup>.

Based on its own research and evidence from other enforcement authorities, the CMA is concerned that this surge in demand for green products and services could incentivise some businesses to make misleading, vague or false claims about the sustainability or environmental impact of the things they sell.

This new programme of work is a response to the growing number of products and services being marketed as environmentally friendly, as awareness of environmental issues increases. In 2019, UK consumers spent £41 billion on ethical goods and services – almost four times as much as they spent two decades ago.

Examples of misleading behaviour could include:

- exaggerating the positive environmental impact of a product or service
- using complex or jargon-heavy language
- implying that items are eco-friendly through packaging and logos when this is untrue

The CMA is looking across a wide range of sectors to better understand the impact of green marketing on consumers, and how consumer protection legislation can be used to tackle false or misleading environmental claims.

In particular, it is focusing on:

- how claims about the environmental impact of products and services are made
- whether such claims are supported by evidence
- whether such claims influence consumer behaviour when purchasing such goods and services
- whether consumers are misled by an absence of information about the environmental impact of products and services

The CMA will produce guidance for businesses on how they can best be transparent in the way that they market goods and services in relation to any claims made about environmental impact. We will consider this guidance when it is published later this year.

<sup>40</sup> <https://www.gov.uk/cma-cases/misleading-environmental-claims>

### 3. A framework fit for the future

*Low carbon electricity will become the predominant form of energy, entailing a potential doubling of electricity demand and consequently a fourfold increase in low-carbon electricity generation, as we increasingly electrify transport and heat.*

The switch to net zero electricity has particularly profound implications. Separate networks for electricity, gas for heating and petrol for diesel for cars or vans, which today run independently of each other, will increasingly merge into one system, as electricity becomes the new common currency.

It will require a new approach to how the energy system is managed and the ways in which consumers can choose to play a part to help achieve net zero. Developments such as market-wide half-hourly settlement<sup>41</sup> (enabled by the smart meter rollout) will facilitate a smarter, more flexible energy system, by providing incentives for consumers to use energy at times of low demand. Consumers will be further encouraged to manage their energy use better and be rewarded for consuming and exporting electricity at times which are beneficial for the system.

Green electricity tariffs have been a market feature for over two decades now, and as we transition to clean power, it is imperative that they can evolve to reflect the changing needs of our system, driven by the net zero target.

The UK's energy system is one of the most developed and successful anywhere in the world. It was designed and built for the age of fossil fuels which, even today, are predominant in final energy use. Though fossil fuel [generation?] (primarily petroleum products and natural gas) is now at record low levels, it still accounted for just over 79% of UK energy supply in 2019, with electricity representing only 17% of final energy use by consumers<sup>42</sup>.

This dependency on fossil fuels will change dramatically over the next 30 years. By 2050, electricity could provide over half of final energy demand, as it displaces petrol and diesel in cars and light vehicles and, to some degree, gas for heat in homes. As we set out in the Energy White Paper, this could mean that electricity demand doubles from today's 345TWh<sup>43</sup>.

Achieving net zero will require many of us to take actions to decarbonise our lifestyles and any regulatory framework for tariffs and green claims must cater for a broad range of customer motivations – from those who want to do more or pay more for decarbonisation, through to the less engaged or more price conscious consumers who want to “do their bit” for the environment at the lowest cost possible. Our vision is of a system with consumers at its heart, where consumers are able to save on bills or make money through using the new technologies net zero will require. This approach means not just deploying measures that save energy and

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<sup>41</sup> <https://www.ofgem.gov.uk/electricity/retail-market/market-review-and-reform/smarter-markets-programme/electricity-settlement-reform>

<sup>42</sup> <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future/energy-white-paper-powering-our-net-zero-future-accessible-html-version#fn:93>

<sup>43</sup> <https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future/energy-white-paper-powering-our-net-zero-future-accessible-html-version#fn:94>

reduce costs, but also: ensuring the energy system is fit for a net zero world; making markets efficient; incentivising people to move to low carbon energy; and making sure system rules are agile and flexible to accommodate new technologies and new ways of doing things.

To help guide consumers net zero choices we need a transparent framework that allows them to easily understand the carbon and cost implications of their energy choices. This section lays out some of the future considerations we may need to address as the framework evolves from green to encompass other forms of low carbon technologies in support of net zero.

### 3.1 A smart and flexible system

As we leave fossil fuels behind us and increasingly rely on clean electricity, our experiences as energy consumers will be very different. Smart technologies are revolutionising how we can engage in the market. Smart meters and a range of smart appliances, backed by new smart tariffs (and market-wide half-hourly settlement<sup>44</sup>), will give us control about how we use energy and help us manage our bills – running the washing machine or charging the electric vehicle when demand is low and electricity is cheap, even selling surplus power back to the grid at a profit. This concept is referred to as ‘system flexibility’. We need open, competitive markets which harness the full value of flexibility and our latest vision for this area will be published shortly as part of the joint ‘Smart Systems Plan’ with Ofgem.

Perhaps the most decarbonising tariffs of the future will be renewable backed ToU tariffs related to real time carbon intensity on the grid. These tariffs would allow those consumers to charge EVs at a time when renewables are high and potentially discharge at a time to displace fossil fuel generation.

We want to understand if the green tariff framework can play a greater role in support of decarbonisation and providing flexibility to the electricity system. For example, if the REGO scheme was evolved to cover all forms of generation on a half hourly basis – could it help in any way to supporting a technological and regulatory framework for flexibility?

In section 1.2 we referenced emerging innovation in the ToU space – such as ‘plunge pricing’ related to wholesale energy rates. We want to continue to encourage the development of more innovative products to market – such as further initiatives related to carbon intensity, whereby consumers are encouraged to use energy at times when there is surplus of renewables (and so the carbon intensity of grid is low.)

**Q10: Should there be any avenues to accommodate flexibility technologies within a future green tariff framework (should a future framework be necessary)? If so, how could this be achieved?**

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<sup>44</sup> <https://www.ofgem.gov.uk/publications-and-updates/electricity-retail-market-wide-half-hourly-settlement-decision-and-full-business-case>

**Q11: Can you provide any evidence on areas where the current REGO system works well or creates barriers to the market offering more innovative ToU tariffs?**

**Q12: Are there any other emerging needs you believe a future green or low carbon tariff framework (should a future framework be necessary) should accommodate?**

## 3.2 Other low carbon solutions

The Energy White Paper presented a vision of how we make the transition to clean energy by 2050 and what this will mean for us as consumers of energy in our homes and places of work, or for how businesses use energy to produce goods and services. Our success will rest on a decisive shift away from fossil fuels to using clean energy for heat and industrial processes, as much as for electricity generation. We will reduce emissions through shifting from gas to electricity to heat our homes and by better insulating the buildings in which we live and work. We will end the sale of petrol and diesel cars and vans, and accelerate the transition to clean, zero tailpipe emission vehicles. We will start to capture carbon emissions from power generation and from industry. And we will switch to new, clean fuels such as hydrogen for heat, power and industrial processes as well as encourage the deployment of 'green gas' onto the system.

As our system continues the evolution from fossil fuels to low carbon power, we must consider how best a green tariff framework will accommodate carbon accounting for these technologies.

### Nuclear

Nuclear power continues to be an important source of reliable clean electricity, currently supplying around 16% of our needs<sup>45</sup>. It is an energy-dense technology which provides large volumes of power from very little land area and can reduce system costs at low levels of emissions.

### CCUS (including BECCS)

In the power sector, gas-fired generation with CCUS can provide flexible, low-carbon capacity to complement high levels of renewable generation. These characteristics mean that deployment of power CCUS projects, including those using biomass will play a key role in the decarbonisation of the electricity system at low cost. In the 'power' chapter of the Energy White Paper, we committed to the deployment of at least one power CCUS project to be operational by 2030, and put in place the commercial framework required to help stimulate the market to deliver a future pipeline of power CCUS projects.

### CHP

Combined heat and power (CHP) is an efficient cogeneration process able to use a wide variety of fuel sources, capturing and utilising the heat that is produced in power generation. By

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<sup>45</sup> BEIS (2020), [Energy Trends, table 5.1](#)

generating heat and power simultaneously from the same fuel, CHP can achieve efficiencies of up to 30% compared to the separate generation of heat through a gas-fired boiler and an electricity power station. Where demand for both heat and electricity exists in the same location, CHP can reduce energy costs whilst reducing carbon emissions and air pollution. CHP generators may export power not used on site, effectively acting as dispatchable generation CHP which can adjust its exported power output to provide valuable flexibility services to the electricity network.

In 2019, the Good Quality CHP capacity<sup>46</sup> in the UK was an estimated 6050 MWe generating 7.1% of all electricity generated in the UK, 5.7% of the total heat demand and 20.3% of industrial heat demand<sup>47</sup>. CHP has been identified as an important technology for achieving government's targets due to its potential role contributing to decarbonising heating and cooling, achieving industrial energy efficiency savings and the transition to low carbon fuels.

Good quality electricity generation certified by the Combined Heat and Power Quality Assurance (CHPQA) scheme meets high efficiency criteria and acts as a cogeneration guarantee of origin within the wider REGO framework.

## Hydrogen

Hydrogen can be used as a feedstock, fuel or an energy carrier and storage, and has many possible applications across industry, transport, power and buildings sectors. Significantly, the use of hydrogen emits no CO<sub>2</sub> if it is produced by electrolysis from renewable power. This means it can potentially offer a solution to decarbonise industrial processes and economic sectors where reducing carbon emissions is both urgent and hard to achieve.

Low carbon hydrogen could potentially provide a way to decarbonise our gas supplies on a much larger scale than reliance on biomethane alone. This could offer consumers a future heating option which works for them in a very similar way to natural gas today, but without carbon emissions.

The potential and versatility of hydrogen also increases the need to track primary energy sources all the way to applications, taking into account energy transformations along the way (power to hydrogen, hydrogen to methanol, etc.) for market participants to be able to make informed choices about the energy they purchase and consume.

BEIS has committed to publishing the UK Hydrogen Strategy in due course and is developing new policies to encourage the deployment of new low carbon hydrogen production, including the development of a 'UK Low Carbon Hydrogen Standard'<sup>48</sup>.

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<sup>46</sup> Good Quality CHP denotes schemes that have been certified as being highly efficient through the UK's CHP Quality Assurance (CHPQA) programme.

<sup>47</sup>

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/929571/2020\\_End\\_use\\_tables\\_-\\_web\\_copy.xlsx](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/929571/2020_End_use_tables_-_web_copy.xlsx)

<sup>48</sup> Insert consultation link here if published. If not, refer that it is upcoming.

**Q13: Should other forms of low carbon power, such as nuclear, hydrogen, CCUS and CHP be considered as part of any future green or low carbon tariff regulatory developments (should developments be necessary)?**

## Green Gas

Biomethane (or 'green gas') is a form of gas that is produced by processing biomass. It can be used for the same purposes as natural gas, like producing electricity or heat, and can use the same infrastructure for transmission and end-user equipment. Biomethane is currently the only green gas commercially produced in the UK. It can be injected into the gas grid to accelerate the decarbonisation of gas supplies.

In the 2019 Spring Statement, we committed to increase the proportion of biomethane in the gas grid. Earlier this year BEIS published a government response outlining the final policy positions for the Green Gas Support Scheme (GGSS), and the Green Gas Levy (GGL) on GB fossil fuel gas suppliers which will fund the scheme. The GGSS will launch in autumn 2021, and will support continued new deployment of anaerobic digestion biomethane plants in order to increase the proportion of green gas in the grid.

We note that, currently, gas tariffs are not within scope of the green tariff regulatory framework and that suppliers are beginning to market their gas offer as 'green'. We would like to request views and evidence as to whether we should include gas tariffs within the scope of our activity.

**Q14: There is an emerging market for 'green gas' tariffs. Should our work consider any interventions to include these within the tariff regulatory framework?**

## 4. Next steps

We will consider all responses and evidence gathered. We expect to publish a summary of responses and update on position in early 2022.

As referenced in “REGOs and EU Exit” section, GoOs issued in GB and NI are no longer recognised in the EU. The Government has committed to review this position so that, in the longer term, recognition in GB and NI of GoOs issued in EU member states will take place only on a reciprocal basis. Any changes to the use of REGO certificates or changes to the relevant legislation will be consulted on at the appropriate time.

## 5. Summary of questions

**Q1: Does the current approach of retrospective annualised matching (using REGO certificates) provide a sufficient level of consumer transparency? Please provide reasons.**

**Q2: Can you provide any evidence on your commercial experiences with PPAs for renewable energy? For example – availability, commercial competitiveness etc.**

**Q3: Can you provide any evidence on operational issues or other challenges that may materially limit a supplier's ability to offer PPA backed green electricity tariffs? For example, how do you balance forecasting of consumers usage vs the need to settle on a half hourly basis?**

**Q4: Can you provide any insights or evidence as to the role REGO certificates play in financing and commercial decision making?**

**Q5: How can green tariffs be regulated to enable consumer choice to drive additional investment in low carbon electricity generation? Please provide reasons.**

**Q6: Should the ability to report emissions using both market-based and location-based emission factors be maintained, and if so, should there be a requirement to report both side by side in corporate reporting?**

**Q7: Can you provide any evidence regarding the types of messages associated with green electricity tariffs that you believe to be misleading to consumers?**

**Q8: Can you provide any evidence as to the type of interventions or remedies (including international best practice approaches) which may help achieve greater transparency in green electricity tariffs?**

**Q9: How best do you think the carbon content of energy supplied to a home or business consumer could be made more transparent to consumers?**

**Q10: Should there be any avenues to accommodate flexibility technologies within a future green tariff framework (should a future framework be necessary)? If so, how could this be achieved?**

**Q11: Can you provide any evidence on areas where the current REGO system works well or creates barriers to the market offering more innovative ToU tariffs?**

**Q12: Are there any other emerging needs you believe a future green or low carbon tariff framework (should a future framework be necessary) should accommodate?**

**Q13: Should other forms of low carbon power, such as nuclear, hydrogen, CCUS and CHP be considered as part of any future green or low carbon tariff regulatory developments (should developments be necessary)?**

**Q14: There is an emerging market for 'green gas' tariffs. Should our work consider any interventions to include these within the tariff regulatory framework?**

## 6. Glossary of terms

BECCS – Bioenergy Carbon Capture and Storage is a form of carbon capture and storage in which biomass is used as the fuel. Biomass is converted into bioenergy and the carbon emissions from this bioenergy conversion are captured and stored. As biomass draws carbon dioxide from the atmosphere as it grows, BECCS can be a negative emissions technology.

BEIS – The Department for Business, Energy and Industrial Strategy

CCUS – Carbon capture, utilisation and storage is a system that captures the carbon dioxide generated by large-scale energy intensive processes (e.g. cement and steel production, chemical processing, hydrogen production and power generation), preventing it from entering the atmosphere and contributing to climate change.

CfD – Contracts for Difference

CHP – Combined Heat and Power is a process that captures and utilises the heat that is a by-product of the electricity generation process.

CMA – Competition and Markets Authority

EAC – An Energy Attribute Certificate verifies one megawatt-hour of renewable electricity consumption.

ESO – The Electricity System Operator is responsible for moving electricity around the system to keep homes and business supplied with the energy they require, balancing supply and demand.

FIT – Feed in Tariff

FMD – Fuel Mix Disclosure is a requirement on electricity suppliers in Great Britain to disclose the mix of fuels used to generate the electricity supplied annually. It was introduced under the Electricity (Fuel Mix Disclosure) Regulations 2005 (SI 2005 No. 391).

GB – Great Britain

GHG Protocol – Greenhouse Gas Protocol, which launched in 2001, is a global standardized framework to measure and manage greenhouse gas (GHG) emissions from private and public sector operations, value chains and mitigation actions.

GoO – Guarantees of Origin are electronic documents which label renewable electricity generated per megawatt-hour to provide information to electricity customers on the source of their energy. GoOs are also issued to high efficiency cogeneration.

kgCO<sub>2</sub>e – Kilograms of carbon dioxide equivalent

LEC – Levy Exemption Certificate is an electronic certificate issued by Ofgem to be used by a licensed electricity supplier as evidence of its supply of electricity from a renewable source. LECs were used to claim an exemption from the climate change levy (CCL) but are no longer used.

MWh – megawatt-hour

National Grid plc is a publicly listed utility company focused on the transmission and distribution of electricity and gas, whose principal activities are in the Great Britain and in the United States. Within the National Grid plc group, National Grid ESO is the electricity system operator for Great Britain.

NFFO – Non-Fossil Fuel Obligation

NI – Northern Ireland

Ofgem – The Office of Gas and Electricity Markets

PPA – A Power Purchase Agreement is a contract which defines the commercial terms for the sale of electricity between the buyer and seller, including details such as when the project will begin commercial operation, schedule for delivery of electricity, penalties for under delivery, payment terms, and termination.

REGO certificate – A Renewable Energy Guarantee of Origin certificate is a certificate issued per megawatt-hour (MWh) of eligible renewable output to generators of renewable electricity located in Great Britain and Northern Ireland. REGO certificates are the UK equivalent of EU GoOs.

RO – Renewables Obligation

SEG – Smart Export Guarantee

SLC – Standard Licence Conditions are conditions that apply to all licensees of a particular licence type. The conditions place rules on how holders can operate within their licence. EWP – Energy White Paper (2020)

ToU – Time of Use is a time-based billing structure in which the unit rate for the electricity consumed varies depending on the time of day.

UK – United Kingdom

## 7. Annexes

### Annex 1: Government Policy Mechanisms Used in Support of Eligible Renewable Generation Technologies.

Renewables' deployment in the UK has accelerated over the past two decades due to the success of several support mechanisms.

The NFFO was introduced in 1990 as the government's first primary instrument of renewable energy policy. It was established under powers in the Electricity Act 1989 which privatised electricity generation in the GB. The NFFO legislation subsidised nuclear and renewable electricity by requiring the former public electricity suppliers (PES) to purchase specified amounts of electricity directly from non-fossil sources of generation. The NFFO scheme is no longer open to new generators and the last contracts expired in 2019.

The RO was then introduced by the then Department of Trade and Industry (DTI) and came into effect in England, Wales and Scotland in 2002 to support large-scale renewable electricity projects in GB and was later introduced in Northern Ireland by the then Department of Enterprise, Trade and Investment in 2005<sup>49</sup> to do the same in NI.

In GB, the RO places an annual obligation on electricity suppliers in the relevant jurisdiction to source a certain percentage of the electricity they supply from renewable sources. To evidence this they obtain and present green certificates, known as "ROCs" (Renewables Obligation Certificates), to the RO administrator Ofgem. Ofgem issue ROCs to accredited generators for the net renewable electricity generated each month. ROCs are then sold directly or indirectly to suppliers who redeem them against their Renewables Obligation, which is proportional to the amount of renewable electricity they have supplied over the course of each obligation year. Although the scheme closed to all new generation capacity on 31 March 2017, the RO will continue to support renewable electricity generation until 2037.

The FiT scheme was introduced by the then Department for Energy and Climate Change (DECC) on 1 April 2010<sup>50</sup> under powers in the Energy Act 2008. The scheme created a subsidy framework for small-scale low carbon technologies, making payments on at least a quarterly basis for the electricity generated and exported by a given generator. It was available for any GB installations of solar, wind, hydro, and anaerobic digestion technology of up to 5MW capacity or 2kW for micro combined heat and power (CHP) installations, though the number of new installations eligible for support was capped. The scheme stopped accepting new applications after 31 March 2019.

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<sup>49</sup> <https://www.ofgem.gov.uk/environmental-programmes/ro/about-ro>

<sup>50</sup> <https://www.ofgem.gov.uk/environmental-programmes/fit/about-fit-scheme>

FiT was superseded by the Smart Export Guarantee (SEG) on 1 January 2020<sup>51</sup>, a scheme designed by BEIS to ensure that small-scale low-carbon generators located in GB have a route to market for any electricity they export to the grid following the closure of the FiT scheme. SEG places a requirement on licensed electricity suppliers to offer a payment to eligible small-scale, low carbon generators for the electricity that they export to the National Grid. The scheme is open to electricity generators located in GB for solar, onshore wind, hydro, and anaerobic digestion capacity of up to 5MW capacity, or up to 50kW capacity for micro combined heat and power (micro-CHP).

Meanwhile, the CfD scheme was introduced by DECC in 2013<sup>52</sup> to incentivise investment in new low carbon electricity generation. A contract for difference (or CfD) is a private law contract between a renewables electricity generator located in the UK and the government-owned Low Carbon Contracts Company (LCCC). The contract enables the generator to stabilise its revenues over a 15-year period at a rate equal to the difference between a “strike price”, which reflects a price for electricity accounting for the cost of investing in a particular low carbon technology, and a “reference price”, which represents a measure of the average market price for electricity in the GB market. This offers price certainty to electricity generators and reduces their exposure to volatile wholesale prices.

## Annex 2: REGO Applications

As a method of accounting for renewable electricity generation, REGO certificates underpin a variety of applications, these are:

### **FMD – Supply Licence Condition 21**

As part of their annual FMD reporting, GB suppliers ‘claim’ relevant REGO certificates as their own on the Ofgem-administered register to calculate the renewable portion of their annual fuel mix (by accounting for the proportion procured from renewable sources).

### **GB Domestic Green Electricity Tariffs – Supply Licence Condition 21D**

Suppliers use REGO certificates to ‘match’ the volume of energy supplied to their customers’ premises with energy generated from renewable sources.

### **Carbon Accounting & Reporting – Greenhouse Gas Protocol Scope 2 Reporting**

REGO certificates also play a role in carbon emissions accounting, for example in mandatory reporting by large and quoted UK businesses in their Annual Reports under the Streamlined Energy and Carbon Reporting framework or where companies have committed to be 100% renewable<sup>53</sup>.

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<sup>51</sup> <https://www.ofgem.gov.uk/environmental-programmes/smart-export-guarantee-seg/about-smart-export-guarantee-seg>

<sup>52</sup> <https://www.gov.uk/government/publications/contracts-for-difference/contract-for-difference>

<sup>53</sup> <https://www.there100.org/re100-members>

The Greenhouse Gas (GHG) Protocol<sup>54</sup> provides one of the key international frameworks for carbon accounting, although there are a range of other reporting frameworks. The GHG protocol is one of the most common methodologies used by businesses and public sector when reporting on their emissions in annual reports, and classifies emissions under specific scopes. Scope 1 covers direct emissions from owned or controlled sources, Scope 2 covers indirect emissions from the generation of purchased energy, steam, heating and cooling consumed by the reporting organisation, and Scope 3 includes all other indirect emissions that occur in an organisation's value chain.

REGO certificates are used as part of the evidence of emissions and performance against any carbon reduction targets. The GHG Protocol classifies as "Scope 2 emissions" the emissions associated with purchased energy generated by another entity and supplied to the customer (typically, grid-delivered electricity). Under the GHG Protocol, Scope 2 emissions can be reported by organisations using location-based or market-based emission factors, with the GHG guidance recommending both factors are reported ("dual reporting"). The market-based method is based on GHG emissions emitted by the generators from which the reporter contractually purchases electricity bundled with contractual instruments, or contractual instruments on their own. The location-based method quantifies Scope 2 emissions based on grid average energy generation emission factors for defined geographic locations, including local, subnational, or national boundaries. The factors can give quite different results, so it is important that corporate reports are transparent on which factors have been used.

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<sup>54</sup> <https://ghgprotocol.org/>

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This consultation is available from: <https://www.gov.uk/government/consultations/designing-a-framework-for-transparency-of-carbon-content-in-energy-products-call-for-evidence>

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