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1 Implementation of Tracking Systems

1.1 Electricity Disclosure

A disclosure scheme has been in place in Great Britain since 2005 [Statutory Instruments 2005 N°. 391 Electricity and Gas (Fuel Mix Disclosure) Regulations 2005 and Standard Licence Condition 21¹]. The Regulations implemented Article 3(6) of Directive 2003/54/EC related to the common rules for the Internal Market of Electricity and introduced a new licence condition that obliges electricity suppliers to provide costumers on their bill with details of the mix of fuels used to produce the electricity supplied to them as well as certain environmental information.

In December 2005, Ofgem (Office of the Gas and Electricity Markets) provided the guidelines (Fuel Mix Disclosure by Electricity Suppliers in Great Britain – Guidelines²) to help suppliers to present the disclosure information to their consumers, with standardisation of certain aspects of fuel mix disclosure (originally the Standard Licence Condition 30A that has been replaced now by the Standard Licence Condition 21) to aid consumer's comparisons of different suppliers product. These Guidelines provide information on the calculation, presentation, evidence and auditing. In 2010, small changes to the disclosure system have been introduced, namely, timing for suppliers to provide information on their sources for the production of electricity as well as timeline for disclosure (1st October).

The first year in which information was disclosed to consumers was from 1st October 2005 to 30 September 2006, referring to electricity supplied from 1st April 2004 to 31st March 2005.

Ofgem, on behalf of DECC (Department of Energy and Climate Change), is the competent body responsible for disclosure and the issue of Guarantees of Origin for electricity produced from renewable energy sources.

The attributes that have been disclosed are:

- Energy source in the fuel mix (share);
- Environmental information: CO₂ emissions (g/kWh) and radioactive waste (g/kWh);

In terms of energy sources, the following are distinguished within the disclosure statement:

- Coal;
- Natural Gas (gas-CHP);
- Nuclear;
- Renewable (wind, solar, geothermal, wave, tidal, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases);
- Other
- Electricity obtained via an Electricity Exchange of imported from an undertaking outside the Community

Great Britain has various forms of allocation and tracking systems for electricity:

¹ Statutory Instruments 2005 No.391 Electricity and Gas The Electricity (Fuel Mix Disclosure) Regulations 2005 <http://www.berr.gov.uk/files/file21794.pdf>. And Standard Licence Condition 21, available here: <https://epr.ofgem.gov.uk/Document>

² Ofgem Website, Fuel Mix Disclosure by Electricity Suppliers in Great Britain Guidelines - Dec 05 - Ofgem (http://www.ofgem.gov.uk/Sustainability/Environment/Policy/Documents1/12340-282_05.pdf). 2010 Letter: <https://www.ofgem.gov.uk/ofgem-publications/57767/fuel-mix-disclosure-letter.pdf>



- Renewable Energy Guarantees of Origin (RE-GO, called in Great Britain REGO): used for disclosure purposes
- Renewable Obligation Certificates (ROC): used for support (quota and suppliers) system
- Feed-in-tariff: used for support
- Levy Exemption Certificates (RE & CHP): used for support
- CHP- Guarantees of Origin (CHP-GO, called in Great Britain CHPGO): used for disclosure purposes (in theory)
- Great Britain Residual mix: used for disclosure purposes

The environmental information provided to consumers should be in the form of a single figure specific to the fuel mix of the supplier for each of the two measures (carbon dioxide and radioactive waste).

The obligation to provide fuel mix and environmental information is placed on each supply licensee. Therefore, customers subscribing to a certain product must receive information on the fuel mix of all electricity supplied by the licensee (the person that holds the supply licence) as opposed to the particular product or retail brand. The name of the licensee should be made clear in the information.

If suppliers wish to provide information on the fuel mix of a particular product, they can do so by displaying the total supply by the licence plus by adding a column in its fuel mix disclosure table to display the product fuel mix. This allows the consumer to compare the fuel mix of a certain product with that of licensee's total supply for the disclosure period.

Disclosure is done annually for the financial year period (starting 1st April and ending 31st March each year). Information must be disclosed in the 1st October immediately after the end of the disclosure period.

1.1.1 Disclosure Figures

Table 1 summarises Great Britain's fuel mix disclosure figures since 2005 until 2013 as well as the CO₂ emissions and nuclear waste. Table 2 shows the suppliers' fuel mix by fuel type in 2013 as well as the CO₂ emissions and nuclear waste for the same year.

Table 1: GB Fuel Mix Disclosure Figures (%), CO₂ emissions 2008-2013 (kgCO₂/kWh) and nuclear waste (g/kWh) for 2005-2013 (with the exception of 2010)

Attributes	2005	2006	2007	2008	2009	2011	2012	2013
Coal (%)	33.4	35.2	35.8	33.0	32.9	28.9	38.4	38.4
Natural Gas (%)	39.3	36.8	38.8	43.5	43.3	44.2	27.7	27.7
Nuclear (%)	20.6	20.9	18.6	16.1	15.3	17.3	20.6	20.6
Renewable (%)	3.8	4.2	4.7	5.5	5.9	7.9	11.3	11.3
Other (%)	2.9	2.9	2.1	1.9	2.5	1.7	2.0	2.0
CO₂ emissions (kgCO₂/kWh)	0.460	0.461	0.480	0.480	0.460	0.450	0.470	0.470
Nuclear Waste (g/kWh)	0.0025	0.0025	0.021	0.014	0.015	0.0017	0.009	0.009

Source: www.electricityinfo.org

Table 2: Fuel Mix Disclosure Figures of Great Britain Electricity Suppliers for the disclosure year of 2013

Fuel Mix Disclosure Data: 2013								
supplier	coal	gas	nuclear	renewable	other	CO ₂	nuclear waste*	disc. year
British Gas	26.0	34.0	28.0	10.0	2.0	0.379	0.00260	2013
Co-operative Energy	0.0	40.4	0.0	54.3	5.3	0.177	0.00000	2013
e.on	52.2	30.7	4.7	8.4	4.0	0.619	0.00040	2013
Ecotricity	18.5	10.9	1.7	67.5	1.4	0.219	0.00014	2013
EDF Energy	17.0	0.0	73.7	8.3	1.0	0.161	0.00660	2013
First:Utility	52.3	30.7	4.7	8.3	4.0	0.619	0.00040	2013
Good Energy	0.0	0.0	0.0	100.0	0.0	0.000	0.00000	2013
Green Energy UK	0.0	79.0	0.0	21.0	0.0	0.190	0.00000	2013
LoCO2 Energy	0.0	54.0	0.0	46.0	0.0	0.213	0.00000	2013
npower/RWE	33.6	51.0	0.4	14.0	1.0	0.512	0.00004	2013
OVO Energy	43.4	25.5	3.9	23.9	3.3	0.514	0.00040	2013
ScottishPower	59.0	25.6	1.3	12.9	1.2	0.640	0.00010	2013
Spark Energy	52.3	30.7	4.7	8.3	4.0	0.619	0.00040	2013
SSE	54.0	28.0	1.0	15.0	2.0	0.613	0.00011	2013
UK Average	38.4	27.7	20.6	11.3	2.0	0.470	0.00190	2013

Note:

- CO₂ emissions are in kg/kWh; nuclear waste relates to high-level waste in g/kWh.
- British Gas (includes Centrica and Scottish Gas)
- EDF Energy (includes London Energy, Seeboard and SWEB Energy)
- e.on (includes Amerada, East Midlands Electricity, Eastern Electricity, Midlands Gas, Norweb Energy, Powergen, Sterling Gas, Tesco Energy and TXU Energi)
- npower/RWE (includes Calortex, Daily Telegraph, Independent Energy, MEB, Midlands Electricity, National Power, Npower Limited, Npower Northern Limited, Npower Yorkshire Limited, Npower Direct Limited and York Gas)
- SSE (Scottish & Southern Energy) (includes Atlantic Electric and Gas, Scottish Hydro-Electric, Southern Electric, and SWALEC)
- ScottishPower (includes AA, Beacon, Ideal and Lloyds Ideal)

Source: www.electricityinfo.org

1.1.2 Environmental Information

Environmental information in terms of CO₂ emissions (in grams of carbon dioxide per kilowatt hour) and radioactive waste generated (in grams per kilowatt hour) must be prepared and made available by suppliers in the disclosure period.

This information should be in the form of a single figure specific to the fuel mix of the supplier for each of the environmental attributes (carbon dioxide emissions and radioactive waste). The calculation of these figures should be based on the use of the standardised emission factors provided by UK's Department of Energy and Climate Change (DECC) in the Fuel Mix Disclosure Table published on the DECC's website³. The basis for the calculation of the radioactive waste factor is to be "fuel burnt in the reactor (to be subsequently discharged as spent fuel)". This is to be based on information provided by generators an averaged across all technologies.

³ Fuel Mix Disclosure Table on the DECC's Website:

http://www.decc.gov.uk/en/content/cms/statistics/energy_stats/fuel_mix/fuel_mix.aspx

This information is updated by suppliers in each subsequent year on the “Disclosure Date” and provided to the consumers at least once a year on a bill or statement in the period and in promotional materials. This may be by means of a reference on the bill, statement or promotional material to a readily accessible source such as a web page.

Moreover, if suppliers want to, they can provide a wider range of environmental information, e.g. emissions of sulphur dioxide or other pollutant.

1.1.3 Suppliers Fuel-Mix Calculations

DECC is the body responsible for calculating the fuel mix figures and to disclose them once a year.

The supplier’s fuel-mix information for a given Disclosure Period (starting in the 1st of April and ending on the 31st of March of a given year) is calculated based on the following evidence of the source of energy:

1. RE-GO (called in the UK REGO) should be used as evidence for the identification of supply as renewable. However if they are not available the residual fuel mix percentages in the DECC’s Fuel Mix Disclosure Data Table must be used to make the necessary calculations;
2. Generators declarations should be used as evidence for the identification of other sources, i.e. coal, oil, natural gas, nuclear and other. In the case that these are not available, the residual fuel mix percentages in the DECC’s Fuel Mix Disclosure Data Table must be used to make the necessary calculations

The evidence of supply from specific generation sources, RE-GO or generator declarations, should be held by the supplier at midday on 1st July immediately following the end of the disclosure period.

A generators declaration should include the following specific information⁴:

- The name and location of the generating station;
- The name of the licence to which the information in the generator declaration relates;
- The disclosure period to which the generator declaration relates;
- The fuel used in the generating station, and where the generating station uses more than one fuel the proportion of each fuel used according to the calorific value of the fuel used;
- The amount of electricity subject to the declaration, expressed in MWh;
- A statement that the generator has not issued generator declarations or transferred RE-GO in relation to an amount of electricity that exceeds the total output of the generating station in the disclosure period;
- The signature of the director of the generation company or person of similar standing where the generation licensee is not a company to verify the above facts.

The generators declarations must be held by the suppliers for electricity produced from coal, natural gas, nuclear and other and supplied in each disclosure period.

When the electricity supplied came from outside Great Britain, suppliers must provide evidence of the origin of that electricity:

- Generators declaration from a generator outside Great Britain – evidence must be held by the supplier showing that the electricity referred in the generators declaration was supplied in Great Britain. In this case, this generator declaration must not be used as evidence of fuel mix in a country outside Great Britain.
- RE-GO from other Member Countries – in addition to the RE-GOs suppliers must hold evidence that the electricity referred to in the RE-GO was supplied in Great Britain. The RE-GO used in this case must not be used as evidence of fuel mix by a supplier in another Member State.
- Figures from an electricity exchange or an undertaking outside the Community – suppliers may use this figures if the figures clearly identify the production from a particular energy source.

⁴ Guidelines for fuel mix disclosure by suppliers in Great Britain, December 2005, extracted at: http://www.ofgem.gov.uk/Sustainability/Environment/Policy/Documents/1/12340-282_05.pdf

If a supplier of electricity does not hold evidence (generator declarations, a RE-GO or figures on an electricity exchange) to use as evidence of the energy sources for the purpose of fuel mix disclosure, it should apportion the amount of electricity for which evidence is not held in accordance with the residual fuel mix percentages in the DECC's Fuel Mix Disclosure Data Table.

The competent body that compiles and updated the Fuel Mix Disclosure Data Table is DECC. DECC is also responsible for publishing on its website this table by the 1st of August each year. This Fuel Mix Disclosure Data Table includes:

- table for residual fuel mix – which is compiled by DECC using the best available information on the actual mix of electricity not subject to generators declarations or RE-GOs after consulting with major suppliers;
- emission rates to be used in calculating environmental impact of total electricity supplied by the licensee – including carbon emission rates for each energy source and the amount of radioactive waste for nuclear generation
- losses factor – this factor is to be used to adjust the total amount of electricity purchased for supply to be used in calculations by the licensee, accounting in this way for losses on the transmission and distribution systems.

Residual fuel mix calculation methodology

For the calculation of the residual fuel mix for GB the following steps are taken⁵:

- DECC request all major suppliers the following information regarding the supply for which RE-GOs or Generators Declarations held:
 - Coal (MWh)
 - Natural Gas (MWh)
 - Nuclear (MWh)
 - Renewable (MWh)
 - Other (MWh)
 - Total for which RE-GOs or Generator Declarations are held (MWh)
 - Residual (supply for which RE-GOs or Generator Declarations are not Held (MWh)
 - Total supplied (MWh)
- DECC then aggregates the data to give the total amount of electricity supplied by fuel source for which RE-GOs of Generator Declarations are held:
 - The total purchased for supply (incl. loss factor) (MWh) is calculated by DECC for each major energy supplier and aggregated as a total for all major energy suppliers:

$$\left(\begin{array}{l} \text{Total non-renewable supplied} \\ \text{for which RE-GOs or} \\ \text{Generator Declarations held} \end{array} \right) \times \begin{array}{l} \text{Loss} \\ \text{Factor} \end{array} + \begin{array}{l} \text{Total supplied by renewables} \\ \text{for which RE-GOs of} \\ \text{Generators Declarations held} \end{array}$$

- The total UK fuel mix is calculated on a financial year basis using DECC's published statistics. Data for the UK is published on table 5.1 on DECC's quarterly publication: Energy Trends⁶

⁵ DECC's UK Fuel Mix Methodology, extracted from:
<http://www.decc.gov.uk/assets/decc/11/stats/energy/fuel-mix-disclosure/2354-uk-fuel-mix-methodology-2011.pdf>

⁶ DECC's Energy Trends available at:
http://www.decc.gov.uk/en/content/cms/statistics/energy_stats/source/electricity/electricity.aspx

- The UK data is then converted by DECC to cover Great Britain only by deducting data from Northern Ireland (Northern Ireland Fuel Mix data from monthly returns sent in by electricity companies based in Northern Ireland)
- Imported electricity is also allocated to a fuel type using fuel mix data for France which is available from Eurostat;
- The data are expressed as a percentage of total supply in Great Britain. Each percentage is multiplied by the “*Total purchased for supply (incl. loss factor) (MWh)*” to give the total electricity supplied for each fuel source. The difference between this and the actual figures reported by the major electricity suppliers gives GB residual fuel mix, which is then expressed in percentage terms.

Carbon dioxide emissions

The methodology followed by DECC for the calculation of the carbon dioxide emissions is the following⁷:

- The carbon dioxide emissions by fuel type are obtained by DECC from the UK greenhouse gas inventory. The total emissions for generation by fuel are then divided by the electricity supplied for each fuel type to give the CO₂ emissions per kWh.
- The emissions are rounded up to the nearest 10 to reflect the uncertainty around the data. Emission data are generally available 12 months in arrears (and on a calendar year basis) so are adjusted to take into account changes in electricity supply over the last year. Data is also adjusted to convert emission from the UK to GB.

1.1.4 Acceptance of GOs

In terms recognising RE-GOs from Ofgem may refuse to recognise a GO issued by another Member State where there are doubts about the accuracy, reliability or veracity accordingly to the supra-referred Regulations. Suppliers can transfer GOs from other countries but may only use a GO issued outside Great Britain (or on a generator declaration for non renewable energy) for fuel mix disclosure purposes if it holds evidence that the electricity referred to in the GO has been supplied in Great Britain and that it has not been used outside of Great Britain as evidence of fuel mix.

Thus in GB GO are recognised from other EU Member States outside of EECs and outside of its Renewables and CHP Register. Guidance on the recognition process adopted in GB is provided on Chapter 7 of the “Renewable Energy Guarantees of Origin Guidance for generators, agents and suppliers⁸”. Ofgem publishes all recognised GO on the Ofgem website, www.ofgem.gov.uk.

1.2 Guarantees of Origin for Electricity from Renewable Energy Sources and High-Efficient Cogeneration

Great Britain as both RE-GO and CHP-GO legislation and schemes in place.

RE-GO scheme came into force in Great Britain in October 2003 through The Electricity (Guarantees of Origin of Electricity Produced from Renewable Energy S.I. 2003/2562) Regulations 2003. This legislation has been amended by The Electricity (Guarantees of Origin of Electricity Produced from Renewable Energy S.I. 2010/2715) Regulations 2010. Both Regulation 2003 and Regulations 2010 implement Article 15 of the Directive 2009/28/EC of the European Parliament and the Council of 23 April 2009 on the promotion of the use of energy from renewable sources

CHP-GOs scheme came into force in February 2007 through the Guarantees of Origin of Electricity Produced from High-efficiency Cogeneration 2007 (S.I.2007/292). These regulations implement Article 5

⁷ DECC’s UK Fuel Mix Methodology, extracted from:
<http://www.decc.gov.uk/assets/decc/11/stats/energy/fuel-mix-disclosure/2354-uk-fuel-mix-methodology-2011.pdf>

⁸ Ofgem Website, Renewable Energy Guarantees of Origin Guidance for generators, agents and suppliers Document, <https://www.ofgem.gov.uk/publications-and-updates/renewable-energy-guarantees-origin-guidance-generators-agents-and-suppliers>

(article for the issuance of guarantees of origin of electricity from high-efficiency cogeneration) of Directive 2004/8/EC of the European Parliament and of the Council on the promotion of cogeneration based on a useful heat demand in the internal energy market.

Renewable electricity produced in Great Britain can receive both RE-GO (in electronic form) and CHP-GO (paper form).

1.2.1 RES-GO System

As referred, The Electricity Regulations 2003 (S.I. 2003/2562) with the amendments from Regulations 2010 (S.I 2010/2715) transpose article 15 of the Renewables Directive, in reference to RE-GOs. These regulations appoint Ofgem (Gas and Electricity Markets Authority) as the competent body to issue, register, transfer, revoke and cancel GOs for electricity from renewable energy sources.

Under this scheme a RE-GO:

- Is issued by Ofgem to certify that the electricity in respect to which it was issued was produced from eligible renewable energy sources;
- Is as an electronic document which has the sole function of providing proof to a final customer/potential customer that a given share or quantity of energy was produced from renewable sources;
- Is issued to accredited generating stations located in Great Britain and Northern Ireland;
- Is issued in response to a request from a producer of electricity from renewable energy sources;
- Is issued for each megawatt hour (MWh) of eligible renewable output generated⁹;
- Has a unique number (the “guarantee sequence number”) which is allocated to each RE-GO sequentially in ascending numerical order;
- Has a 16-month lifetime.

Schedule I of Regulation 2010 state the Information to be provided in a request for a RE-GO.

The primary use of RE-GOs in Great Britain is for Fuel Mix Disclosure. As already referred above, Fuel Mix Disclosure requires licensed electricity suppliers to disclose to their consumers and potential customers, the mix of fuels (coal, gas, nuclear, renewable and other) used to generate electricity supplied annually.

Ofgem is responsible for establishing and maintaining the electronic register and is responsible for publishing that information on its website or by such means as it considers appropriate. Schedule 2 of Regulation 2010 describes the information contained on the electronic register.

Moreover the Regulations state that Ofgem:

- Shall revoke a RE-GO where:
 - It is satisfied that the information provided for the issuing of the RE-GO is incorrect or that the RE-GO was issued on the basis of any fraudulent behaviour, statement or undertaking;
 - It is satisfied that the RE-GO should not have been issued (it inaccurate or was issued to the wrong person)
- Shall cancel a RE-GO where:
 - A RE-GO is issued in respect of electricity generated during a period of one month, the RE-GO should be cancelled not more than 16 months after the end of that month; or
 - when a GO is issued for more than one month, the RE-GO shall be cancelled not more than 16 months after the end of the first month which the electricity to which it related was generated;

⁹ This was one of the changes made by Regulations 2010 to Regulations 2003, and it was with effect from 5th December 2010. Prior to 5th December 2010 one RE-GO was issued for each kilowatt hour (kWh) of eligible renewable output generated.

RE-GOs cancelled or revoked shall no longer qualify as proof that the electricity for which it relates was produced from renewable energy sources.

1.2.2 CHP-GO System

The CHP-GO (called CHPGO in Great Britain) scheme came into force in February 2007 through the Guarantees of Origin of Electricity Produced from High-efficiency Cogeneration 2007 (S.I.2007/292). Within this scheme the Secretary of State for Environment, Food and Rural Affairs (DEFRA) is the designated competent body. DEFRA nominated CHPQA Administrator (AEA Technology) as the body for the assessment of high efficient CHP electricity generation for the purposes of Guarantees of Origin.

Under this scheme the one CHP-GO is issued for each unit (MWh) of electricity produced that qualify as high efficient CHP and it is only used for disclosure to increase transparency and aid consumer choice between CHP electricity and that produced by other technique. At the moment there is no electronic register for CHP-GOs and these GOs are planned to be paper issued. The Regulatory Impact Assessment (RIA) concluded that using a physical certificate, where it is the responsibility of the producer to store and transfer the certificate as necessary, was the most appropriate option for the UK. There is a risk that an appropriate authority cannot adequately track the CHP-GO certificate, however while the certificate has little monetary value in the UK, RIA believes this risk would be small. The scheme, by being linked to the CHPQA assessment programme, will match the safeguards of fraud-resistance, accuracy and reliability that are provided by the Commission model. Thus the UK does not plan to adopt the model developed by the Commission and the European Association of Issuing Bodies at this time. However the CHP-GO scheme will be similar enough to allow a transition to this model (i.e. an electronic registration system) if required and the situation will be kept under review.

The CHP-GO has a minimum lifetime of 3 months and maximum lifetime of 12 months.

The issuance of CHP-GOs is linked with the existing CHPQA assessment system. The assessment process involves:

- (i) determining the quantity of CHP electricity, heat and energy inputs (fuel) in accordance with Annex II of the EU Cogeneration Directive; and
- (ii) the calculation of Primary Energy Savings (PES) to determine the quantity of high efficiency CDP electricity in accordance with Annex III of the EU Cogeneration Directive.

An operator that wants to require a CHP-GO needs to apply to the CHPQA Administrator, as the nominated body for assessing the application. For that it should follow the guidance notes for CHP-GO and the applications guidelines¹⁰.

In Great Britain the CHP GO includes information on:

- Lower CV of fuel source for electricity;
- Use of heat and electricity generated
- Dates and places of production
- Quantity of electricity from high efficient CHP
- Primary Energy Savings (PES) based on harmonised efficiency reference values.

Schedule 1 of the Statutory Instrument 2007 n.292 Energy Conservation specifies the information that a producer needs to supply when requesting for a CHP-GO and Schedule 2 of the same instrument the full information contained in a CHP-GO.

For applying to a CHP-GO, the producer shall fill out and sign the application entitled Form CHPGO – Provision of Data for the Assessment of High Efficiency CHP Power Generation for the purpose of Guarantee of Origin. Upon the reception of this information, the CHPQA Administrator calculates the information required to issue the CHP-GO using as referred above Annexes II and III methodology required by the Cogeneration Directive. As the data provided to the CHPQA will be the basis for the calculating the information on the CHP-GO, this information should be demonstrably accurate and reliable.

¹⁰ DECC Website, Application Guidelines for CHP-GOs extracted at:
<http://chpqa.decc.gov.uk/assets/go/ApplicationGuidelines.pdf>

At the moment the CHP-GO does not carry any monetary value and so it is not envisioned that any system to fine producers that attempt to abuse the system is required. However, in case those CHP-GOs were obtained on the basis of incorrect information, they can be revoked.

The Government charges the request for CHP-GO, which is not mandatory and does not imply public support. This charge aims at recovering costs and depends on the complexity of the scheme: it charges significantly less to small CHP producers than to large complex CHP producers.

Where a CHP-GO has been requested, there may be additional costs to the producer associated with the installation of additional metering (fuel, electricity and heat), as the definition in the Directive of CHP electricity to be applied in the Guarantee of Origin, unlike the UK's CHPQA standard, does not allow heat produced by supplementary firing or in auxiliary boilers or electricity produced by a condensing turbine to be counted (and thus additional metering may be required). However, the issuance of a CHP-GO is at the request of the producer and any additional costs will form part of the commercial decision to request for this certificate.

Within this scheme CHP-GO can be:

- Replaced: through a request from the CHP-GO holder to the competent body if the holder believes that the CHP-GO is inaccurate);
- Transferred: when the CHP-GO holder does not operate the plant to which the CHP-GO has been issued for); and/or
- Revoked: if the competent body decided that (i) the CHP-GO is inaccurate; or (ii) it is satisfied that the information provided on the CHP-GO request is not accurate; or (iii) it is otherwise satisfied that the CHP-GO should not have been issued).

The Statutory Instrument 2007 Cogeneration also makes provisions for the recognition of CHP-GOs:

- CHP-GOs issued by the competent body shall be recognised by public authorities (any Minister, Government Department, public body or any description or any person holding public office) as a proof of electricity produced from high-efficiency CHP;
- CHP-GOs issued outside Great Britain shall be recognised provided that it has not been requested to refuse or withdraw such recognition by the authority that has issued or supervised the issue of the CHP-GO and that there are no doubts about the accuracy, reliability or veracity accordingly to the supra-referred Regulations.

Up until this moment no CHP-GOs have been issued in Great Britain.

1.2.3 GO Statistics

The following table shows the GOs statistics 2009-2013. The statistics are taken from the Ofgem Renewables and CHP Register and information provided for the RM calculation of 2013 disclosure period.

Table 3: GOs statistics 2009-2013

Year	Issued	Cancelled (Redeemed + Retired)	Revoked	Held
2009	23,445,002	40,360	97,471	23,307,171
2010	16,730,189	5,009,923	161,020	11,559,245
2011	23,410,586	6,952,046	-	16,458,540
2012	21,986,102	9,041,012	593,635	-
2013	47,051,240	9,332,523	144,313	37,574,404

1.3 RES-E Support Schemes

Renewables Obligation

The Renewables Obligation (RO), introduced in 2002 is UK's main financial mechanism by which the Government encourages the deployment of large-scale renewable electricity generation. This mechanism provided support for 20 years, which balances the need to provide investors with long-term certainty with the need to keep costs to consumers to a minimum, and requires licensed electricity suppliers in the UK to source a specific and annually increasing percentage of their sales from eligible renewable sources or they pay a penalty. Since it was introduced it has been very successful in supporting the deployment of renewables generation from 3.1GW in 2002 to 8GW in 2009 and more than tripling the level of renewable electricity in the UK from 1.8% in 2002 to 6.6% in 2010. It is currently worth around £1.3 billion a year in support to the renewable electricity industry¹¹.

This scheme was introduced by the Department of Trade and Industry (now the Department of Energy and Climate Change) and its administrated by Ofgem who issue Renewables Obligation Certificates (ROCs) to renewable electricity generators for every megawatt hour (MWh) of eligible renewable electricity they generate. The issue of a ROC is optional and is available for each eligible MWh of generation rounded up to the nearest MWh. The RO is a closed UK-only system.

The obligation level is set each year by the Department of Energy and Climate Change (DECC) using a fixed target or a headroom calculation. In 2010-11 the headroom calculation was applied to take account of the prediction of a large amount of new renewable generation coming online. The Obligation level for suppliers to customers in England and Wales for the period from 1 April 2015 to 31 March 2016 will be 0.290ROCs/MWh¹².

Suppliers can meet their obligation by either presenting Renewable Obligation Certificates (ROCs); paying a buyout price (GBP 43.30 per MWh for 2014/2015 and GBP 44.33 per MWh in 2015/2016¹³ rising each year with inflation); or a combination of the two. ROCs are issued to generators for every generated MWh of eligible renewable electricity. These ROCs can then be sold to suppliers or traders to receive a premium on top of the wholesale price of their electricity. ROCs can be sold with or without the electricity they represent.

At the end of an obligation period the money in the buyout fund is recycled to those suppliers who presented ROCs on a pro rata basis. Suppliers that do not present ROCs pay into the buy-out fund at the buy-out price, but do not receive any portion of the recycled fund.

The scheme has been subjected to various amendments over the years, the most significant being in April 2009 through the introduction of 'banding' where different levels of financial support was awarded to generators based on their generation technology. Further changes in April 2010 included extending the scheme, from 31 March 2027, in England and Wales and Scotland until 31 March 2037.

Several legislative amendments were implemented during the 2010-11 and 2011-12 obligation periods. These included the transfer of support for photovoltaic (PV), hydro and wind micro generation (with capacity less than 50kW) in Great Britain (GB) from the RO to the new Feed-in Tariff (FIT) scheme, with effect from 1 April 2010, and the introduction of sustainability requirements for bioliquids in April 2011.

The RO will close to new generation on 31 March 2017. Generation which is accredited under the RO will continue to receive its full lifetime of support in the "vintaged" scheme after 2017. The scheme will close in 2037.

Feed-in-Tariff

The Feed-in-Tariff (FIT) scheme was introduced on 1st April 2010, though the Energy Act 2008, to encourage the deployment of additional small-scale (up to 5 MW) low-carbon electricity generation, particularly by organisations, businesses, communities and individuals that have not traditionally engaged

¹¹ DECC Website: www.decc.gov.uk

¹² Ibid

¹³ Ofgem Information Note: <https://www.ofgem.gov.uk/environmental-programmes/renewables-obligation-ro/information-suppliers>

in the electricity market. It is expected that by 2020 the scheme will support over 750,000 small-scale low carbon electricity installations and will have saved 7 million tonnes of carbon dioxide.

This scheme, introduced by DECC and administrated by Ofgem, is voluntary for generators and small suppliers (<50,000 domestic customers). For large electricity suppliers who will make the payments directly to generators it is an obligatory scheme. This is then recovered equitably across all electricity suppliers

This scheme requires Licensed Electricity Suppliers (FIT Licensees) to pay a generation tariff to small-scale low-carbon generators for electricity generated. An export tariff is also payable where electricity is exported to the national grid. The FIT provides support for a set period of time (10, 20 or 25 years depending on technology) at a determined level of support dependent on the technology installed. This scheme replaces the Low Carbon Buildings Programme (LCBP) grants, which have since been discontinued.

Installations using solar photovoltaic (PV), wind, hydro, anaerobic digestion (AD) technologies up to 5MW and fossil fuel derived Combined Heat and Power (CHP) up to 2kW (up to a maximum of 30,000 eligible installations) can receive FIT payments, providing all eligibility requirements are met. This scheme replaces the Renewables Obligation (RO) as the main mechanism of support for PV, wind and hydro installations with a declared net capacity (DNC) of 50kW or less ('micro installations'). The scheme also provides eligible small-scale generators with a capacity over 50kW to 5MW ('small installations') the one-off choice of applying under the FIT or the RO.

In order to be eligible for the FIT, customers ("Generators") must ensure that the Product they are installing is certified by the Microgeneration Certification Scheme (MCS), and that the Installer is also MCS certified.

Since it was introduced the FIT scheme has undergone a number of changes, being the latest one the 2011 Amendment Order, which makes a series of modifications to the Feed-In Tariffs (Specified Maximum Capacity and Functions Order 2010, intended to ensure this policy intent is fully reflected in the operation of the FITs scheme, particularly in light of the additional clarification provided following the European Commission's consideration of the FITs scheme in relation to state aid (decision N94/2010).

Levy Exemption Certificates

The Climate Change Levy (CCL) was introduced on 1st April 2001 by the Government under the Finance Act 2000. It is a charge on non-domestic supply of electricity in the UK. Electricity is currently (with effect from 1st April 2012) subject to a levy at a rate of GBP 5.09/MWh.

The Renewable Levy Exemption Certificates (Renewable LECs) are electronic certificates issued by Ofgem, which issue these certificates monthly to accredited generating stations for each Megawatt hour (MWh) of renewable source electricity generated. In the case of NFFO/SRO (Non Fossil Fuel Obligation and the Scottish Renewables Obligation) generating stations Ofgem issues LECs directly to the electricity suppliers entitled to receive them. LECs identify renewable source electricity produced by accredited renewable generating stations

As LECs are only issued to accredited generating status, before they can receive LECs, the generating station must apply for accredited status.

Renewables LECs are part of the evidence required by HM Revenue & Customs to demonstrate the amount of renewable source electricity supplied to non-domestic customers in Great Britain. They are used by electricity suppliers to claim the CCL Exemption on non-domestic supply. Suppliers allocate Renewables LECs to a supply pursuant to a renewable source contract.

Ofgem Renewables and CHP Register is used to manage the renewable and CHP schemes that Ofgem administers on behalf of government, namely the Renewables Obligation (RO), the Climate Change Levy (CCL) and the Renewable Electricity Guarantees of Origin (REGOs). Details on the LECs can be found at Ofgem website.

Renewable Heat Incentive

The Renewable Heat Incentive (RHI) encourages individuals, communities and others who are not professionals in the energy business, to play their part in bringing forward renewable energy, by providing a financial incentive to switch from using fossil fuels for electricity and heat, to renewable technologies

and sources. The Energy Act 2008 provides the statutory basis for a Renewable Heat Incentive scheme to be introduced across England, Wales and Scotland. The first phase of the scheme came into force in 2011

This scheme is similar to the FIT scheme. However there are some important differences:

- will be paid for by the Treasury not by energy users.
- there is no 'National Grid for Heat' and so importing and exporting heat is not relevant.
- will be introduced in phases, with residential schemes not eligible until Phase 2.

The renewable energy technologies eligible for the scheme are: heat pumps (excluding air source heat pumps), solar thermal (below 200kW), biomass boilers (below 200kW), CHP and technologies such as biogas, biomethane and bioliquids. The incentive is technology dependent and varies according to the scale of the system installed.

Payments made as part of the RHI Scheme will be claimed by, and paid to, the Owner of the equipment. For small and medium sized installations, both the Product (equipment) and Installer will need to be certified under the Microgeneration Certification Scheme (MCS), in order to ensure quality assurance and consumer protection.

Payments will be paid over a number of years; annually for installations below 45 kW and quarterly for those above this level. Payments are calculated based on the annual amount of heat output, expressed in kilowatt hours (kWh):

- for Small and Medium Installations, the amount of heat generated by the equipment will be estimated (or "Deemed"). This will allow the beneficiary of the Incentive to receive a set amount based on the deemed output, while discouraging any excess production or energy waste.
- for Large installations and process-heating, the heat output will be metered, and the total annual support calculated from the actual energy generated, multiplied by the tariff level.

This Scheme is administered by Ofgem, including making Incentive payments to recipients and taking responsibility for auditing and enforcing the Scheme.

2 Proposals for Improvement of the Tracking System

The following proposals are made in accordance with the RE-DISS Best Practice Recommendations (BPR v2.2 of August 2014), which have been agreed by the Participating Domains of the RE-DISS Project.

There are several tracking systems in place in GB. These tracking systems are clearly regulated. The following are recommendations to align the tracking systems with RE-DISS BPR:

- BPR [16]: In the medium to longer term, GO should be the only "tracking certificate" used. Any other tracking systems of a similar purpose and function as GO should be closely coordinated with GO to avoid double selling and eventually converted to GO. In GB, Government introduced Levy Exemption Certificates (LECs) which are used by suppliers to obtain a discount to the Climate Change Levy on behalf of non-domestic customers. Further, Renewable Obligation Certificates (ROCs) are in use to subsidise renewable plants. Although these certificates are associated with renewable energy, they are not intended to be tracking certificates.
- BPR [19]: GB should clarify whether and under which conditions the use of GO by end consumers is allowed. Such GO use should not be based on ex-domain cancellations performed in other countries. If consumers are allowed to use GO themselves, a correction should be implemented in the disclosure scheme which compensates for any "double disclosure" of energy consumed. Ofgem has systems in place that allow consumers to use GO. However, the Government's carbon reporting guidelines do not currently cater for the purchase of GO by consumers to claim lower carbon emissions. Therefore, whilst possible in theory, that does not happen in practise.

2.1 Proposals regarding Disclosure

In terms of disclosure, the GO system in place for GB is not fully in line with the RE-DISS BPR. The following are recommendations to align the existent disclosure system with RE-DISS BPR:

- BPR [3a]: Lifetime of GO should be limited to 12 months after the end of the production period, instead of the 16 months considered in the current system. After the 12 months GOs that have not been cancelled yet should expire and be collected in the Residual Mix
- BPR [5b]: Deadline for cancellation of GO for the purposes of Disclosure of year X should be set to 31 March of year X+1. Deadline to supply the information in GB is the 1st of July of X+1.
- BPR [33]: Electricity disclosure should be based on calendar years. At the moment in GB disclosure is based on financial years.
- BPR [34, 35] In terms of timing for disclosure:
 - The deadline for cancelling GO for purposes of disclosure of a given year should be the 31st of March of the following year (instead of the 1st of June);
 - The timing for the calculation of Residual Mixes should be coordinated across Europe:
 - By 30 April X+1 GB should have determined its preliminary domestic residual mix and whether they have a surplus or deficit of attributes.
 - By 15 May X+1, the European Attribute Mix should be determined and should be used by DECC for the calculation of the residual mix (instead of the GB residual mix).
 - By 31 May X+1, the final domain residual mixes should be published.
 - As of 1 July X+1 the disclosure figures relating to year X should be published by DECC.
- BPR [26a]: The calculation of the Residual Mix should follow the methodology developed in the RE-DISS project.
- BPR [27]: For purposes of this cross-border adjustment, GB should use data provided by RE-DISS. At the moment, although the GB participate in the collection of data for the RE-DISS European RM calculation, for cross-border adjustment GB make use of the GB residual mix for the excess of lack of attributes.

2.2 Proposals regarding RE-GO and CHP-GO

The RE-GO and CHP-GO system in place for GB is not fully in line with the RE-DISS BPR recommendations. To improve the RE-GO system in place for GB, the following RE-DISS recommendations should be followed:

- BPR [1a]: Metered production periods for issuing GOs should not be longer than a calendar month. At the moment it depends, metering periods can go over the disclosure period. GO in GB are issued for a calendar month or annual period (April - March).
- BPR [3a]: The GOs for GB should only have a 12 month lifetime – instead of the 16 months lifetime;
- BPR [4]: An extension to this lifetime can be granted if a GO could not be issued for more than [six] months after the end of the production period for reasons which were not fully under the control of the plant operator. In this case, the lifetime of the GO might be extended to [six] months after issuing the GO.
- BPR [7, 7a, 7b]: The RE-GO system should be based on EECS operated by AIB. GB At the moment GB is not an EECS members. The implementation of a GO system based on EECS will help harmonise the system for European GO transfers, especially between EECS members. GB should use the AIB Hub for international transfers.

- BPR [10.1]: GO should generally be issued only for the net generation of a power plant, i.e. gross generation minus the consumption of all auxiliaries related to the process of power production. For hydro power plants involving pumped storage this means that GO should be issued only for the net generation which can be attributed to natural inflow into the reservoir. At the moment in GB GO are issued for gross renewable energy generation.
- BPR [11a]: to extend the system of GO to other forms of electricity generation.
- BPR [11b]: GOs should be issued for all electricity production, unless an RTS applies for that production, e.g. for the disclosure of supported electricity.
- BPR [11c]: Competent bodies should consider to make the use of GOs mandatory for all electricity supplied to final consumers.
- BPR [12.2]: Technical changes to plants need to be registered as soon as is reasonably practicable.
- BPR [13.5]: An exported GO should be marked as removed from the exporting registry.
- BPR [13.7]: Registries should be audited on a regular basis.
- BPR [15b] Although in GB only one GO is issued per unit of electricity this GO should combine the functionalities of a RES-GO and a CHP-GO.

2.3 Proposals regarding Acceptance of GO

Regarding acceptance of GO the following should be considered:

- Within the rules set by the respective Directives, GB should consider establishing their criteria for the acceptance of imported GO for purposes of disclosure:
 - These criteria should address imports at least from all EU member states, other members of the European Economic Area (EEA) and Switzerland. The parties to the Energy Community Treaty should be considered as well, as soon as GO imports from these countries become relevant.
 - The criteria should specify the electronic interfaces, specifying data format and contents of GO to be imported, which the respective country accepts for imports of GO (such as the EECs Hub and any other interfaces accepted).
- Conditions for the recognition of GO from other countries should be that they were issued based on Art. 15 of Directive 2009/28/EC or compatible national legislation, and that they meet the explicit requirements set in Art. 15, e.g. regarding the information content of the GO.
- The recognition of GO from other countries should be rejected in case that these countries have not implemented an electricity disclosure system.
- The recognition of GO from other countries should be rejected in case that the country which has issued the GO or the country which is exporting the GO have not implemented adequate measures which effectively avoid double counting of the attributes represented by the GO. Such adequate measures should ensure the exclusivity of the GO for representing the attributes of the underlying electricity generation, implement clear rules for disclosure, establish a proper Residual Mix or equivalent measures, and ensure their actual use. Furthermore, the adequate measures should ensure that attributes of exported GO are subtracted from the Residual Mix of the exporting country and cannot be used for disclosure at any time in the issuing or the exporting country by explicit mechanisms, unless the GO is re-imported and cancelled there.

Regarding acceptance of GO the following BPR should be implemented:

- BPR [20a]: Great Britain should choose one of the two following options and apply it consistently for all foreign GO:
 - Rejection of GOs only relates to the cancellation of GOs and subsequent use for disclosure purposes in the respective country and should not restrict the transfers of GOs between the registry of the considered country and the registries of their countries. This means that the decision about the recognition of a GO should not hinder its import into the considered country.

- Rejection of GOs implies blocking their import to the national registry.
- BPR [20b]: The choice of one or the other option should be transparent for all market parties and clearly communicated.
- BPR [21] Within the rules set by the respective Directives, Great Britain should consider their criteria for the acceptance of imported GOs for purposes of disclosure.
 - The recognition of GOs from other countries should be rejected if these countries have not implemented an electricity disclosure system.
 - The recognition of GOs from other countries should be rejected if the country which has issued the GOs or the country which is exporting the GOs have not implemented appropriate measures which effectively avoid double counting of the attributes represented by the GOs. Such appropriate measures should ensure the exclusivity of the GOs for representing the attributes of the underlying electricity generation, implement clear rules for disclosure, establish a proper Residual Mix or equivalent measures, and ensure their actual use. Furthermore, the appropriate measures should ensure that attributes of exported GOs are subtracted from the Residual Mix of the exporting country and cannot be used for disclosure at any time in the issuing or the exporting country by explicit mechanisms, unless the GOs are re-imported and cancelled there.

2.4 Further proposals regarding Disclosure

- BPR [38]: All electricity products offered by suppliers with claims regarding the origin of the energy (e.g. green or low-carbon power) should be based exclusively on cancelled GO. No other tracking systems should be allowed, with the exception of mechanisms defined by law, e.g. a pro-rata allocation of generation attributes to all consumers which is related to a support scheme.
- BPR [44]: Great Britain suppliers should apply the steps defined in the RE-DISS BPR in order to determine their disclosure figures.

2.5 Matrix of disclosure related problems and country-specific proposals

Problem	Country-specific proposal
Possible double counting in different explicit tracking instruments	BPRs: [7], [7a], [7b], [10.1], [11a], [13.5], [13.7], [12.2], [16], [21], [38]
Double counting of attributes in implicit tracking mechanisms	BPRs: [5b], [11a], [13.5], [21], [26a], [27], [44]
Double counting within individual supplier's portfolio	BPRs:
Loss of disclosure information	BPRs: [11a], [15b], [19]
Intransparency for consumers	BPRs: [11a], [11b], [11c], [12.2], [13.5]
Leakage of attributes and/or arbitrage	BPRs: [1a], [3a], [5b], [19], [33], [34], [35]
Unintended market barriers	BPR: [4], [7], [7a], [7b], [11b], [11c], [20a], [20b], [21]

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