

# Biomass Sustainability in the UK

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ofgem



## Agenda

- Introduction to Ofgem E-Serve
- Summary of biomass use and import of solid biomass in UK
- UK's background of sustainability criteria implementation
- What are the sustainability criteria
  - Land criteria for non woody biomass
  - Land criteria for woody biomass (including regional risk based approach and 70/30 threshold)
  - Greenhouse gas (GHG) criteria
- Consignments
- Mass balance
- Fuel Classification
- Reporting and compliance
- Sustainability reporting to date

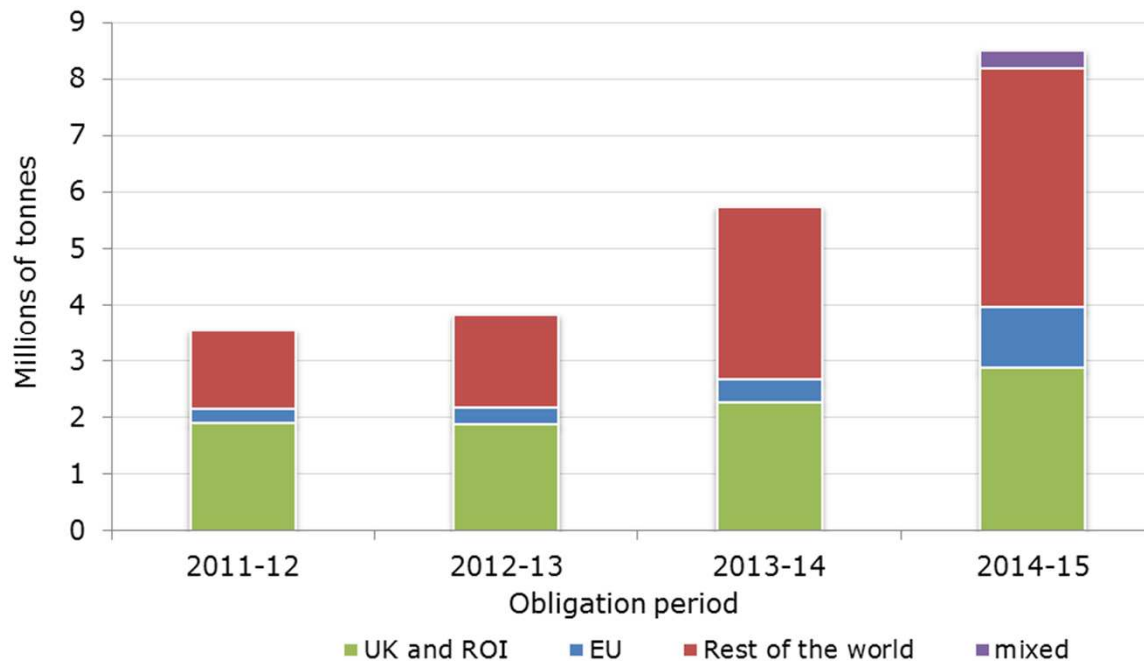
## Introduction to Ofgem

- Ofgem is the Office of Gas and Electricity Markets. We are a non-ministerial government department and an independent National Regulatory Authority.
- Ofgem E-Serve is responsible for administering green energy and social schemes on behalf of the government. These range from renewable energy incentives to energy efficiency and social programmes.
- The Renewables Obligation (RO) is one of the main support schemes for large-scale renewable electricity generation in the UK. It puts an obligation on licensed electricity suppliers to source a proportion of their supply from renewables.
- We administer this scheme on behalf of the Department for Business, Energy and Industrial Strategy (BEIS).

## Summary of Biomass use under the RO

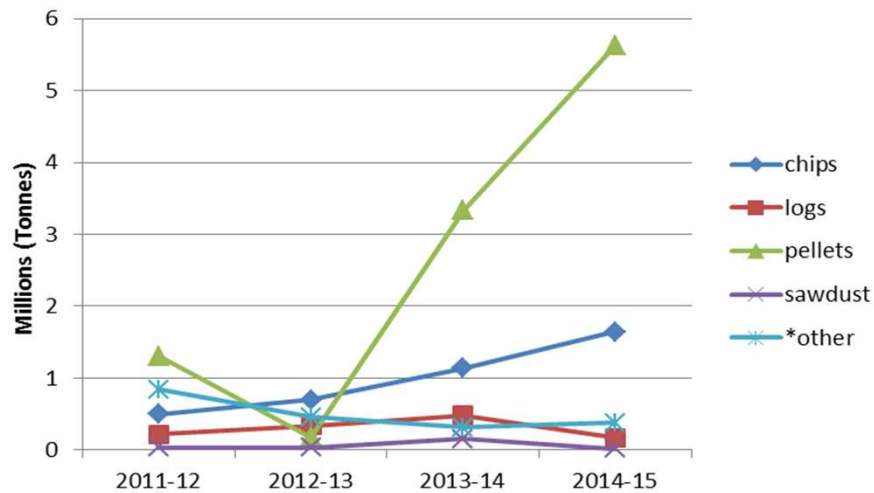
- Biomass is defined as something that has at least 90% by energy content derived from plant matter, animal matter, fungi, algae or bacteria. Can be solid, liquid or gas.

**Origin of solid biomass used from 2011-12 to 2014-15  
(excluding waste)**



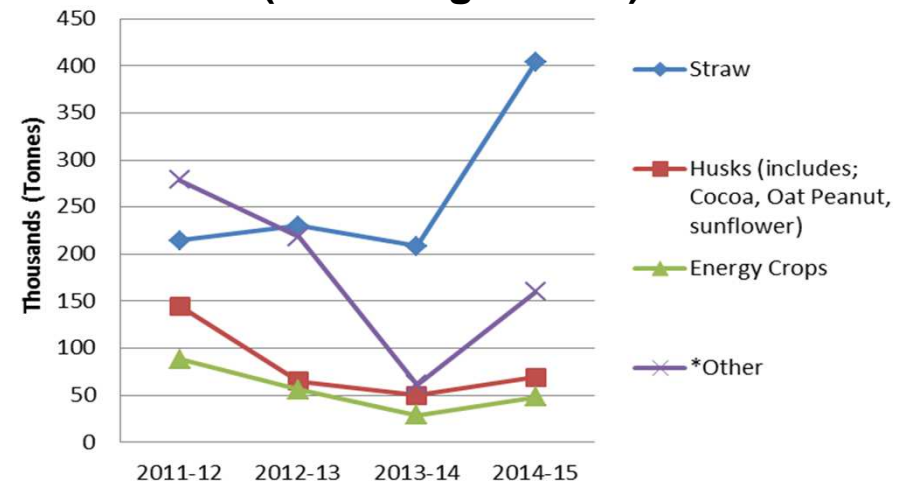
## Biomass use in the UK Continued

**Types of wood used from 2011-12 to 2014-15 (excluding wastes)**

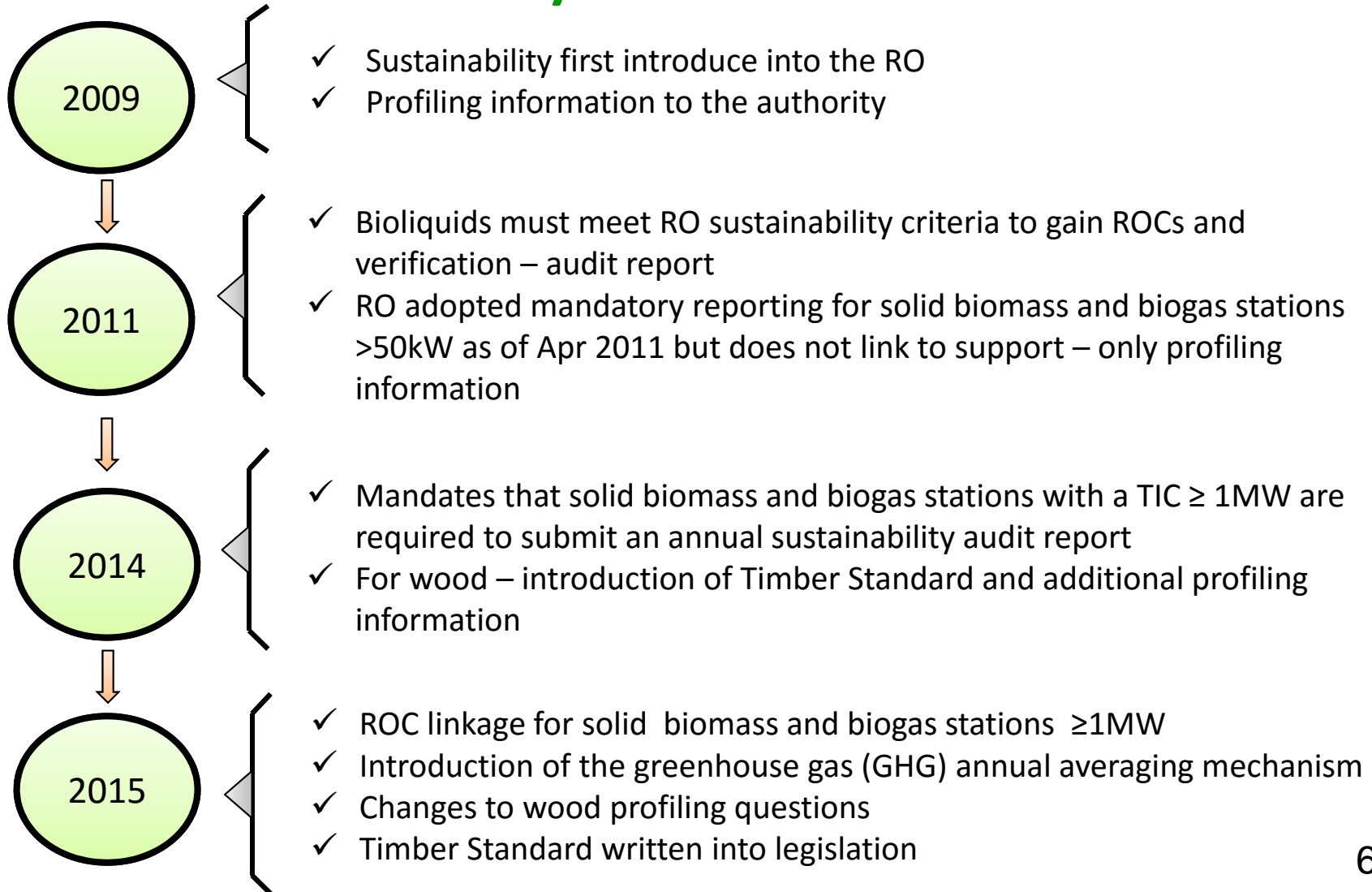


Stations used approximately 165.9 million m<sup>3</sup> of biogas, 152.1 million liters of bioliquid and 10.4 million tonnes of solid biomass for electrical generation in 2014-15

**Types of non-wood solid Biomass used from 2011-12 to 2014-15 (excluding wastes)**



## Biomass sustainability in the UK



## What are the sustainability criteria?

The sustainability criteria have come from the European Renewable Energy Directive (RED) and are written into the UK's legislation. It has two parts:

**1 Land criteria** – This focuses on the land from which the biomass was sourced. The aim is to protect areas of high biodiversity and high carbon stock. The legislation sets out prohibited land types for non woody biomass, and forest management requirements for woody biomass.

**2 Greenhouse Gas criteria** – This accounts for the life-cycle greenhouse gas emissions of the biomass using a set methodology.

*“Introduced through the Renewable Energy Directive (RED) for bioliquid sustainability Criteria”*



## Land Criteria for non-woody biomass

- RO land criteria for non-woody biomass prohibits sourcing biomass from certain land types, known as a protected source.

Biomaterial is obtained from a protected source if it has come from land which:

- At any time during or after January 2008 the land was a primary forest or land designated for nature protection purpose,
- At any time in January 2008 was a highly biodiverse grassland, or a peatland,
- Was a former continuously forested area, former lightly forested area or a former wetland

Where a land use change has occurred that is not permitted under the land criteria, the biomass has not met the land criteria.

**Compliance** with this criteria can be shown by aerial photographs, satellite images, maps, Land Register entries/databases, and site surveys.



## Land Criteria for woody biomass

Woody Biomass should come from a sustainable source to meet the land criteria. Sustainable Source is defined within Schedule 3, Article 6 of the ROO 2015.

There are two parts to showing the wood is from a Sustainable Source:

1.) Meeting the sustainability requirements by showing that:

- Harm to ecosystems is minimised
- The productivity of the area is maintained
- The health and vitality of ecosystems is maintained
- Biodiversity is maintained
- Those responsible for the management of the area comply with the local and national laws relating to health and safety and welfare of the workers and have regard to the legal, customary and traditional rights of tenure and land use.
- There is regular assessment of the extent to which the above requirements are met.

2.) The wood is grown in an area that is managed in a way that is consistent with the Forest Europe Sustainable Forest Management criteria or another set of international principles that meet the requirements.

## Land Criteria for woody biomass continued

### Regional Risk Based Approach

- Compliance to the Sustainable Source criteria can be met at a regional level (i.e. does not have to be met at the forest level). Have to have sufficient credible evidence that there is a low risk of non-compliance with the sustainable source criteria for a defined region. All wood has to be traceable back to a region/supply base.

**A region** can be defined as the largest area in which reliable and independent information is available so show that conditions are sufficiently homogenous to evaluate the risk of non-compliance with the sustainable source criteria. For instance in a single region it is expected that the following should be the same:

- Legislation covering land ownership, use and harvesting rights
- Legislation covering biodiversity, water, air and soil protection
- Legislation covering basic labour rights and health and safety of forest workers
- Legislation covering waste handling and disease control
- Legislation covering tress felling licensing and replanting/regeneration requirements.

## Land Criteria for woody biomass continued

### 70/30 Threshold

- 70/30 refers to the threshold of sustainable wood to unsustainable wood. i.e. 70% of the wood used has to meet the sustainable source criteria. 100% of the wood used has to be legal and meet the [EU Timber Regulation](#).
- The 70% threshold can be on a consignment basis or on the total wood burnt in the reporting period (for the RO this is a month).

**Compliance to the sustainable source criteria** can be demonstrated by:

- Woody Biomass Category A evidence – FSC or PEFC
- Woody Biomass Category B evidence – bespoke evidence

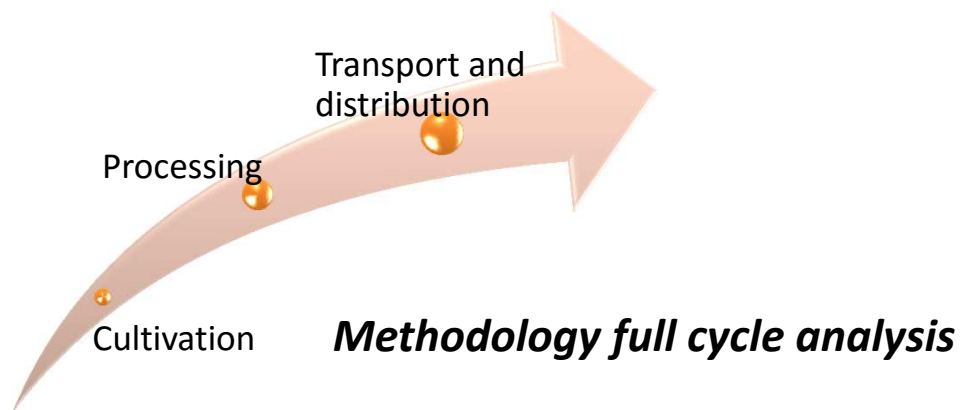
Ofgem E-serve conducted a benchmarking exercise and the Sustainable Biomass Partnership met all the sustainable source criteria and can be included as Category A evidence.



## Greenhouse Gas (GHG) Emissions Criteria

Account for life-cycle GHG emissions of biomass. There are different GHG units and thresholds depending on the fuel type:

- Solid biomass and biogas is on Carbon intensity (gGHG/MJ electricity)
- Bioliquids is as a percentage saving against the fossil fuel comparator



Current thresholds:

Bioliquid = 35%

Solid biomass/biogas = 79.2 gGHG/MJ e.

## Greenhouse Gas (GHG) Emissions Criteria continued

There are three calculation methods:

- Default** values – values included in the legislation,
- Actual** values – methodology set out in Part C of Annex 5 of the RED. Calculates each step of the life cycle separately (i.e. cultivation, processing, transport etc.)
- Mixed** value method – uses both default and actual method (only for bioliquids).

Bioliquid production pathway	Default carbon intensity (CI) [gCO <sub>2eq</sub> /MJ]	Disaggregated default values [gCO <sub>2eq</sub> /MJ]			GHG saving [%]
		Cultivation	Processing	Transport and distribution	
Sugar beet ethanol	40	12	26	2	52%
Sugar cane ethanol	24	14	1	9	71%
Biomass Production Pathway			Default carbon intensity (CI) [gCO <sub>2eq</sub> /MJ feedstock]		
Wood chips from forest residues (European temperate continental forest)			1		
Wood chips from short rotation forestry (European temperate continental forest)			4		

## Consignments

- Fuel needs to be reported per consignment and a consignment is based on the **‘sustainability characteristics’** of the material.
- Ofgem E-serve consider the following characteristics should be taken into account when determining consignments:
  - Country of origin
  - Feedstock type (e.g. wood, used cooking oil, food waste)
  - Biomass form (solid biomass only)
  - Classification of the fuel (waste, residue, product etc.)
  - Compliance with land criteria
  - Compliance with GHG criteria

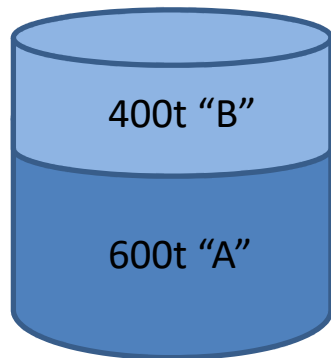
Determining a consignment is important because sustainability information is gathered and reported against the consignment. What needs to be reported can change based on the fuel classification of the consignment.

## Mass balance

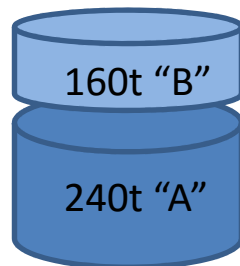
- Mass balance is a system in which sets of sustainability characteristics remain assigned to consignments. The sum of all consignments withdrawn from the mixture is described as having the same sustainability characteristics, in the same quantities, as the sum of all consignments added to the mixture. I.e. you can not have more output of a certain consignment then you had input.
- Mass balance systems are only needed where consignments are being mixed (this could be on site or in the supply chain). A mass balance system is used to ensure that the biomass and its associated sustainability information is verifiable.
- There are two types of mass balance systems that can be used:
  - Proportionate
  - Non proportionate

**Proportionate** mass balance system

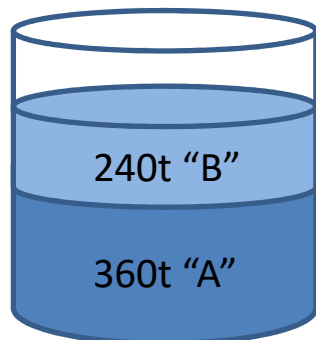
Opening stock = 1000t



Fuel combusted in a month = 400t

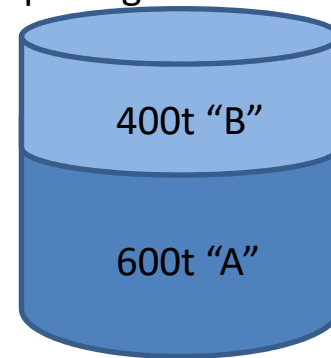


Closing stock = 600t

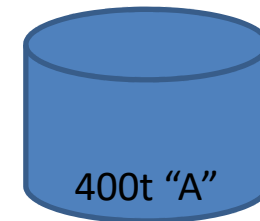


**Non-Proportionate** mass balance system

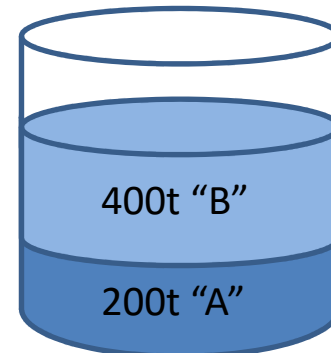
Opening stock = 1000t



Fuel combusted in a month = 400t



Closing stock = 600t





## Fuel Classification

Fuel Category	BIOLIQUID		SOLID BIOMASS / BIOGAS	
	Land Criteria	GHG Criteria	Land Criteria or Timber Standard	GHG Criteria
<b>Waste</b>	Exempt	Emissions during and from the process of collection only	Exempt	Exempt
<b>Processing residues</b>	Exempt	Emissions during and from the process of collection only	Exempt from land criteria If wood then must report against timber standard	Emissions during and from the process of collection only
<b>Residues from agriculture</b>	Reporting required	Emissions during and from the process of collection only	Reporting required	Emissions during and from the process of collection only
<b>Residues from forestry</b>	Reporting required	Full life-cycle emissions	Reporting required	Emissions during and from the process of collection only
<b>Residues from arboriculture</b>	N/A	N/A	For non-woody biomass: from land criteria  For woody biomass: deemed sustainable and meets land criteria for woody biomass	Emissions during and from the process of collection only
<b>Residues from aquaculture and fisheries</b>	Reporting required	Full life-cycle emissions	Reporting required	Emissions during and from the process of collection only
<b>Products, co-products</b>	Reporting required	Full life-cycle emissions	Reporting required	Full life-cycle emissions

## Reporting and compliance

- Generators report against the land criteria and GHG criteria every month when they provide information to us on the fuels used and their electricity generation.
- On a monthly basis we do not require evidence they have met the criteria, instead, at the end of the year operators are required to submit an 'Annual Sustainability Report'.
  - This report is carried out by an auditor independent to the generating station, and they verify the sustainability information that has been reported to us on a monthly basis.
  - The audit is carried out in accordance to the ISAE 3000 (Revised) standard.
  - If the report is not submitted or it is found that fuel has been used that has not met the sustainability criteria, we would suspend support under the scheme until the information had been provided or we have recouped the payments associated with the unsustainable fuel.
- Stations are also required to submit profiling data annually, which is additional sustainability information related to their fuel. We publish this data on our website.

## Sustainability to date

- In the UK, reporting against the sustainability criteria has been mandatory since 2011 for renewable electricity stations under the Renewables Obligation.
  - Since 2011, support has been linked to the criteria for bioliquids (i.e. bioliquids had to meet the criteria in order to be given support), but was not linked for solid and gas fuels.
- In October 2015 meeting the criteria became mandatory for biomass used in the Renewable Heat Incentive scheme
- In December 2015 meeting the criteria became mandatory for solid and gas stations greater than or equal to 1 Megawatt under the RO.
- The UK was the first EU member state to introduce sustainability criteria for solid biomass and biogas, and it is expected that the EU will implement mandatory criteria for solid biomass and biogas sometime between 2020 and 2030.

**Ofgem is the Office of Gas and Electricity Markets.**

**Our priority is to protect and to make a positive difference for all energy consumers. We work to promote value for money, security of supply and sustainability for present and future generations. We do this through the supervision and development of markets, regulation and the delivery of government schemes.**

**We work effectively with, but independently of, government, the energy industry and other stakeholders. We do so within a legal framework determined by the UK government and the European Union.**