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Guidance

Biomethane from waste – Resource Framework

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This Resource Framework applies to England

**1. The Purpose of the Resource Framework**

The Resource Framework has four main purposes:

To clarify the point at which waste management controls are no longer needed;

To provide users with confidence that the biomethane they use conforms to an approved product standard and, if specified, a customer specification;

To provide users with confidence that the material is suitable for use in the designated applications; and

To protect human health and the environment.

**2. Review and update of the Resource Framework**

This Resource Framework will be reviewed in three years from the date of publication.

However, this document may be subject to change before these review dates. Triggers for such a change could include**:**

* pollution incidents;
* development in scientific understanding;
* a change in the market;
* a change in legislation or case law; or
* a change to the agreed industry standard or input materials.

 The Environment Agency will seek support from industry in reviewing this document.

 This Resource Framework may be withdrawn if it becomes apparent that it is generally being misapplied and/or misused.

# 3. When the final product is no longer waste

Biomethane arising from the degradation of organic wastes in a landfill site or anaerobic digestion plant, for injection into the gas grid or use in an appliance suitably designed and operated for natural gas is no longer subject to waste controls when you can show that the requirements for the designated application have been met.For the purpose of this Resource Framework there are two designated applications which are:

## 3.1 Biomethane for injection into the gas grid

Biomethane for injection into the gas grid (also referred to as Biomethane to Grid or BtG) which is to be:

* Destined as a fuel or raw material of a quality acceptable to the grid (national gas transmissions system, local gas transmission systems and local gas distribution network), meeting the requirements of a Network Entry Agreement and the Gas Safety (Management) Regulations 1996
* Meet an approved product standard specified for the particular end use (see Section 5 below and Section 6);
* Be accompanied by evidence of compliance through records management (as detailed in Section 9).

**3.2 Biomethane for use as a fuel in an appliance (****BfA) suitably designed and operated for natural gas**

Biomethane for use as a fuel in an appliance that is suitably designed and operated for natural gas which includes:

* Compression and spark ignition engines;
* Gas turbines;
* Fuel cells; and
* Heating appliances
* Note that use of biomethane as a fuel in suitably designed appliances covers its use in vehicles

In order for biomethane to cease to be waste and used as fuel in an appliance it must:

* Meet an approved product standard for the particular designated application (see Section 5 below and Section 6)
* Comply with the requirements of the appliance manufacturer’s warranty, if required
* Be accompanied by evidence of compliance through records management as detailed in Section 9; and
* Be accompanied by evidence of compliance with operational requirements contained in the warranty, or other operating instructions, through records management as detailed in Section 9.

**3.3 Additional Processing requirements**

Biomethane may be subject to additional processing in order to meet the requirements of an approved product specification and, if required, a customer specification.

This could be to:

* Remove trace contaminants;
* Adjust the calorific value of the gas; or
  + - * Convert the form of the gas into a condition ready for use in an appliance or vehicle.

Such processing is classified as a waste recovery operation and is subject to the waste management controls in the Waste Framework Directive and domestic legislation.

**4. Input Material**

Apply waste acceptance criteria in accordance with permit requirements and the industry standard. The generation, collection and treatment of biogas and the upgradingof that gas to biomethane are subject to control under an environmental permit. This Resource Framework does not affect the obligation on producers to comply with all the conditions of an environmental permit.

**5. How to meet the Resource Framework**

**5.1 Product standards:**

As there are currently no published approved product standards in England relating to production or use of biomethane for the designated applications, compliance with this Resource Framework requires that biomethane meets the product specification for the designated application as set out in Section 6. This specification is based on a detailed analysis of biogas composition and an environmental and health risk assessment of biomethane use in the designated applications.

**5.1.2 Product Specification**

The specifications for the applications covered by this Resource Framework are set out in Section 6. When this Resource Framework is reviewed in line with the schedule set out in section 2, these specifications will be reviewed to ensure suitability. If additional standards are developed in the future, these will need to be approved by the Environment Agency for inclusion in this Resource Framework when it is reviewed (see Section 2 above).

**5.1.3 Additional Specification**

Customers may set additional specifications for biomethane. Such specifications may relate to the composition of the gas or additional performance standards of the fuel. Where required, the producer must meet these additional customer specifications.

**6. Standards and Specifications**

Producers of Resource Framework compliant biomethane must have the facility to analyse biomethane for all test parameters specified, either through in-house resources or through an external service provider. Techniques used for sampling and analysis should be in accordance with Environment Agency guidance for the monitoring of trace components in landfill gas. Alternative sampling or testing regimes that can be demonstrated to meet the requirements of this Resource Framework may be considered by the Environment Agency on a case-by-case basis.

## 6.1 Commissioning testing

When a plant for the production of Resource Framework compliant biomethane is developed or materially changed, initial commissioning testing must be carried out to characterise the gas produced. Once steady state gas production is reached, gas samples must be taken and analysed to demonstrate compliance with this Resource Framework and to assess operational monitoring requirements in accordance with the next paragraph. One output from the gas characterisation study shall be the demonstration that the biomethane produced does not include levels of compounds that are materially different to those set out in 6.2 below.

## 6.1.2 Operational monitoring

As part of the gas characterisation, an operational monitoring regime (including sampling methods, frequency, analytical method, and report keeping) must be defined for the compounds specified in 6.2. The minimum frequency of sampling and analysis will be annual in all cases. Where the compositional analysis demonstrates that the risk of inaccuracy and imprecision of annual sampling are not material to demonstrating conformance with limits in 6,2, then annual sampling and analysis may be continued. Where this cannot be demonstrated, then the frequency of sampling and analysis must be increased to a level to provide confidence that the biomethane conforms with the required limits.

## 6.1.3 Specification for Biomethane

The composition of biomethane for injection into the gas grid and for use in appliances must comply with the requirements of 6.2 below. The Limits are expressed as the concentration of the components in biomethane at a temperature of 288 K, 101.3 kPa, 5% v/v oxygen and dry gas (0% v/v moisture).

## 6.2: Specification for biomethane for injection into the gas grid and for use in appliances

**Property: ￼**  **Limit (max)**

**Sulphur containing compounds**

Total Sulphur 30 mg m-3

Hydrogen Sulphide 5 mg m-3

**Inorganic Gases**

Ammonia 20 mg m-3

Hydrogen Chloride 1.5mg m-3

Hydrogen Fluoride 5 mg m-3

**Halogenated Hydrocarbons**

Total halogenated Hydrocarbons 1.5 mg m-3

**Atomic Hydrocarbons**

Xylenes (all isomers) ￼ 100 mg m-3

**Metals**

Arsenic 0.1 mg m-3

# 7. Unused Resource Framework compliant biomethane: loss of non-waste status

Resource Framework compliant biomethane will become waste again and subject to waste management controls if at any stage

* You discard it
* You plan to discard it
* It is required to be discarded
* It is stored indefinitely with little prospect of being used.

Where this Resource Framework is not complied with (e.g., the biomethane does not meet a specified product standard, or the processor cannot demonstrate evidence of compliance), the biomethane will be considered to be a waste. (Unless it has been demonstrated to have been completely recovered on a case-by-case basis having regard to Article 6 of the Waste Framework Directive).

In such circumstances, the processor or user must comply with the appropriate waste management controls for the transportation, storage, and use of the biomethane and may be committing an offence if they do not do so.

Contingency planning

You must have contingency for biomethane storage and use at times when the grind connection is unavailable.

These should be documented in your emergency plan and staff trained on when and how these procedures are implemented.

You must have a DSEAR plan that takes alterations in gas use and injection into account.

You must have a standby flare available.

You must not vent biomethane unless it is to protect the plant in a safety critical emergency.

If you choose to use the biomethane in combustion then you must keep a record of this and comply with your permit conditions.

**7.1 Resource Compliant biomethane mixed with waste and non-waste**

If you mix the Resource Framework compliant biomethane gas with

* other waste material, (for example, the mixing of two gases or dissolving the gas within a liquid) the resulting mix will be a waste and subject to waste management controls.
* non-waste material, the resulting mix will not, as a result of this, be waste.

Guidance on waste management controls can be obtained from the Environment Agency’s National Customer Contact Centre on **08708 506 506**, from its website **(http://www.environment-agency.gov.uk/subjects/waste/)**

## 8 Records

To be able to demonstrate compliance with the Resource Framework, processors must retain and supply appropriate records.

**8.1 The records must at least include:**

For batched supplies:

* Date of supply;
* Customer’s name, contact details and nature of business;
* Processor’s name and contact details (including the address of the processing site);
* Details of the designated application for which the biomethane is destined including any applicable warranty conditions;
* Quantity supplied by volume;
* A copy of the material safety data sheet (MSDS) if required by other legislation; and
* A copy of the Statement of Conformity which includes a statement that the biomethane was produced in compliance with this Resource Framework (a template of conformity can be requested from resourcesframeworks@environment-agency.gov.uk) For continuous supplies:
* As above but giving the dates for a given period of supply instead of date of supply.
* Evidence when you are not able to connect to the grid and record kept of flaring activity.

The processor shall retain records of all inspections and testing carried out.

A template for Statement of Conformity and Analysis of Product and Comparison with Resource Framework requirements can be requested by emailing resourcesframeworks@environment-agency.gov.uk

## 8.2 Retention of records

The processor must:

* Keep and retain all the above specified records for a minimum of two years; and
* Make them available for inspection by the regulator (if required)