**Advanced Conversion Technology (ACT) Fuel Measurement and Sampling Questionnaire**

**Section A - Application Information**

This section gathers general information regarding your generating station and the fuels and feedstock(s), to which these procedures relate. The answers must match those stated on your accreditation application.

1. Check the box to confirm that you have read our [guidance note](https://www.ofgem.gov.uk/publications-and-updates/advanced-conversion-technology-act-fuel-measurement-and-sampling-fms-questionnaire-and-guidance-note) on how to complete your ACT FMS questionnaire **🏱** [ ]
2. Name of generating station (as appears on the R&CHP register) **🏱**



1. Declared net capacity (DNC kW) of generating station **🏱**



1. Total installed capacity (TIC kW) of generating station **🏱**



1. Proposed Technology **🏱**Choose an item
2. State of advanced fuel produced **🏱**Choose an item
3. List the feedstock(s) used to produce the advanced fuel **🏱**



1. If your station has a **DNC of >50kW** and a **TIC of <1MW,** tick the box to confirm that you will keep records of the quantity of biomass feedstock(s) used in the gasifier/pyrolyser, so you can report your annual profiling data accurately **[ ]**

**Section B - Version History**

This section should only be completed for any revisions made **after the initial approval of procedures** has been given by Ofgem.

1. Indicate the version number of these FMS procedures N.B. Version 0 is the procedures as originally approved:Choose an item
2. State the purpose of this latest revision and indicate the changes made (making reference to specific question numbers, for example F1).



## Section C – Fuel Classification

For information about this section, including whether you need to complete it given your station size and fuel type, please refer to our [guidance note](https://www.ofgem.gov.uk/publications-and-updates/advanced-conversion-technology-act-fuel-measurement-and-sampling-fms-questionnaire-and-guidance-note) on how to complete your ACT FMS questionnaire.

This section gathers information on whether you are applying a fuel classification with associated exemptions, this is to identify whether the feedstock(s)/process is already accounted for in the [Sustainability Criteria guidance](https://www.ofgem.gov.uk/publications-and-updates/renewables-obligation-sustainability-criteria). We suggest you read chapter 3 of this guidance to help you answer questions **C1** and **C2**.

1. Do you consider all feedstock(s) stated in **A7** to be products or co-products? Choose an item

If you have answered **‘No’** to **C1**, answer **C2**.

1. Are the feedstock(s) that you do not consider to be products or co-products already identified in Appendix 3 of the [Sustainability Criteria guidance](https://www.ofgem.gov.uk/publications-and-updates/renewables-obligation-sustainability-criteria)? Choose an item

If you have answered **‘No’** to **C1** and **C2**, a member of the team will be in touch to discuss the classification.

## Section D – Consignment Assessment and Tracking Sustainability Information

For more information about this section, including whether you need to complete it given your station size and fuel type, please refer to our [guidance note](https://www.ofgem.gov.uk/publications-and-updates/advanced-conversion-technology-act-fuel-measurement-and-sampling-fms-questionnaire-and-guidance-note) on how to complete your ACT FMS questionnaire.

### Consignment Assessment

Questions **D1** to **D8** help determine whether the advanced fuel specified in **A6** is a single consignment or a mixture of consignments, based on the sustainability characteristics of the feedstock(s).

1. With reference to the sustainability characteristics listed in Chapter 6 of the[Sustainability Criteria guidance](https://www.ofgem.gov.uk/publications-and-updates/renewables-obligation-sustainability-criteria), do you consider each feedstock stated in **A7** to be a single consignment? Choose an item
2. If you have answered **‘No’** to **D1**, list the consignments that make up the feedstocks given in **A7.**



For stations  **above or equal to 1MW TIC** using more than one consignment, the syngas volume will need to be apportioned between each consignment according to the relevant energy content of each. The member of staff reviewing your FMS procedures will provide further information should this be the case.

1. If wood pellets are used as a feedstock at the generating station, do they contain binders? Choose an item

If you have answered **‘Yes’** to **D3**, answer **D4**. If you have answered **‘No’** or **‘N/A’** to **D3** skip to **D5**.

1. Is the binder ≤2% by weight of the feedstock consignment to which it is added?

 Choose an item

We require evidence to demonstate that binder is ≤2% by weight of the feedstock consignment to which it is added. If applicable, tick the box to confirm that you have provided this evidence [ ]

N.B. If binders contribute >2% by weight of the feedstock consignment to which it is added, then the sustainability criteria of the binder will need to be reported on a consignment basis.

1. Are feedstock consignments mixed in the supply chain/before arriving at the generating station? Choose an item
2. If you answered **‘Yes’** to **D5**, which of the feedstock consignments, listed in **D2**, are mixed in the supply chain/before arriving at the generating station? This includes mixing with fossil fuel.



1. Are feedstock consignments mixed at the generating station prior to gasification/pyrolysis? Choose an item

If you have answered **‘No’ or ‘N/A’** to **D5** and **D7** go to **Section E**.

1. If you answered **‘Yes’** to **D7**, which of the feedstock consignments, are mixed at the generating station? This includes mixing with fossil fuel.



### Tracking Sustainability Information

Questions **D9** and **D10** gather information on how you will will determine the quantity of each feedstock consignment, where feedstock consignments are mixed prior to the advanced conversion process.

1. Which type of mass balance system do you use to determine the quantity of each consignment used at the generating station? ***Choose an Item***
2. Explain how you will use a mass-balance system, including:
	* where in the supply chain and/or generating station the method will be used,
	* to which feedstock consignments it will apply,
	* how you will use the system to determine the quantity of each feedstock consignment used in a month.



**Section E - Fossil Fuel Use**

For more information about this section, please refer to our [guidance note](https://www.ofgem.gov.uk/publications-and-updates/advanced-conversion-technology-act-fuel-measurement-and-sampling-fms-questionnaire-and-guidance-note) on how to complete your ACT FMS questionnaire.

1. Is fossil fuel used at the generating station for any purpose? **🏱** Choose an item

If you have answered **‘Yes’** to question **E1**, then questions **E2** to **E4** should also be answered. If you have answered **‘No’**, go to **Section F**.

1. What fossil fuels are used at the generating station?



1. Does the fossil fuel result in the generation of any of the generating station’s gross output? Choose an item
2. If fossil fuel use does not result in generation, explain how you know this to be the case.



If fossil fuel will result in generation, questions **E5** to **E7** should be answered, otherwise go to **section F**.

1. How will you determine the quantity of fossil fuel used in a month which results in generation? State any equipment used and its accuracy (as a percentage or using units, for example +/-X% or Xkg).



1. How will you determine the gross calorific value (GCV) of fossil fuel used in a month which results in generation? Make reference to any standards used to sample and test the fossil fuel for GCV.



1. What monthly evidence will you send us to substantiate the quantity and GCV of fossil fuel reported on the R&CHP Register? Provide an example as part of your submission.



**Section F - Volume of advanced fuel used**

For more information about this section, please refer to our [guidance note](https://www.ofgem.gov.uk/publications-and-updates/advanced-conversion-technology-act-fuel-measurement-and-sampling-fms-questionnaire-and-guidance-note) on how to complete your ACT FMS questionnaire.

1. How will you measure the volume of the advanced fuel used in a month, which results in the generation? State the position that measurement is taken and the unit of measurement. Also provide details of any equipment used such as a flow meter, and confirm its accuracy.**🏱**



**Section G - Determining the GCV of the advanced fuel**

For more information about this section, please refer to our [guidance note](https://www.ofgem.gov.uk/publications-and-updates/advanced-conversion-technology-act-fuel-measurement-and-sampling-fms-questionnaire-and-guidance-note) on how to complete your ACT FMS questionnaire.

Questions **G1** to **G13** refer only to gaseous advanced fuel (syngas). If you are using a liquid advanced fuel (bio-oil) please answer **G14**.

1. State the method used for measuring the GCV of the syngas **🏱** Choose an item

If using an analyser, questions **G2** to **G6** should be answered.

1. State the model of analyser to be installed and its accuracy, for example +/-X%.



1. At what frequency is a gas sample extracted and sampled by the analyser?



1. Check the appropriate box to confirm that:

[ ]  the analyser is situated at the inlet of the generating station.

[ ]  you have emailed the staff member reviewing your FMS procedures a schematic diagram to show that the analyser is located at the inlet to the generating station.

1. Explain how you will measure the GCV at 25°C and 0.1 MPa[[1]](#footnote-1) or if the measurement is taken at other conditions how you will normalise the GCV to these conditions.



1. Will you use any alternative method of GCV sampling to verify the results from the analyser, such as bag samples? Provide details of the method, such as frequency of sampling, where the samples will be taken, how they will be extracted and what tests they will be subjected to.



If using bag samples supported with a back calculation instead of an analyser to determine the GCV, questions **G7** to **G13** should be answered.

**Bag Sampling**

1. What will be the total number of bag samples taken in a month, and at what intervals will samples be taken, for example weekly?



1. Who will extract the samples and how are they qualified to undertake sampling?



1. What vessel or container will be used to capture the gas samples and how will they be stored prior to laboratory analysis?



1. Where will the samples will be analysed for GCV, for example will samples be sent to a laboratory or analysed on site? If using a laboratory state any accreditations it holds. Also state what test(s) will be conducted on the samples to give a GCV, mentioning any relevant standards, and also how the results will be normalised to the following temperature and pressure conditions: 25°C and 0.1 MPa.



**Back Calculation**

1. What calculation will you use to to provide frequent GCV values for the advanced fuel? You should outline the formula that is used, the rationale for any assumptions, how the key input values are derived and the equipment used to measure them. For further information on this calculation, consult Chapter 3 of the [FMS guidance](https://www.ofgem.gov.uk/publications-and-updates/renewables-obligation-fuel-measurement-and-sampling-guidance-0).



1. At what frequency are GCV values determined by the back-calculation?



1. Check the appropriate box to confirm that:

[ ]  bag sampling is performed at the inlet of the generating station.

[ ]  you have emailed the staff member reviewing your FMS procedures a schematic that shows the location at which bag samples are extracted from in relation to the generating station.

For liquid advanced fuels question **G14** should be answered.

1. For liquid advanced fuels, outline the procedures to accurately determine the GCV of the advanced fuel on a monthly basis. Include information on the location, frequency of sampling, and any equipment used (including its accuracy).



For both liquid and gaseous advanced fuels, **G15** should be answered.

1. What monthly evidence you will send us to substantiate the average GCV of the advanced fuel reported on the R&CHP Register? Provide an example as part of your submission. **🏱**



**Section H – Determining the qualifying percentage of the advanced fuel**

For more information about this section, please refer to our [guidance note](https://www.ofgem.gov.uk/publications-and-updates/advanced-conversion-technology-act-fuel-measurement-and-sampling-fms-questionnaire-and-guidance-note) on how to complete your ACT FMS questionnaire.

1. Will the feedstock consignment(s) used to produce the advanced fuel contain any fossil derived contamination? **🏱** Choose an item

If you have answered **‘Yes’** to **H1**, questions **H2** to **H7** and sub sections **HA** to **HD** should be answered. If there is no fossil derived contamination present in your feedstock consignment(s) this is not required and you can progress directly to **Section I**. However, we will require a feedstock specification, contract or official letter from your supplier(s) to state that the feedstock(s) in question are 100 percent biomass by energy content and do not contain any fossil derived contamination.

1. What type of fossil derived contamination is present in your feedstock consignment(s)?



1. How will a representative sample of each feedstock consignment be extracted to test for fossil derived contamination? State the location from which the sample is taken and make reference to any apparatus utilised, the size of the sample extracted (in kg for example) and if sample extraction is in line with any recognised standards.



1. How regularly will you extract samples? If any composites are formed provide further information regarding the number of composites formed per month, how they are produced and their size including the units (such as kg or litres).



1. Where will the samples will be analysed for fossil derived contamination and what test(s) will be conducted on the sample to give a contamination percentage on an energy basis? Mention any relevant standards. If samples are sent to a laboratory, state any relevant accreditations it holds.



1. Where more than one sample / composite of the same feedstock consignment is analysed per month, how will the final contamination percentage figure be calculated from multiple sample results, for example an average taken?



1. What monthly evidence will you send us to substantiate the contamination percentage of the feedstock consignment(s)? Provide an example as part of your submission.



**Section H** is split into four subsections:

* **HA –** Determining the quantity of feedstock consignment(s) used to produce the advanced fuel,
* **HB –** Determining the GCV of the feedstock consignement(s) used to produce the advanced fuel,
* **HC –** Determining the quantity and GCV of char produced,
* **HD –** Calculating the contamination percentage figure of the advanced fuel.

These procedures all form part of the calculation to determine the fossil derived contamination percentage of the advanced fuel. If you have answered **‘Yes’** to **H1**, sections **HA** to **HD** should all be completed.

**Section HA – Determining the quantity of the feedstock consignment(s) used to produce the advanced fuel**

For more information about this section, please refer to our [guidance note](https://www.ofgem.gov.uk/publications-and-updates/advanced-conversion-technology-act-fuel-measurement-and-sampling-fms-questionnaire-and-guidance-note) on how to complete your ACT FMS questionnaire.

1. What approach will you use to measure the quantity of the feedstock consignment(s) used to produce the advanced fuel in a month? Refer to the location where the quantity is measured and any equipment utilised.



1. State the accuracy of any equipment used to measure the quantity of the feedstock consignment(s) (as a percentage or using units, for example +/-X% or Xkg). Make reference to any steps taken to ensuring ongoing accuracy, such as any calibration undertaken on a periodic basis (including relevant standards this would be conducted to).



1. If any feedstock consignment is carried over from one month to the next, how will the quantity of this will be accounted for and will any steps be taken to ensure this is accurate[[2]](#footnote-2)?



1. Tick this box to confirm that the quantity figure reflects the feedstock consignment(s) used in a month to within twelve hours either side of midnight on the last day of the month, with measurement undertaken at the same time each month [ ]
2. What monthly evidence will you send us to substantiate the quantity figure for each feedstock consignment used to produce the advanced fuel? Provide an example as part of your submission.



**Section HB – Determining the GCV of the feedstock consignment(s) used to produce the advanced fuel**

For more information about this section, please refer to our [guidance note](https://www.ofgem.gov.uk/publications-and-updates/advanced-conversion-technology-act-fuel-measurement-and-sampling-fms-questionnaire-and-guidance-note) on how to complete your ACT FMS questionnaire.

1. How will you extract a representative sample of the feedstock consignment(s) for GCV analysis? Provide information on sample extraction, regularity of sampling, formation of composites and make reference to any relevant standards utilised. If GCV analysis will be undertaken on the same sample(s) produced for contamination analysis (**questions** **H2** to **H7**), or on a sample produced using the same approach, simply state as such here.



1. Where will the samples be analysed for GCV, for example will samples be sent to a laboratory or analysed on site? If using a laboratory, state any relevant accreditations it holds. In addition, provide details on the test(s) which will be conducted on the sample to determine its GCV value, making reference to any relevant standards.



1. Where more than one sample / composite of the same feedstock consignment is analysed per month, how will the final figure be calculated from multiple sample results, for example an average taken?



1. What monthly evidence will you send us to substantiate the GCV figure for each feedstock consignment used to produce the advanced fuel? Provide an example as part of your submission.



**Section HC – Determining the quantity and GCV of Char produced**

For more information about this section, please refer to our [guidance note](https://www.ofgem.gov.uk/publications-and-updates/advanced-conversion-technology-act-fuel-measurement-and-sampling-fms-questionnaire-and-guidance-note) on how to complete your ACT FMS questionnaire.

1. How will you measure the quantity of char produced by the gasification/pyrolysis process in a month?



1. How will you determine the GCV of the char produced by the gasification/pyrolysis process in a month? This should include information on the extraction of a sample and how it is analysed.



1. What monthly evidence will you provide to substantiate the char quantity and GCV figures used in the contamination calculation to determine the overall contamination percentage of the advanced fuel? Provide an example as part of your submission.



1. Tick this box to confirm that you assume that all the energy content of the char is derived from 100 percent biomass within the contamination calculation [ ]

**Section H-D - Calculating the contamination percentage of the advanced fuel**

The final results obtained from the procedures in **section H** are used to calculate the contamination percentage which should be applied to the advanced fuel on the Register each month. The calculation for this is explained in the ‘Overall contamination percentage’ section of the [FMS guidance](https://www.ofgem.gov.uk/publications-and-updates/renewables-obligation-fuel-measurement-and-sampling-guidance-0).

[ ]  Tick this box to confirm that you will undertake the overall contamination percentage using the calculation outlined in Table 4 of the [FMS guidance](https://www.ofgem.gov.uk/publications-and-updates/renewables-obligation-fuel-measurement-and-sampling-guidance-0) document.

**Section I - Additional Information**

Use this space to include any other details you feel are relevant to your application. If you are using the answer space to expand on any of the answers provided above, make clear reference to the question you are answering by including the question number at the start of your response, for example **F1**





## Section J – Confirmation 🏱

I can confirm that all the information provided is correct, to the best of my knowledge and belief.

I am aware that I need to notify Ofgem where any of the procedures detailed in this document and/or the feedstock/fuels change.

Full name of authorised signatory of the generating station.



Thank you for completing the ACT FMS questionnaire. Please review your answers and ensure you have answered all compulsory questions (marked with **🏱** symbol) and a suitable level of detail has been provided.

A member of the Fuelling and Sustainability team will make contact with you in due course.

E-mail: fuellingandsustainability@ofgem.gov.uk / Telephone: 020 7901 7310

1. Megapascals. [↑](#footnote-ref-1)
2. For example the use of wall markers, provision of guidance for staff, ensuring the same staff undertake visual assessments for consistency, levelling of stock prior to assessment or other industry best practice. [↑](#footnote-ref-2)