

Applicant Guidance Note: Fuel Measurement and Sampling Explained



1. Introduction:

This Applicant Guidance Note provides an overview of Fuel Measurement and Sampling (FMS) in the context of the role it plays for fuelled generating stations within the schemes which Ofgem administers, such as the Renewables Obligation (RO), Climate Change Levy (CCL) Renewables Exemption and Renewable Energy Guarantees of Origin (REGO). The term fuelled station refers to any generating station which utilises fuels to generate electricity¹.

Reviewing this document prior to designing FMS procedures and submitting an FMS questionnaire (FMSQ) to us will provide you with important information on how the FMS review process is undertaken and assist you in completing the questionnaire document(s). In turn, this will minimise the number of queries raised on proposed procedures and therefore lead to approval in a shorter timescale.

This guidance note is aimed at fuelled generating stations which wish to apply for the renewable schemes we administer; it does not constitute legal advice and is not a substitute for our guidance documents.

2. Why FMS is required:

For fuelled stations, FMS procedures are required to determine the correct amount of renewable certificates e.g. ROCs, LECs and REGOs, to issue, and also facilitate reporting against the RO sustainability criteria. The procedures necessary for each generating station take account of the technology in question, fuels used and scheme which has been applied for.

Typical procedures agreed with generating stations include determining the mass or volume of fuels used, the energy content² of these fuels and, where relevant, the level of any fossil fuel or fossil derived contamination present within fuels. As certificate issue for these schemes is undertaken on a monthly basis the procedures agreed are also required to be undertaken each calendar month.

Procedures such as those above are required since certificates for these schemes can only be issued on electricity generated from renewable sources. The legislation which underpins these schemes requires us to calculate the proportion of generation which is eligible³ for certificate issue based on the relative energy content of the fuels used for generation. Therefore we require the mass / volume and energy content of each fuel.

¹ With the exception of generating stations which only use landfill gas or sewage gas. Where landfill gas and sewage gas are used alongside other fuels the station may be classed as a 'fuelled generating station'.

² On a Gross Calorific Value (GCV) basis

³ Termed 'Qualifying Percentage (QP)'

In addition, FMS procedures are also required for the following reasons:

- When electricity is generated from fuels that are awarded different levels of support e.g. ROC bands within the RO, in order to determine the level of support to apply to generation from each fuel.
- When a fuel contains fossil fuel or fossil derived contamination, to determine the percentage of the energy content of the fuel which is not eligible for certificate issue.
- To ensure the generating station is able to provide the necessary information to demonstrate compliance with, or report against the RO sustainability criteria.

Fuelling data and certificate issue:

The output of agreed FMS procedures are the fuelling data (see Fig1), submitted on the Renewables & CHP (R&CHP) Register⁴ alongside electrical data, on which certificate issue is calculated. As we require all data on which we issue certificates to be accurate and reliable, during the FMS review process we work closely with operators to ensure the procedures agreed are fit for purpose and capable of providing accurate information.

Fuelling data are usually accompanied by evidence to verify the figures provided as the outcome of the agreed procedures being undertaken e.g. a laboratory report detailing the GCV of a representative fuel sample, or a record of the total kilograms (kg) of biomass combusted in a month from a beltweigher.

3. Prior to submitting FMS procedures:

We have produced a wide range of documentation to assist fuelled stations to devise suitable FMS procedures for certificate issue. Published documents relating to FMS can be obtained from the 'Fuelled Stations and FMS' page of our website.

FMS procedures are proposed to us in the form of a FMSQ, further information on the FMS documents available and advice on how to complete them is available in section four.

FMS Guidance:

Prior to completing the required FMSQ(s), it is essential to read the 'Renewables Obligation: Fuel measurement and sampling guidance' document. This contains key information relating to the eligibility of fuels and FMS procedures for different technologies and types of fuels. It also includes information on submitting monthly fuelled data for certificate issue.

This guidance document will also assist you in identifying the correct FMSQ to submit. In addition, the guidance document also includes detailed appendices which provide useful information on designing suitable FMS procedures. The FMS guidance document is also available via the 'Fuelled Stations and FMS' page.

Specific guidance documents are also available from this page for:

- Biodiesel and Fossil Derived Bioliqum fuels.
- A specific approach to measuring fossil derived contamination in waste wood.

Fuel Measurements

Fuel Reference	Quantity	Quantity Unit of Measure	Gross Cal Value	Gross Cal Unit of Measure	Heat Contribution Value	Heat Contribution %	Contamination %
B-PO-1	3000	Kg	18	MJ/Kg	0.00000000000000	0	4

Fig 1. Selected fuel measurement data fields on the Renewables & CHP Register

⁴ Ofgem's IT system used for submitting applications and monthly certificate claims.

Having consulted the available guidance documentation should you still have any remaining questions about which FMSQ to complete or suitable procedures for your generating station you are welcome to call the Fuelling and Sustainability team to discuss any specific queries not covered by the available guidance. Information on contacting us is available in section eight.

Point of contact for FMS procedures:

When reviewing FMSQ documentation, we typically deal with one nominated individual at the generating station during the review process. The individual nominated by the generating station responsible for the development of FMS procedures must be named on your account on the R&CHP Register in order for us to communicate with them regarding the review of the FMS. Guidance on how to do this is available in the 'Register Help Sheet'.

When to submit a FMSQ:

We cannot review any FMS documentation prior to an accreditation application being submitted. The relevant FMSQ documentation should therefore be submitted alongside an application for either accreditation or preliminary accreditation.

4. FMS Questionnaires:

As mentioned previously FMS procedures for a generating station are documented within a FMSQ. The technology and fuels utilised at the generating station will determine which FMSQ(s) should be completed.

The available questionnaires are now listed:

- **Standard RO FMS questionnaire:** Applicable to most solid, liquid and gaseous biomass stations, applying for the RO, which do not fall under one of the following categories.
 - **FMS questionnaire gasification and pyrolysis:** Applicable only to operators using gasification or pyrolysis technologies at their station.
 - **Anaerobic digestion (AD) feedstocks template:** A short declaration to be completed by operators using only biogas, produced by means of anaerobic digestion, to generate electricity ⁵.
 - **Confirmation of 100 per cent uncontaminated biomass:** A shorter version of the standard RO FMS questionnaire, for use by stations using only biomass uncontaminated by fossil fuel or fossil derived materials, to generate electricity. For this questionnaire to be applicable all fuels used must fall under the same ROC banding and any fossil fuel use must not lead to the generation of electricity.
 - **Carbon-14 questionnaire:** To be completed by operators wishing to use Carbon-14 radiocarbon analysis to determine the biogenic content of their fuel(s). This document should be completed alongside the relevant RO or CCL FMS questionnaire.
 - **BIOMA questionnaire:** To be completed by operators proposing to use the BIOMA method to determine the biogenic content of their fuel(s). This document should be completed alongside the relevant RO or CCL FMS questionnaire.
- All of these questionnaires are available from the 'Fuelled Stations and FMS' page of the Ofgem website.
- There are also three dedicated questionnaires for CCL only stations:
- **Standard Climate Change fuel measurement and sampling questionnaire:** This is similar to the standard RO FMS questionnaire but applicable to operators applying only for the CCL scheme.
 - **Climate Change Levy waste questionnaire:** This questionnaire is especially for generating stations that use waste fuels and propose annual procedures or deeming of biogenic content, that wish to apply for the CCL scheme.
 - **CCL – Confirmation of 100% uncontaminated biomass questionnaire:** To be completed by operators wishing to apply for the CCL scheme, who will only be using 100 per cent biomass by energy content fuel(s), and where no fossil fuel used will result in generation of electricity.

⁵ Where sewage is added to the digester or fossil fuels are used which result in the generation of electricity the Standard RO FMS questionnaire will need to be submitted in conjunction with this template.

These questionnaires are available from the [CCL Fuelled Stations and FMS page](#).

If you are not sure which are the relevant FMSQ documents to complete please make contact with the Fuelling and Sustainability team and we will be happy to assist you. Failing to complete the correct questionnaire will result in a longer time period to reach FMS approval.

Preliminary Applications:

Generating stations applying for preliminary accreditation are still required to complete the applicable FMSQ(s). For preliminary applications the answers provided within the questionnaire(s) should still clearly outline proposed procedures. However, certain questions may be answered with less detail if this is not available at the time of completion. Further detail can then be provided by the applicant when converting from preliminary to full accreditation.

Guidance for completing FMSQ documents:

The following guidance will assist you to complete FMSQ documentation in the correct manner and result in less queries being raised on your application and a shorter review period.

It is essential we have a concise record of a generating station's FMS procedures and as such questionnaire(s) must be completed fully and approved by us as part of the application process for the schemes we administer. This information is required to ensure that the fuelled data on which certificates are issued are accurate and reliable.

You must provide a suitable level of detail when answering questions in order to clearly outline the FMS procedures to be used. This will aid us in the review of the proposal and reduce unnecessary delays in the approval process.

The size of the text box available for a response to each question indicates the length of reply expected; please try and fit your responses within the space provided. In certain questionnaires additional answer space has been provided at the end, should it be required, in order to provide information relevant to your FMS procedures.

Please also note that you should only specify procedures for fuels used which will lead to the generation of electricity ⁶.

Certain questions are compulsory for all generating stations. Compulsory questions must be answered and are marked with a symbol. Some questions within the FMSQs are free text and a written answer is expected. Others are restricted and the applicant should select from either a drop down list, option⁷ button or provide confirmation through checking a tick box. Not all questions will be relevant to all generating stations, as such you are welcome to state 'not applicable (N/A)' where this is the case.

Chapter 3 of the 'Renewables Obligation: Fuel measurement and sampling guidance' document provides further information on FMS procedures for different fuels and technologies.

Use of Standards:

While it is not compulsory, where your procedures are based on recognised standards e.g. from bodies such as CEN or ISO⁸, it provides us with additional comfort that best practice is applied. When stating that procedures are based on standards please include the name, reference and relevant part(s) of the standard which will be followed. The procedures proposed will still need to be clearly outlined in the questionnaire.

5. Supporting documentation:

There may be cases when providing supporting documents in addition to your FMSQ can provide additional clarification on the procedures proposed.

Where we consider that supplementary documentation would provide extra clarification on your procedures and assist the FMS review process we will make a request for this. We do not require supplementary information which is not relevant to your FMS procedures. Please also note that supporting documents cannot be provided in place of the relevant FMSQ.

⁶ In some cases you may be required to demonstrate that certain fuels eg fossil fuels used for a permitted ancillary purpose within the RO Order such as the ignition of fuels of low or variable calorific value do not result in the generation of electricity

⁷ Also called 'Radio' button

⁸ The European Committee for Standardisation and International Organization for Standardization

Some examples of relevant supporting information are:

- Technical specifications for equipment e.g. gas analysers, weighing devices.
- A process flow diagram to outline the location of key measurement and sampling locations at the generating station.
- Procedure sheets / instructions for staff e.g. to outline how a visual estimation of stock is undertaken or a sample extracted.
- Example Excel spreadsheets to demonstrate the format in which monthly data will be provided to us in support of ROC claims⁹.

We may also request specific supplementary documentation where necessary to aid the understanding of a station's procedures. All documents submitted should be concise, in English and relevant to the FMS procedures proposed.

Fuel supplier documentation for uncontaminated biomass:

Where biomass fuels are used which are not contaminated with fossil fuel and fossil derived materials, no FMS procedures are required to determine contamination¹⁰. However, in this situation documentary evidence in the form of a suitably worded contract or official letter from the supplier should be provided to us to state that the fuel is free from fossil fuel or fossil derived contamination. An example of suitable wording for this is provided in the appendices to the 'Renewables Obligation: Fuel measurement and sampling guidance' document.

6. Sustainability and FMS:

While developing FMS procedures you should take into consideration the need to report greenhouse gas (GHG) and land use information (the 'sustainability criteria') as outlined in the Renewables Obligation Order, for renewable fuels used. This reporting applies to all generating stations using bioliquid fuels, and all generating stations using solid or gaseous biomass with a declared net capacity (DNC) of greater than 50 kilowatts (kW). For more information on reporting against the sustainability criteria for your fuel(s), and implications for ROC issue of non-compliance with the criteria, please visit the 'Biomass Sustainability' page of the Ofgem website. This page also has guidance documents available for download on the sustainability criteria for both solid and gaseous biomass and bioliquid fuels.

7. The FMS Review Process:

The first stage in the FMS review process is for the generating station to submit their proposed procedures for review. FMSQ documents should only be submitted when fit for purpose FMS procedures, capable of delivering the required accurate and reliable fuel data for certificate issue are developed and clearly documented. Where an individual document is submitted this should be uploaded to the application on the R & CHP Register. Where multiple FMSQ documents are submitted these should be e-mailed to: renewable@ofgem.gov.uk with name of the generating station in the subject line.

Once a FMSQ is submitted to us, either alongside an application for full or preliminary accreditation or where proposing a change to agreed procedures, we will need to review the proposed procedures for suitability. Each submission of FMS procedures is assigned a dedicated reviewer within the Fuelling and Sustainability team. Once submitted we will consider the status of the FMS to be *in review* (with Ofgem).

⁹ For gasification and pyrolysis stations agreement of these with Ofgem is required during the FMS review process.

¹⁰ In terms of contribution to energy content.

Review and comments:

The FMS reviewer will then undertake a full review of the FMSQ(s) and any relevant supporting documentation. After this review it is common for comments to be raised by e-mail regarding the documentation submitted. Queries can be raised for a wide variety of reasons, including:

- Requesting further detail / explanation on proposed procedures.
- To highlight any areas of concern as regards the ability of the procedures to produce accurate and reliable results.
- To suggest the consideration of alternative procedures or alterations where relevant.
- To make a request for additional supporting documentation.

All applications are reviewed on a case by case basis taking account of the specific circumstances of the generating station and fuels in question.

Once these comments are raised and sent to the generating station representative we consider the status of the review to be *with applicant* (with the applicant for update). While it is *with applicant* it will not be subject to further review by us. At this point it is the responsibility of the nominated representative of the generating station in charge of developing FMS procedures to address the comments raised and update the FMS documentation (both questionnaires and relevant supporting documentation as required).

Ensure that all comments raised are addressed in full prior to re-submitting the updated FMS documentation for review by email; once re-submitted and back *in review* the dedicated reviewer will assess the updated documentation

for suitability. It is normal that during a FMS review there may be several rounds of comments raised and subsequently addressed before agreement can be reached.

Agreement:

Agreement will only be given once we have confidence that the procedures proposed will provide accurate and reliable information for the issue of certificates. A generating station is notified of FMS approval by e-mail. This e-mail will also include instructions for setting up fuels on the R&CHP register,¹¹ for data submissions and provide confirmation of the monthly fuelling data and evidence required. It is important to follow the instructions outlined in the FMS approval email to minimise the potential for unnecessary delay in the issue of certificates.

For fuelled generating stations approval of the required FMS documentation is necessary prior to any formal accreditation of the generating station for either accreditation or preliminary accreditation is granted.

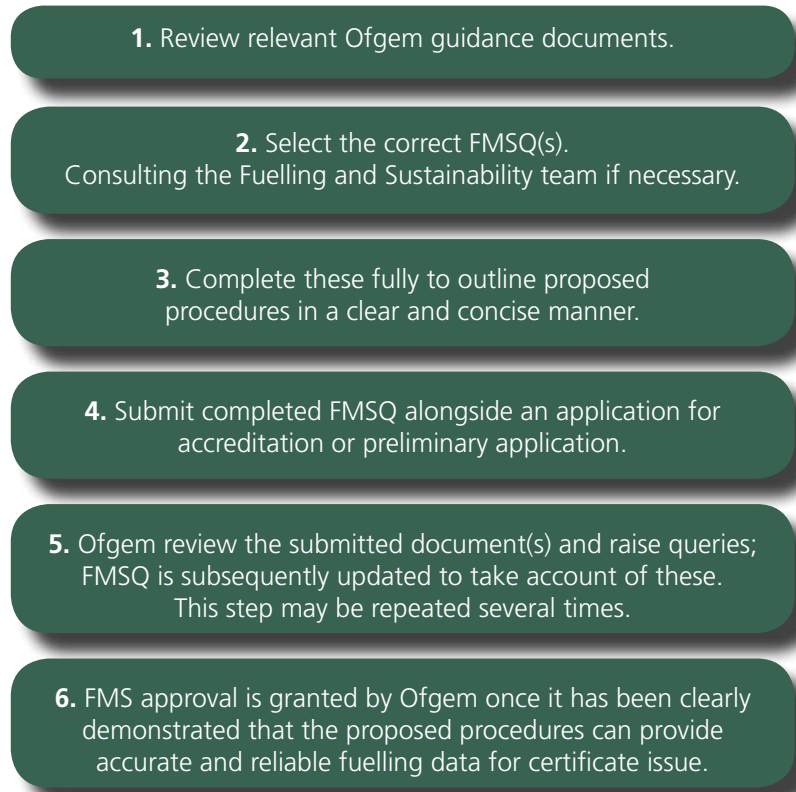
Timescales:

There are no set timescales to conclude the FMS review process. While we turn around reviews promptly when a FMS is *in review*, the time a FMS is *with applicant* awaiting comments to be addressed by the generating station can vary. In order to ensure agreement is reached as swiftly as possible it is important to ensure that the first submission of FMS documentation is of high quality and during the review process comments are addressed promptly and comprehensively.

The figure on the following page provides a high level overview of the end to end process from FMS procedure development to approval from the perspective of the applicant:

¹¹ In some cases a generating station may need to submit data before FMS procedures are approved. In this situation fuels can be set up on the R&CHP register prior to approval. However, they will not be approved by us for ROC issue until such point as the FMS procedures have been approved.

Fig 2. Overview of the FMS development and review process



8. Communicating with Ofgem regarding FMS:

After consulting the relevant guidance materials should you have any further queries regarding FMS you are welcome to contact us to discuss further using the following contact details:

- E-mail: renewable@ofgem.gov.uk
- Phone: 020 7901 7310 (Mon-Fri 10am to 4pm¹²)

Once the review of proposed FMS procedures has begun the best point of contact for any queries regarding the FMS review process will be the reviewer of your application. You will be provided with their contact details once they have conducted an initial review and queries have been raised, and will be able to contact them directly.

Any future FMS submission for a different generating station should be submitted via the R&CHP register or via the e-mail address above where there are multiple documents, at the time of making an accreditation or preliminary accreditation application. These should not be sent directly to the reviewer of any previous FMSQ for a different application.

We use the 'Fuelled Stations and FMS' page of our website to communicate developments in the FMS field when required. In addition, to keep up to date with developments with regard to fuelling and sustainability you can request to be added to our stakeholder mailing list; to do so e-mail fuellingandsustainability@ofgem.gov.uk. Please include your name, email address, company / organisation (if relevant) and reason for interest, in the e-mail.

¹² Outside of these hours or during busy periods you are welcome to leave a voicemail clearly outlining your query and contact details.

Keeping FMS procedures up to date:

It is the responsibility of the generating station to ensure that their FMS procedures are up to date at all times. Therefore if you propose to change fuels, FMS procedures or equipment¹³ on site we should be notified in advance and, where applicable, updated FMS documentation will need to be submitted for review.

Updated FMS procedures should be sent by e-mail to: renewable@ofgem.gov.uk, with 'Updated FMS' and the name of the generating station in the subject line.

All generating stations accredited under of the schemes we administer may be subject to audit. Therefore it is essential that the documented procedures we have on file match those carried out on site.

9. Checklist:

The following checklist can be used to ensure that the FMS review process can proceed smoothly:

Prior to submitting FMS procedures for review:

- The relevant sections of the FMS guidance document have been reviewed.
- Any other relevant guidance available on the 'Fuelled Stations and FMS' page of the website has been consulted.
- The correct FMSQ document(s) have been identified ¹⁴ .
- A representative from the generating station has been appointed to complete FMS documentation and represent the generating station during the review process.
- The representative of the generating station responsible for liaising with us during the FMS review process has been named as a user on the R&CHP register account.
- FMSQ completed to clearly document proposed procedures and any relevant supporting documentation compiled.

During the review process:

- FMS documentation is submitted for review alongside an application for accreditation or preliminary application.
- All comments as raised during review are fully addressed, and the FMS documentation updated accordingly prior to each re-submission.

After FMS approval

- Relevant fuel(s) are set up on the R&CHP register for use in data submissions.
- FMS procedures are carried out as per agreement with Ofgem.
- Monthly fuelling data are submitted for certificate issue alongside agreed evidence.
- We are notified prior to any change in fuels or FMS procedures or equipment used for FMS procedures, with FMS documentation updated accordingly and submitted to us for approval¹⁵ .

¹³ Equipment utilised for the purposes of fuel measurement and sampling.

¹⁴ If you are not clear as to which document(s) apply please make contact with us

¹⁵ If FMS procedures are changed with little or no notice given to us then certificate issue will be suspended until such point as these procedures have been agreed i.e it has been demonstrated the updated procedures will continue to provide accurate and reliable results