

Quality Assurance for Combined Heat & Power Form F4 (S) – Self-Assessment for Existing Schemes

This simplified form only applies to Reciprocating Engine based CHP Schemes that:

- are less than 2MWe CHP_{TPC} in size
- use only a single conventional fuel e.g. natural gas, diesel
- only include a single engine, together with associated heat recovery equipment, within the Scheme boundary
- do not include heat only boilers

In all other circumstances the full version of form F4 must be submitted for the Self-Assessment of Existing CHP Schemes.

In addition, where Schemes do not meet the Power Efficiency Threshold Criteria for Good Quality CHP the full version of form F4 must be submitted in order to attain certification.

This form is intended for applicants with one or more Schemes on the same site that have a total on-site capacity not exceeding 2MWe, with a separate form completed for each of these Schemes. However, if the CHP Schemes are joined through a common heat header (i.e. should be treated as a single Scheme) then form F4(S) is not applicable and form F4 should be used.

NOTES:

- This Form will enable the Responsible Person to undertake a Self-Assessment of the Quality of the CHP Scheme described in Form F2(S).
- You need to resubmit this Form annually (January of each year).
- Form F2(S) needs to be kept up-to-date and must relate to the CHP Scheme applying for Certification in this Form.
- The most up to date version of the CHPQA Standard and Guidance Notes (GN) must be used, these can be found on <https://www.gov.uk/guidance/combined-heat-power-quality-assurance-programme>
- GN4(S) has been written to help you complete this Form.
- Information provided on this Form will be stored electronically and treated in the strictest confidence. Only the government or its agents will use it for the purpose of the CHPQA programme, including collection and collation of national statistics, and the administration and development of government schemes, including the Renewables Obligation, the Renewable Heat Incentive and Contracts for Difference.
- The Department for Business, Energy & Industrial Strategy maintains a publicly available database of CHP Schemes (<https://www.gov.uk/guidance/combined-heat-and-power>). To help inform regulatory and policy developments in support of CHP, this database should be as complete as possible. If you are willing for the CHPQA programme to provide this information, please complete and sign the addendum and return it with this form.

This Form should be completed and returned to *The Administrator, CHPQA programme, The Gemini Building, Fermi Avenue, Didcot OX11 0QR*

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CONTENT OF FORM F4(S):

- Part 1 Scheme Identification and Declaration ➤ See GN4 (S).7
- Part 2 Scheme Energy Inputs and Outputs ➤ See GN14, 15 & 16
- Part 3 Criterion 1: Power Efficiency ➤ See GN10, 24 & 25
- Part 4 Quality Index ➤ See GN10, 24 & 25
- Part 5 Calculation of CHP_{QPO}
- Part 6 Secretary of State (CHP) Exemption Certificate Application ➤ See GN41

GUIDELINES:

- All calculations in Part 3 should be completed to 2 decimal places.

Part 1 Scheme Identification and Declaration

1. SCHEME IDENTIFICATION

Site Name	Site ref.
Company Name	Scheme ref.*

* The Programme Administrator will provide you with this Scheme ref. once Form F2(S) is processed.

2. DECLARATION

- I confirm that I am the nominated Responsible Person for the operation of the Scheme described in Form F2(S).
- I confirm that I have supplied all necessary information, as required by the Administrator under the CHPQA programme, based on the CHP Scheme described in Form F2(S) and that all information provided in this form is correct and conforms to the requirements set out in the CHPQA Standard.
- I undertake to inform the CHPQA programme should any of the above details change.

Signature _____ Date _____

Name _____ (block capitals)

Position _____ (block capitals)

The CHPQA programme is carried out on behalf of the Department for Business, Energy & Industrial Strategy, the Scottish and Welsh Governments, and the Northern Ireland Department for the Economy.

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Part 2 Scheme Energy Inputs and Outputs

3. PERIOD OF OPERATION FOR SELF-ASSESSMENT

- The energy inputs and outputs declared in Sections 4, 5 and 6 are based on _____ hours of operation of the CHP Scheme over a 12 month period.

4. ENERGY INPUTS

- Record below the total fuel inputs to the CHP Scheme.
- All fuel energy inputs should be based on **gross calorific value** (higher calorific value) i.e. as shown on gas bills.
- For certain categories of Scheme the Total Fuel Input may be estimated by dividing the Total Power Output by the Power Efficiency obtained from the manufacturer. For further details of Schemes eligible to follow this process see [Part 2 Section 4 of guidance note GN4\(S\)](#).

Tag & Calc. No.	M2(FcQ)
Fuel Type	
Year of Self Assessment:	
CHP Total Fuel Input (CHP _{TFI})	(MWh)

5. POWER OUTPUTS (GENERATED)

- Record the power generated by the CHP Scheme (power is gross generated i.e. measured at the generator terminals). See [Part 2 Section 4 of guidance note GN4\(S\)](#).
- Each meter reading should be identified by meter tag number given on Form F2(S). See [GN12.3](#)

Tag or Calc. No.	M3(EQ)
Year of Self Assessment:	
CHP Total Power Output (CHP _{TPO})	(MWh)

6. USEFUL HEAT OUTPUTS

See [Part 2 Section 4 of guidance note GN4\(S\)](#).

- For CHP Schemes with CHP_{TPC} < 2MW_e with no heat rejection facility complete Section 6a only.
- For CHP Schemes with CHP_{TPC} < 2MW_e with heat rejection facility complete Section 6b only.

6a. Heat Declaration for CHP_{TPC} < 2MW_e with No Heat Rejection Facility

Statement.

I declare that:

- All heat that is recovered from the CHP Scheme (down to exhaust gas discharge temperatures that are practically achievable and from engine cooling systems) is distributed to site.
- No exhaust gases by-pass the heat exchanger(s) in normal operation and no heat from the CHP Scheme is rejected (dumped to atmosphere) on site.

The total heat outputs supplied to the site from the CHP Scheme should be estimated for the 12 months Self-Assessment period by multiplying the design heat-to-power ratio from Form F2(S) by the Total Power Output. This equates to MWh* (this figure is known as CHP Qualifying Heat Output (CHP_{QHO})).

* Use metered values if available.

➤ Now proceed to Part 3

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6b. Heat Output for $\text{CHP}_{\text{TPC}} < 2\text{MW}_e$ with Heat Rejection Facility

- Record the useful heat generated by the CHP Scheme See [Part 2 Section 4 of guidance note GN4\(S\)](#).
- Each meter reading should be identified by meter tag number given on Form F2(S).

Tag or Calc. No.	M4(EQ)
Year of Self Assessment:	
CHP Total Useful Heat Output (CHP_{QHO})*	(MWh)

*Based on actual heat monitoring figures.

➤ Now proceed to Part 3

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Part 3 Criteria 1: Power Efficiency

7. CHP SCHEME EFFICIENCIES

See GN24.2 and Part 3 of GN04s

Calculate the Heat and Power Efficiency for the CHP Scheme, using energies declared in Part 2. For those Schemes eligible to estimate their Total Fuel Input in Section 4, the Power Efficiency may simply be entered in the appropriate part of the box below.

[report efficiency % to 2 decimal places]

Power Efficiency, $\eta_{\text{power}} = 100 \times \frac{\text{CHP}_{\text{TPO}}}{\text{CHP}_{\text{TFI}}}$
= 100 x _____ / _____ = * _____ %

Heat Efficiency, $\eta_{\text{heat}} = 100 \times \frac{\text{CHP}_{\text{QHO}}}{\text{CHP}_{\text{TFI}}}$
= 100 x _____ / _____ = _____ %

* Efficiencies are commonly quoted in terms of % figures, as calculated above, but for all of the calculations that follow, efficiencies must be expressed as decimal fractions, e.g. 40.25% = 0.4025

8. THRESHOLD POWER EFFICIENCY

See GN24.7 & 24.8

A Scheme must meet or exceed the relevant Threshold Power Efficiency for all fuel input to qualify as inputs to Good Quality CHP.

The Power Efficiency Threshold for your Scheme is 20 %

Did your Scheme achieve the Power Efficiency Threshold? (tick box) YES NO

If YES then ➤ Go To Section 9

If NO then ➤ The Scheme does not meet the Threshold Power Efficiency. To achieve certification, the Full Form F4 must be completed.

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Part 4 Quality Index

9. QUALITY INDEX

See GN24.9 & 24.11

For Schemes that have been certified previously and prior to 1 January 2016 on the basis of an F3 submission or prior to 1 January 2017 on the basis of an F4 submission, the QI formulae in Table 1 of Issue 5 of the CHPQA Standard will continue to be used for certification in 2017.

For those Schemes that have not previously been certified under CHPQA or were certified for the first time between 1 January and 31 December 2016 on the basis of an F3 submission, the QI formulae in Table 1 of Issue 6 of the CHPQA Standard must be used for certification in 2017.

Please refer to CHPQA Standard (Issue 6) if further clarification is required.

$$QI = (X \times \eta_{power}) + (Y \times \eta_{heat}) = (\quad \times \quad) + (\quad \times \quad)$$

Quality Index = _____

[Report QI to 2 decimal places]

CHP Schemes (including Schemes with TPC < 2MW_e) must achieve the relevant QI Threshold to be considered 'Good Quality' CHP.

What is the QI Threshold for your Scheme? <u>(either 95 for Schemes in Initial Operation or 100 for Schemes in Long Term Annual Operation)</u>		
Did your Scheme achieve the QI Threshold? (tick box)	YES <input type="checkbox"/>	NO <input type="checkbox"/>

Part 5 Calculation of CHP_{QPO}

CHP_{QPO} is the proportion of the power generated that qualifies as an output from 'Good Quality' CHP. These calculations will be undertaken by the CHPQA Administrator on your behalf and the corrected CHP_{QPO} and CHP_{QPC} given on your CHPQA Certificate.

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Part 6 Secretary of State (CHP) Exemption Certificate Application

This section must be completed in order to obtain your Secretary of State (CHP) Exemption Certificate.

Please choose one of the options below (tick box).

1. Please maintain the validity of the Secretary of State (CHP) Exemption Certificate for this CHP Scheme.
2. Please send me the Secretary of State (CHP) Exemption Certificate for this CHP Scheme.
3. Please vary the Secretary of State (CHP) Exemption Certificate for this CHP Scheme.
 - It was previously certified as being partly exempt and now subsequently satisfies the conditions for full exemption, or
 - Its efficiency percentage now falls below or rises above the prescribed threshold efficiency percentage.
4. A Secretary of State (CHP) Exemption Certificate is not required

Your SoS certificate will be raised on the CHPQA system and will then be available via your Responsible Person's system login, and located under the 'Certificates' tab.

To complete the Self-Assessment, go to Section 2 (Page 2) and sign the declaration.

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ADDENDUM – PERMISSION TO PROVIDE DATA FOR PUBLICATION

Site Name	Site ref.
Company Name	Scheme ref.

The Department for Business, Energy & Industrial Strategy (BEIS) maintains a public domain database of CHP Schemes (<https://www.gov.uk/guidance/combined-heat-and-power>). Are you willing for the CHPQA programme to provide the following data from the F2 or F2(s) and F1 forms to BEIS to be placed on this database **and thus freely available to the public?**

Please tick this box if you agree for the data to be provided to BEIS YES

The data for BEIS would be

- Site name and address (Form F1)
- Company name and address (Form F1)
- Economic Sector (Form F2 or F2(s) 2.1)
- Status of Scheme (Form F2 or F2(s) 3.1)
- Manufacturer, model/type and year commissioned for prime mover(s) (Form F2 or F2(s) 4)
- CHP Total Power Capacity, Max Heat and Total Power Capacity under Max Heat conditions (Form F2 or F2(s), 6.1, 6.2, 6.3)

I confirm that I am the nominated Responsible Person for the operation of the Scheme

Signature _____

Date _____

Name _____

(block capitals)