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Quality Assurance for Combined Heat & Power

Form F3(S) – Self Assessment of Proposed New CHP Schemes

This simplified form is only to be used for proposed new Reciprocating Engine based CHP Schemes that:

- **will be less than 2MWe CHP_{TPC} in size**
- **will use a single conventional fuel e.g. natural gas, diesel**
- **will only include a single engine, together with associated heat recovery equipment, within the Scheme boundary**
- **will not include heat only boilers**
- **will meet the Power and QI Threshold Criteria for Good Quality CHP based on design data.**

In all other circumstances, the full version of Form F3 must be used for the Self-Assessment of Proposed New CHP Schemes.

This form is intended for applicants that will have one or more Schemes on the same site with 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 F3(S) is not applicable and form F3 should be used.

NOTES:

- This Form F3(S) is to be used for the Self-Assessment of proposed new CHP Schemes based on the final Scheme design and anticipated operating conditions
- Forms F2(S) and F4(S) must be submitted for existing Schemes in Initial or Annual Operation
- Guidance Note GN3(S) has been written to help applicants complete this Form
- The most up-to-date version of the CHPQA Standard and Guidance Notes can be found on the CHPQA web site (https://www.gov.uk/guidance/combined-heat-power-quality-assurance-programme)
- CHPQA Certificates are valid until 31 December of the year of issue.
- 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.

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

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Part 1: Scheme Identification & Site Information

1. SCHEME IDENTIFICATION

Site Name:	Site ref.*
Company Name:	Scheme ref. [Office use only]

* Provided by CHPQA Administrator following completion and submission of Form F1

2. BASIC INFORMATION

Sector (e.g. Public Administration - Health, see GN 12.1):	
Does this site have existing CHP Scheme(s)	YES ☐ NO ☐
If there is an existing CHP Scheme(s) on site, has that Scheme(s) been Registered with the CHPQA programme? If YES What is the Scheme reference number(s)?	YES ☐ NO ☐
Is this Scheme a replacement (including upgrades) of an existing Scheme or completely new?	Upgrade ☐ New ☐
Provide a general description of the proposed Scheme (see GN3(S))	
What is the state of development of the proposed Scheme? (e.g. specification/tendering/procurement/installation/commissioning)	
When do you expect to: (a) start installation (b) start commissioning (c) start Initial Operation (if known, see GN10.17)	State month and year for each phase:

3. SITE/CONSUMER ENERGY DEMANDS

Heat/Steam Demand: Annual…… kWh/year Average: …….. kW_{th} *
Electricity Demand: Annual…… kWh/year Average…… kW_e

* In the space below (or on a separate, numbered attachment) show the calculation of heat demands in kW from the basic data (e.g. steam flow, pressure, temperature and specific enthalpy)

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Part 2: Description of Scheme

4. SCHEME EQUIPMENT DETAILS

Use this table to provide details of the CHP unit upon which the CHP Scheme is based.
The CHPQA CHP Unit List often contains this information, see:
https://www.gov.uk/guidance/chpqa-guidance-notes
Applicants must attach a Scheme Energy Flow Diagram to the application (see GN3(S))

Manufacturer	Model/ Type	Engine Type	Total Power Capacity - equivalent to maximum instantaneous power output (kW_e)	Qualifying Heat Capacity – equivalent to maximum instantaneous heat output (kW)

5. SCHEME MONITORING ARRANGEMENTS

- Use this table to list all proposed metering stations (including the main gas meter) for your Scheme inputs and outputs. It is essential that you provide the Meter Point Reference (MPR) Number for the main Gas Networks meter. See GN3(S) for further guidance.

Tag Number	MPR Number	Serial Number	Year Installed	Model/ Type	Metered Service	Metered Outputs	
						Range	Units
M1(FcQ)					**Gas (Main Gas Supply)**		
M2(FcQ)	**N/A**				**Gas (CHP)**		
M3(EQ)	**N/A**				**Electricity (CHP)**		
M4(H)	**N/A**				**Heat**		

6. ENERGY INPUTS

- Record below the estimated CHP Total Fuel Input to the CHP Scheme for the first year of operation (the period from the start of Initial Operation to the end of the first calendar year).
- All fuel energy inputs should be based on gross calorific value (higher calorific value) i.e. as shown on gas bills.
- For guidance on different fuel types see GN 14

Fuel Type	
Estimated CHP Total Fuel Input (CHP_{TFI})	(MWh)

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7. POWER OUTPUTS

- Record below the estimated CHP Total Power Output from the CHP Scheme for the first year of operation (the period from the start of Initial Operation to the end of the first calendar year).
- Power is gross generated i.e. measured at the generator terminals (see GN 15 for further details)

Estimated CHP Total Power Output (CHP_{TPO})	(MWh)

8. USEFUL HEAT OUTPUTS

See GN16

- For CHP Schemes with no heat rejection facility completes Section 8a only.
- For CHP Schemes with heat rejection facility completes Section 8b only.

8a. Heat Declaration for CHP Scheme 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 used on site.*
- *No exhaust gases by-pass the heat exchanger(s) in normal operation and no heat from the CHP Scheme is rejected (dumped) on site.*

The total heat outputs supplied to the site from the CHP Scheme should be estimated for the first year of operation (the period from Initial Operation to the end of the first calendar year) *by multiplying the design heat-to-power ratio by the CHP Total Power Output. This equates to ……. MWh* ***(this figure is known as CHP Qualifying Heat Output (CHP_{QHO})).***

- **Now proceed to Part 3**

8b. Heat Declaration for CHP Scheme with Heat Rejection Facility

Statement.

The heat demands of the site based on design/ estimates/measurements are approximately,
…… kW applicable for …….. h/year in the Winter (Heating Season) months
…….. kW applicable for …….. h/year in the Summer months.

The heat output of the CHP Scheme at full load will be …… kW in the form of hot water
…… kW in the form of steam

- *Heat that is recovered from the CHP Scheme (down to exhaust gas discharge temperatures that are practically achievable and from engine cooling systems) will be, whenever possible, used on site.*
- *When the CHP heat available exceeds the site demand: (delete as necessary)*
  Hot exhaust gases by-pass the heat exchanger(s)
  Excess heat recovered from the CHP Scheme is rejected (dumped)

It is estimated that the maximum heat output from the CHP Scheme will be utilised on site for …… % of the CHP operating hours.

It is estimated that the total heat output likely to be supplied to the site from the CHP Scheme in the first year of operation (the period from Initial Operation to the end of the first calendar year) *-will be …… MWh* ***(this figure is known as CHP_{QHO})****.*

- **Now proceed to Part 3**

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Part 3: Heat and Power Efficiencies

9. CHP SCHEME EFFICIENCIES

See GN24.2

- Calculate the Heat and Power Efficiencies for the CHP Scheme, using energies declared in sections 5, 6 and 7.

Power Efficiency, η_{POWER}	= 100 x	CHP_{TPO}	/	CHP_{TFI}		
	= 100 x _____		/ _____		= _____	**% ***
Heat Efficiency, η_{heat}	= 100 x	CHP_{QHO}	/	CHP_{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

10. THRESHOLD POWER EFFICIENCY

See GN24.8

The Threshold Power Efficiency for the Scheme is 20 %

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

If YES then ➢ Go To Section 11

If NO then ➢ The Scheme does not meet the Threshold Power Efficiency Criterion. The Full Form F3 must be used to complete the Self-Assessment.

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Part 4: Quality Index

11. QUALITY INDEX

See GN24.9 to 24.13

For Schemes that have been certified previously and **prior to 1 January 2016** on the basis of an F3 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 x η_{power}) + (Y x η_{heat}) = (____ x ____) + (____ x ____)

Quality Index = _____

- **If the Quality Index is above 105 then sign the declaration.**
- **If the Quality Index is less than 105 then complete the Full Version of F3.**

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Part 5: Exports of Electricity

ELECTRICITY CUSTOMERS

Does/will your Scheme export Electricity (See GN15.10 to15.14) YES ☐ NO ☐

If YES then ➢ Complete your customers' details in the tables below.
If NO then ➢ Go to Declaration.

Providing details of electricity customers, including the amount of electricity to be supplied to these customers is necessary for Energy Efficiency Certification. See GN15.12.

Organisation Name		Sector (See GN12.1)
Contact Name		Position held:
Address		
Town		
County		Postcode:
Telephone No.		Email:
Annual Electricity supplied_____ MWh		
For electricity sales, is this company (tick where appropriate) • Part of the same qualifying group? ☐ • A licensed electricity supplier? ☐		

Organisation Name		Sector (See GN12.1)
Contact Name		Position held:
Address		
Town		
County		Postcode:
Telephone No.		Email:
Annual Electricity supplied_____ MWh		
For electricity sales, is this company (tick where appropriate) • Part of the same qualifying group? ☐ • A licensed electricity supplier? ☐		

What proportion of the electricity generated is likely to be exported to unknown users (via the grid) .....% of total output

If additional space is required, please insert further tables or photocopy this sheet and include as a numbered attachment.

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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.

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DECLARATION

- I confirm that I am the Responsible Person registered with CHPQA for the operation of the Scheme described in Part 2 of this form.
- I confirm that I have supplied all necessary information as required by the CHPQA Administrator, based on the CHP Scheme described in this form 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 Administrator should any of the above details change.
- I require a Certificate of Energy Efficiency* in accordance with Section 45B of the Capital Allowances Act 2001. (tick box) ☐

  * If a Certificate of Energy Efficiency is required, you must provide a list of identified potential electricity customers and complete Part 5.

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