Quality Assurance for Combined Heat & Power
Form F3 – Self-Assessment for Proposed New and Upgraded CHP Schemes

NOTES:

- This Form F3 is intended for the Self-Assessment of proposed new or upgraded CHP Schemes based on the final Scheme design and anticipated operating conditions.
- Forms F2 and F4 must be submitted for existing Schemes in Initial or Annual Operation.
- This Form must be accompanied by a series of attachments as listed in Section 28 and described under the various Sections to which they refer.
- Guidance Note GN3 has been written to help you complete this Form.
- The most up-to-date version of the CHPQA Standard and Guidance Notes must be used; these can be found on the CHPQA web site (https://www.gov.uk/guidance/combined-heat-power-quality-assurance-programme).
- CHPQA Certificates resulting from CHPQA Validation of your Self-Assessment 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.*

CONTENT OF FORM F3:

Part 1   Scheme Identification and Site Information
Part 2   Detailed Description of Proposed Scheme/Upgrade
Part 3   Scheme Performance for CHPQA
Part 4   Criteria for Good Quality CHP
Part 5   Calculation of CHP_{QPC}
Part 6   Schemes Approaching Initial Operation
Part 7   Calculation of CHP_{QPO} (Initial Operation)
Part 8   Exports of Electricity and Heat
Part 9   Using CHPQA to Claim Renewables Obligation Certificates or Qualify for Contracts for Difference Support
Part 10   ROCs and CFDs CHP_{QPO} calculation (Annual Operation)
Part 11   Secretary of State (CHP) Exemption Certificate Application
Part 12   Declaration and Attachments

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.

Part 1: Scheme Identification & Site Information

1. SCHEME IDENTIFICATION

Site Name	Site ref.*
Company Name (Applicant)	Scheme ref.*

* If this is a completely new Scheme, you must complete Form F1 and submit it to the CHPQA programme Administrator who will provide you with the Site and Scheme reference numbers. For a proposed upgrade to a CHP Scheme within the existing Scheme boundary, enter both the Site and Scheme reference numbers for the existing Scheme. For additional CHP outside the existing Scheme boundary, enter the Site reference only; the Administrator will provide the Scheme reference number.

2. BASIC INFORMATION

This information is required to set out the background and context of the proposed new or upgraded Scheme and to indicate its current state of development.

Sector (see GN 12.1):	
Site/consumer non-production hours:	hours/year
Site/consumer production hours:	hours/year
Site/consumer total operating hours:	hours/year
Does this site have existing CHP Scheme(s)	YES ☐ NO ☐
If YES (A) is this proposal for an upgrade of an Existing Scheme? OR (B) is this proposal for an additional Scheme?	Enter A or B or other explanation, e.g. replacement of existing Scheme.
If there is an existing CHP Scheme on site, has the Scheme been registered with the CHPQA programme? If YES What is the Scheme reference number?	YES ☐ NO ☐
What are the overall objectives of the proposed Scheme/upgrade? (e.g. to better meet existing/increased site heat/power demand). Please include details and relevant attachments on the proposed utilisation and use of heat.	
Provide a general description of the proposed Scheme e.g. ownership, operation and maintenance arrangements, normal running hours, typical operation, and uses of heat and power outputs, and type of prime mover (If there is insufficient space opposite, please provide the description as an Attachment).	
What is the state of development of the proposed Scheme? (e.g. specification/tendering/detail design/procurement/construction/commissioning)	
When do you expect to: (a) start construction (b) start commissioning (c) start Initial Operation (if known, see GN10.17) (d) date of first firing	State month and year for each phase:
Scheme Technology Type (main prime mover)	

3. SITE/CONSUMER ENERGY DEMANDS

Period 1 (e.g. Winter, production campaign period 1, etc.)

Period: Months: (e.g. Oct-Apr):

Heat/Steam Demand:

Base…………………………………kWth* for …………………hours

Peak…………………………………kWth* for…………………hours

Average……………………………..kWth* for…………………hours

Electricity Demand:

Base………………………………. kWe for…………………hours

Peak………………………………. kWe for…………………hours

Average…………………………. kWe for…………………hours

Period 2 (e.g. Summer, production campaign period 2, etc.)

Period: Months: (e.g. May-Sep):

Summer Period

Heat/Steam Demand:

Base…………………………………kWth* for ………………hours

Peak…………………………………kWth* for………………hours

Average: …………………………kWth* for………………hours

Electricity Demand:

Base…………………………………kWe for……………….…hours

Peak…………………………………kWe for…………………hours

Average……………………………kWe for…………………..hours

Predicted Future Annual Loads

Heat/Steam Demand:

Base…………………………kWth* for …………………hours per annum

Peak…………………………kWth* for…………………hours per annum

Average: …………………………kWth* for…………………hours per annum

Electricity Demand:

Base…………………………………kWe for…………………hours per annum

Peak…………………………………kWe for………………..hours per annum

Average……………………………kWe for………………..hours per annum

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

Part 2: Detailed Description of Proposed Scheme/Upgrade

Identify each plant item on your **CHP Scheme Line Diagram** (to be included as Attachment 1) and, in the table in Section 4 below, by tag number using the notation in Guidance Note GN12.3.

4. SCHEME EQUIPMENT DETAILS (PROPOSED AND EXISTING EQUIPMENT)

Use this table to itemise all items of plant, e.g. prime movers, boilers, duct burners, etc, within your CHP Scheme boundary. Include any mechanical power generation plant but express the capacity in terms of electrical power equivalent (mechanical power x 1.05, see GN15.4) and mark with an asterisk.

Tag Number	Manufacturer	Model/Type	Design Capacity (Referenced to ISO conditions)	
			Heat	**Power**
Proposed New Equipment				
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
Existing CHP Equipment Retained (within the Scheme boundary)				
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
			kW$_{th}$	kW$_e$
Total Power Capacity (expressed as electrical output capacity) = CHP$_{TPC}$				kW$_e$

5. PROJECTED SCHEME PERFORMANCE DETAILS

Summarise the CHP process design and the three anticipated operating cases in the table below. This information must be supported by Energy Flow Diagrams for each of the three cases showing heat and material flows (Attachments 2 to 5), Site and Scheme Annual and Daily Heat Profiles (Attachments 6 and 7) and Load Duration Curves (Attachment 8). (See GN12.4 & GN12.5)

If the site has existing CHP within the same Scheme boundary as the proposed plant, provide information for the complete Scheme.

Stream No.	Description	Unit	Projected average annual loads (See note below Table – *supporting evidence*)		MaxHeat under Long Term AO (See CHPQA Standard Section 4 or GN10.14)
			First year of operation*	Long Term Annual Operation	
Scheme operating hours per year		hours			
Energy Inputs (fuels on **GCV** basis and heat)					
		kW			
		kW			
		kW			
		kW			
		kW			
		kW			
Total Energy Inputs		**kW**			
Power outputs (electricity generated and electrical equivalent of mechanical shaft power)					
		kW			
		kW			
		kW			
		kW			
		kW			
		kW			
Total Power Outputs		**kW**			
Heat outputs, energy flows (CHPQA basis - See GN 16)					
		kW			
		kW			
		kW			
		kW			
		kW			
		kW			
Total Heat Outputs		**kW**			

Stream No.	Description	Unit	Projected average annual loads		MaxHeat under Long Term AO Minimum cumulative hours:
			First year of operation*	Long Term Annual Operation	
Additional information					
Steam mass flows					
		kg/h			
		kg/h			
		kg/h			
		kg/h			
		kg/h			
Condensate returned					
		kg/h			
		kg/h			
		kg/h			

* First year of operation is the period from the start of Initial Operation to the end of the first calendar year during which the plant starts operating as a CHP. For example, if you anticipate entering Initial Operation at the beginning of May, then the Scheme operating hours for the first year of operation is from May until the end of December that year, and projected annual performance should be based on these eight months.

Note: Please provide below or as an Attachment evidence of anticipated initial and future loads (e.g. 5-year business plan to support future loads):

6. SCHEME MONITORING ARRANGEMENTS

See GN 12, 13, 14, 15, 16, 17, 18, 20 & 22

Use this table to list all existing and proposed metering arrangements (including the meters by which you are billed) for your Scheme inputs and outputs. See GN12.7

Stream numbers should be as identified on your Scheme Line Diagram at Attachment 1. The table should detail the anticipated uncertainty values for all existing and proposed metering arrangements. See GN13.10 to GN13.13.

Attach details of any indirect methods used to derive unmetered inputs or outputs as a numbered Attachment (include below the monitoring upon which these rely). See GN20 to GN22

Stream No.	Metered input or output	Uncert- ainty %	Stream No.	Metered input or output	Uncert- ainty %

Part 3: Scheme Performance for CHPQA

7. PROJECTED ANNUAL AND MAXHEAT OPERATION

Important: Where future heat demand is greater than present site demands, please attach evidence as a numbered Attachment of when future loads will come on stream. See GN3 (Part 3, section 7)

| | Projected average annual loads (from Section 5) | | MaxHeat under LTAO | Units |
	Initial Operation (IO)	Long Term Annual Operation (LTAO)		
Energy inputs (GCV basis)				MW
Heat outputs				MWth
Power outputs				MWe
Heat efficiency (η_{heat})				%
Power efficiency (η_{power})		*		%

* This figure is required in Part 4, Section 10

8. QI DEFINITION

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.

Use the table below to enter the appropriate QI definition for your Scheme. If your Scheme uses a mixture of fuels, you must calculate a weighted average QI definition.

Please refer to Issue 6 of the CHPQA Standard if further clarification is required.

| Fuel type | Fraction of Total (Fn) | Factors | | Weighted factors | |
		X	Y	Fn x X	Fn x Y
	Sum	X =		Y =	

9. QUALITY INDEX (PROJECTED ANNUAL AND MAXHEAT OPERATION)

	X x Power Efficiency	+ Y x Heat Efficiency	= QI
Initial Operation (IO)	_____ x _____	+ _____ x _____	= _____
Long Term Annual Operation (LTAO)	_____ x _____	+ _____ x _____	= _____ *
MaxHeat under LTAO	_____ x _____	+ _____ x _____	= _____ *

* These figures are required in Part 4, Section 10

Part 4: Criteria for Good Quality CHP

10. SCHEME PERFORMANCE INDICATORS

Scheme Power Efficiency under Long Term Annual Operation (from Section 7)	%
Scheme QI under Long Term Annual Operation (from Section 9)	
Scheme QI at MaxHeat under Long Term Annual Operation (from Section 9)	

11. THRESHOLD CRITERIA

QI threshold	105	(a) under Long Term Annual Operation OR if not (b) at MaxHeat under LTAO
Power Efficiency threshold, %	20%	under Long Term Annual Operation

Did your Scheme meet the QI Threshold ?	(tick box)	YES ☐	NO ☐	

If YES then ➢ Proceed to Part 6 (Page 12)

If NO then ➢ Proceed to Part 5 (Page 10)

Part 5: Calculation of CHP$_{QPC}$

IMPORTANT: CHP$_{QPC}$ calculation is based on projections of fuel use (GCV), power generation and heat supply, all in MW, based on anticipated maximum heat output under normal operating conditions (MaxHeat conditions). See GN27.

Schemes without condensing steam turbine(s) complete Section 12.
Schemes with condensing steam turbine(s) complete Section 13.

12. CHP QUALIFYING POWER CAPACITY – NO CONDENSING STEAM TURBINE

Step 1 - Calculate the Heat Efficiency required to achieve the Threshold QI$_{MaxHeat}$ of 105

$$\text{New } \eta_{heat(MaxHeat)} = \frac{(QI_{TH} - (X \times \eta_{power(MaxHeat)}))}{Y} = \frac{(105 - (\underline{\quad} \times \underline{\quad}))}{\underline{\quad}} = \underline{\quad} \%$$

Step 2 - Determine the equivalent Heat-to-Power ratio

Equivalent Heat-to-Power ratio = New $\eta_{heat(MaxHeat)}$ / $\eta_{power(MaxHeat)}$ = $\underline{\quad}$ / $\underline{\quad}$ = $\underline{\quad}$

Step 3 - Determine the Qualifying Power Capacity, CHP$_{QPC}$

CHP$_{QPC}$ = Predicted MaxHeat to be supplied / Equivalent Heat-to-Power ratio

= $\underline{\quad\quad\quad}$ / $\underline{\quad\quad\quad}$ = $\underline{\quad\quad\quad}$ MWe

➢ Now proceed to Part 6 (Page 13)

13. CHP QUALIFYING POWER CAPACITY – CONDENSING STEAM TURBINE

Step 1 - Define Z ratio for the CHP Scheme.

From Table GN28-1 in Guidance Note GN28, select the most appropriate Z ratio for your Scheme. Complete the statement below:

Steam export pressure $\underline{\quad}$ bar(a); Steam Turbine size $\underline{\quad}$ MW$_e$; Selected Z ratio $\underline{\quad}$

Step 2 - Calculate Heat Efficiency required to achieve the Threshold QI$_{(MaxHeat)}$ of 105

$$\text{Change in } \eta_{heat(MaxHeat)} = \frac{\text{Change in QI}*}{\left(Y - \dfrac{X}{Z\,\text{ratio}}\right)} = \frac{(105 - \underline{\quad})}{\left(\underline{\quad} - \dfrac{\underline{\quad}}{\underline{\quad}}\right)} = \underline{\quad\quad} \%$$

New $\eta_{heat(MaxHeat)}$ = Change in $\eta_{heat(MaxHeat)}$ + $\eta_{heat(MaxHeat)}$ = $\underline{\quad\quad}$ + $\underline{\quad\quad}$ = $\underline{\quad\quad}$ %

* Change in QI = Threshold QI (105) minus actual QI$_{(MaxHeat)}$ from Section 10

Step 3 - Determine the corresponding change in Power Efficiency.

Change in $\eta_{power(MaxHeat)}$ = Change in $\eta_{heat(MaxHeat)}$ / Z ratio = _____ / _____ = _____ %

New $\eta_{power(MaxHeat)}$ = $\eta_{power(MaxHeat)}$ - Change in $\eta_{power(MaxHeat)}$ = _____ - _____ = _____ %

Step 4 - Determine the equivalent Heat-to-Power ratio.

Equivalent Heat-to-Power ratio = New $\eta_{heat(MaxHeat)}$ / New $\eta_{power(MaxHeat)}$ = _____ / _____ = _____

Step 5 - Calculate the CHP$_{QPC}$.

CHP$_{QPC}$ = Predicted MaxHeat to be supplied / Equivalent Heat-to-Power ratio

= _____ / _____ = _____ MWe

Part 6: Schemes Approaching Initial Operation

14. INITIAL OPERATION

Do you expect your Scheme to become operational in the current calendar year?
(tick box)   YES ☐   NO   ☐

15. INITIAL ANNUAL ENERGY INPUTS AND OUTPUTS

	Average annual loads, MW (from Section 7)	x	Annual operating hours (from Section 5)	= Annual MWh
Energy Inputs				= _____ = CHP_{TFI}
Heat Outputs		x	_____	= _____ = CHP_{QHO}
Power Outputs				= _____ = CHP_{TPO}

16. GOOD QUALITY CRITERIA FOR INITIAL OPERATION

	Initial Operation	Threshold Criteria
Power Efficiency under Initial Operation	_____ % *	20 %
QI under Initial Operation ($QI_{(IO)}$)	_____ **	95

* From Part 3, Section 7   ** From Part 3, Section 9

17. QUALIFYING FUEL INPUT CHP_{QFI} (INITIAL OPERATION)

If Power Efficiency $\geq$ threshold (20%) then: $CHP_{QFI} = CHP_{TFI} =$ _____   MWh
If Power Efficiency < threshold then: $CHP_{QFI} = (CHP_{TPO} / 0.2) =$ _____   MWh

18. QUALIFYING POWER OUTPUT CHP_{QPO} (INITIAL OPERATION)

If QI $\geq$ threshold (95) then: $CHP_{QPO} = CHP_{TPO} =$ _____   MWh
Proceed to Part 8
If QI < threshold then: CHP_{QPO} must be calculated.
Proceed to Part 7

Part 7: Calculation of CHP$_{QPO}$ (Initial Operation)

NOTES:

- If a CHP Scheme achieves a QI less than the Threshold, the CHP$_{QPO}$ is calculated. The CHP$_{QPO}$ is the proportion of the power generated that qualifies as an output from 'Good Quality' CHP.
  See GN26 & 28
- CHP$_{QPO}$ calculation is based on fuels used, power generated and heat supplied in MWh based on Initial Operation from Part 6.

  ➢ Schemes without condensing steam turbine(s) complete Section 19.
  ➢ Schemes with condensing steam turbine(s) complete Section 20

19. CHP QUALIFYING POWER OUTPUT - WITH NO CONDENSING STEAM TURBINE.

If a CHP Scheme achieves a QI less than the Threshold, the CHP$_{QPO}$ is calculated. The CHP$_{QPO}$ is the proportion of the power generated that qualifies as an output from 'Good Quality' CHP. See GN26

Step 1 - Calculate the heat efficiency required to achieve the QI Threshold (QI $_{TH}$)

New $\eta_{heat(IO)}$ $= \dfrac{(QI_{TH} - (X \times \eta_{power(IO)}))}{Y}$ $= \dfrac{(95 - (\underline{\quad} \times \underline{\quad}))}{\underline{\quad}}$ $= \underline{\quad}$ **%**

Step 2 - Determine the equivalent heat to power ratio

Equivalent Heat to Power ratio = New $\eta_{heat(IO)}$ / $\eta_{power(IO)}$ = $\underline{\quad}$ / $\underline{\quad}$ = $\underline{\quad}$

Step 3 - Determine the CHP$_{QPO}$.

CHP$_{QPO}$ =   CHP$_{QHO}$ / Equivalent Heat to Power ratio

= $\underline{\qquad}$ / $\underline{\qquad}$ = $\underline{\qquad}$ MWhe

CHP$_{QPO}$ = Qualifying Power Output = $\underline{\qquad\qquad}$ MWh$_e$

20. CHP QUALIFYING POWER OUTPUT - WITH CONDENSING STEAM TURBINE.

Step 1 - Define Z ratio for the CHP Scheme.

From Table GN28-1 in Guidance Note GN28, select the most appropriate Z ratio for your Scheme. Complete the statement below:

Steam export pressure _____ bar(a); Steam Turbine size _____ MW$_e$; Selected Z ratio _____

Step 2 - Calculate heat efficiency required to achieve the QI Threshold value.

$$\text{Change in } \eta_{heat(IO)} = \frac{\text{Change in QI} *}{\left(Y - \dfrac{X}{Z \text{ ratio}}\right)} = \frac{95 - \rule{2em}{0.4pt}}{\left(\rule{2em}{0.4pt} - \dfrac{\rule{2em}{0.4pt}}{\rule{2em}{0.4pt}}\right)} = \rule{2em}{0.4pt} \%$$

$$\text{New } \eta_{heat(IO)} = \text{Change in } \eta_{heat(IO)} + \eta_{heat(IO)} = \rule{3em}{0.4pt} + \rule{3em}{0.4pt} = \rule{2em}{0.4pt} \%$$

* Change in QI = Threshold QI minus Actual QI(IO)

Step 3 - Determine the corresponding change in power efficiency.

$$\text{Change in } \eta_{power(IO)} = \text{Change in } \eta_{heat(IO)} / Z \text{ ratio} = \rule{3em}{0.4pt} / \rule{3em}{0.4pt} = \rule{2em}{0.4pt} \%$$

$$\text{New } \eta_{power(IO)} = \eta_{power(IO)} - \text{Change in } \eta_{power(IO)} = \rule{3em}{0.4pt} - \rule{3em}{0.4pt} = \rule{2em}{0.4pt} \%$$

Step 4 - Determine the equivalent Heat to Power ratio

$$\text{Equivalent Heat to Power ratio} = \text{New } \eta_{heat(IO)} / \text{New } \eta_{power(IO)} = \rule{2em}{0.4pt} / \rule{2em}{0.4pt} = \rule{2em}{0.4pt}$$

Step 5 - Calculate the CHP$_{QPO}$

$$\text{CHP}_{QPO} = \text{CHP}_{QHO} / \text{Equivalent Heat to Power ratio}$$

$$= \rule{5em}{0.4pt} / \rule{5em}{0.4pt} = \rule{5em}{0.4pt} \text{ MWh}_e$$

CHP$_{QPO}$ = Qualifying Power Output = _____ MWh$_e$

Part 8: Exports of Electricity and Heat

21.ELECTRICITY AND HEAT CUSTOMERS

Does your Scheme export Electricity (See GN15.10 to15.14)	YES ☐	NO ☐
Does your CHP Scheme export Heat (See GN16.5 to16.7)	YES ☐	NO ☐

If YES to either of these then ➢ Complete your customers' details in the tables below.
If NO to both of these then ➢ Go to Part 11 (Page 22).

Details of heat customers, including the amount of heat supplied to these customers, is necessary for CHPQA Certification.

Providing details of electricity customers, including the amount of electricity supplied to these customers is necessary for Energy Efficiency Certification and is also required by the Secretary of State under the Electricity Act 1989 (S98). Completing these details here will save you being asked to supply them separately. See GN15.12.

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

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

Part 9: Using CHPQA to Claim Renewables Obligation Certificates or Qualify for Contracts for Difference Support

22. STATEMENT OF INTENTION TO USE CHPQA TO CLAIM ROCS OR QUALIFY FOR CFD

If a Scheme uses renewable fuels and you wish to use CHPQA to claim ROCs or qualify for Contracts for Difference support, you will need to obtain a GN44 CHPQA certificate.

If you wish to use CHPQA to claim ROCs or qualify for Contracts for Difference support, please tick the "Yes" in the appropriate box below, if not then please tick "No" and go straight to Part 11 of the submission.

Do you wish to use CHPQA to claim ROCs? (tick box)	YES ☐	NO ☐
Do you wish to use CHPQA qualify for CFD support? (tick box)	YES ☐	NO ☐

23. ROCS AND CFD QI DEFINITIONS

ROCs

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 2 of **Issues 4 and 5** of Guidance Note 44 (GN44) will continue to be used for certification in 2017. (These formulae are also reproduced as Table A2 of GN44 Issue 6.)

However, the QI formulae in earlier issues of Guidance Note 44 and associated fuel categories will continue to apply to Schemes that were in operation or that can demonstrate they reached financial close, prior to 26 July 2012. These earlier QI formulae are reproduced as Table 3 of GN44 Issue 4 and as Table A1 of GN44 Issue 6.

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 2 of GN44 **Issue 6** must be used for certification/re-certification in 2017.

CFDs

Operators of Schemes intending to use CHPQA in connection with any 'with CHP' CFD entered into, or to be entered into, on or after the date of the publication of Guidance Note 44 Issue 6, i.e. 21 October 2016, should use the relevant QI formula in Table 2 of GN44 **Issue 6**, irrespective of whether the Scheme has previously been certified on the basis of any other QI formula.

Operators of Schemes for which a CFD contract was entered into prior to the publication of GN44 Issue 6 should use the relevant QI formula in Table 2 of GN44 **Issue 5** (reproduced as Table A2 of GN44 Issue 6), irrespective of the date of any previous or likely future CHPQA certification.

See GN44 Issue 6 for further information.

If your Scheme uses a mixture of fuels, you must calculate a weighted average QI definition using fuel fractions calculated in Part 3 section 8.

Fuel type	Fraction of Total (Fn)	Factors		Weighted factors	
		X	**Y**	**Fn x X**	**Fn x Y**
	Sum	**X =**		**Y =**	

24. ROCS AND CFD QUALITY INDEX (LONG TERM ANNUAL OPERATION)

	X x Power Efficiency + Y x Heat Efficiency = QI		
Long Term Annual Operation	_____ x _____ + _____ x _____		= _____ *

* These figures are required in Part 10, Section 26 or 27

ROCS AND CFD QUALITY INDEX CRITERIA   ➢ See GN44

CHP Schemes wishing to claim ROCs or qualify for CfD support will be validated against a QI Threshold of 100. For ROC and CfD eligibility, a CHP Scheme is not required to meet any power efficiency threshold.

Does your Scheme achieve a QI of 100 (in the calculation above)?
(tick box)   YES ☐   NO ☐

If YES then   ➢   Proceed to Part 11 (Page 21)

If NO then   ➢   Proceed to Part 10 (Page 19)

Note: The Self-Assessment for long term operating conditions (i.e. normal operation) should be based on the expected whole year energy utilisation averaged over the Scheme's annual operating hours (see GN3). The only exception is that Residential Community Heating Schemes can be Self-Assessed over a seven-month Heating Season, subject to meeting the conditions set out in GN30.

Part 10: ROCs and CFD CHP$_{QPO}$ calculation (Annual Operation)

NOTES:

- If a CHP Scheme achieves a QI less than the Threshold of 100, the CHP$_{QPO}$ is calculated. The CHP$_{QPO}$ is the proportion of the power generated that qualifies as an output from 'Good Quality' CHP. See GN26 & 28
- CHP$_{QPO}$ calculation is based on fuels used, power generated and heat supplied in MWh based on annual data submitted in Part 2. See GN26.

  ➢ Schemes without condensing steam turbine(s) complete Section 25.
  ➢ Schemes with condensing steam turbine(s) complete Section 26

25. CHP QUALIFYING POWER OUTPUT - WITH NO CONDENSING STEAM TURBINE.

If a CHP Scheme achieves a QI less than the Threshold, the CHP$_{QPO}$ is calculated. The CHP$_{QPO}$ is the proportion of the power generated that qualifies as an output from 'Good Quality' CHP. See GN26

Step 1 - Calculate the heat efficiency required to achieve the QI Threshold (QI $_{TH}$)

New $\eta_{heat(AO)}$ $= \dfrac{(QI_{TH} - (X \times \eta_{power(AO)}))}{Y} = \dfrac{(100 - (\underline{\qquad} \times \underline{\qquad}))}{\underline{\qquad}} = \underline{\qquad}$ **%**

Step 2 - Determine the equivalent heat to power ratio

Equivalent Heat to Power ratio = New $\eta_{heat(AO)}$ / $\eta_{power(AO)}$ = $\underline{\qquad}$ / $\underline{\qquad}$ = $\underline{\qquad}$

Step 3 - Determine the CHP$_{QPO}$.

CHP$_{QPO}$ = CHP$_{QHO}$ / Equivalent Heat to Power ratio

= $\underline{\qquad}$ / $\underline{\qquad}$ = $\underline{\qquad}$ MWhe

CHP$_{QPO}$ = Qualifying Power Output = $\underline{\qquad\qquad}$ MWh$_e$

26. CHP QUALIFYING POWER OUTPUT - WITH CONDENSING STEAM TURBINE.

Step 1 - Define Z ratio for the CHP Scheme.

From Table GN28-1 in Guidance Note GN28, select the most appropriate Z ratio for your Scheme. Complete the statement below:

Steam export pressure _____ bar(a); Steam Turbine size _____ MW$_e$; Appropriate Z ratio _____

Step 2 - Calculate heat efficiency required to achieve the QI Threshold value.

$$\text{Change in } \eta_{heat(AO)} = \frac{\text{Change in QI *}}{\left(Y - \dfrac{X}{Z\,\text{ratio}}\right)} = \frac{100 - \underline{\quad}}{\left(\underline{\quad} - \dfrac{\underline{\quad}}{\underline{\quad}}\right)} = \underline{\quad}\ \%$$

$$\text{New } \eta_{hea(AO)} = \text{Change in } \eta_{heat(AO)} + \eta_{heat(AO)} = \underline{\quad} + \underline{\quad} = \underline{\quad}\ \%$$

* Change in QI = Threshold QI minus Actual QI(IO)

Step 3 - Determine the corresponding change in power efficiency.

$$\text{Change in } \eta_{power(AO)} = \text{Change in } \eta_{hea(AO)} / Z\,\text{ratio} = \underline{\quad} / \underline{\quad} = \underline{\quad}\ \%$$

$$\text{New } \eta_{power(AO)} = \eta_{power(AO)} - \text{Change in } \eta_{power(AO)} = \underline{\quad} - \underline{\quad} = \underline{\quad}\ \%$$

Step 4 - Determine the equivalent Heat to Power ratio

$$\text{Equivalent Heat to Power ratio} = \text{New } \eta_{heat(AO)} / \text{New } \eta_{power(AO)} = \underline{\quad} / \underline{\quad} = \underline{\quad}$$

Step 5 - Calculate the CHP$_{QPO}$

$$\text{CHP}_{QPO} = \text{CHP}_{QHO} / \text{Equivalent Heat to Power ratio}$$

$$= \underline{\qquad\qquad} / \underline{\qquad\qquad} = \underline{\qquad\qquad} \text{ MWh}_e$$

CHP$_{QPO}$ = Qualifying Power Output = _____ MWh$_e$

Part 11: 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.

Part 12: Declaration & Attachments

27.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 Section 21.

Signature _____ **Date** _____

Name _____ **(block capitals)**

Position _____ **(block capitals)**

28.LIST OF ATTACHMENTS

Attachment No.	Description (Title, Drawing No., Revision)	Tick
1.	Scheme Line Diagram	
2.	Energy Flow Diagram (EFD), Design MCR Case	
3.	EFD, Initial Operation	
4.	EFD, Long Term Annual Operation	
5.	EFD, MaxHeat Operation	
6.	Site and Scheme Annual Heat Loads	
7.	Site and Scheme Daily Heat Loads	
8.	Site and Scheme Heat Load Duration Curves	
9.		
10.		
11.		
12.		
13.		
14.		
15.		