

# GUIDANCE NOTE CHPGO

## PROVISION OF DATA FOR THE ASSESSMENT OF HIGH EFFICIENCY CHP POWER GENERATION FOR THE PURPOSE OF GUARANTEE OF ORIGIN (FORM CHPGO)

### INTRODUCTION

#### CHPGO-1

The purpose of Form CHPGO is to enable applicants to provide operating data to the CHPQA Administrator, to permit the assessment of high efficiency CHP electricity generation for the purpose of Guarantee of Origin, as required under the EU Cogeneration Directive (Ref. 3). The assessment will be undertaken by the CHPQA Administrator as the body nominated by the Department for Environment, Food and Rural Affairs.

The assessment process involves:-

- (a) determining the quantity of CHP electricity, heat and energy inputs (fuel) in accordance with Annexe II of the EU Cogeneration Directive and
- (b) the calculation of Primary Energy Saving (PES) to determine the quantity of High Efficiency CHP Electricity (HICHPE) in accordance with Annexe III of the EU Cogeneration Directive.

#### CHPGO-2

Applicants whose Schemes are registered under CHPQA will have already submitted a scheme description using the CHPQA form F2 and required attachments including a scheme line diagram that defines the scheme boundaries. It is important to note that under the Cogeneration Directive it is not permitted to include “heat-only” boilers. These are fired boilers or process waste heat boilers whose steam output does not contribute to power generation through steam turbines. Consequently the energy inputs and heat outputs of such boilers, if included in the existing Scheme boundary, must be separately identified in the data provided on Form CHPGO.

#### CHPGO-3

In addition to Form CHPGO, applicants whose Schemes are not registered under CHPQA are required to submit a scheme description using the CHPQA form F2 and required attachments including a scheme line diagram that defines the scheme boundaries. The boundary should exclude any “heat-only” boilers as described in clause CHPGO-2 above.

#### CHPGO-4

This Guidance Note together with the CHPQA Guidance Notes provide all the information needed to enable applicants to complete Form CHPGO and, if necessary, the CHPQA Form F2. Should applicants have any unanswered questions, further assistance may be obtained by contacting The Administrator, CHPQA programme, The Gemini Building, Fermi Avenue, Didcot OX11 0QR, by email at [chpqainfo@chpqa.com](mailto:chpqainfo@chpqa.com) or by phoning the CHPQA Helpline on 0870 190 6196.

## REFERENCE DOCUMENTS

### CHPGO-5

Detailed knowledge of the Statutory Instrument (Refs. 1 and 2), the EU Cogeneration Directive (Refs. 3 and 4) and the CHPQA Standard (Ref. 5) is not essential for the completion of Form CHPGO. Applicants will need to refer to specific CHPQA Guidance Notes (Ref. 6) as indicated on Form CHPGO. In addition applicants with Schemes not registered with CHPQA will need to complete CHPQA Forms F1 and F2 (Ref. 7).

- 1** STATUTORY INSTRUMENTS. 2007 No. 292 ENERGY CONSERVATION THE GUARANTEES OF ORIGIN OF ELECTRICITY PRODUCED FROM HIGH EFFICIENCY COGENERATION REGULATIONS 2007  
[http://www.opsi.gov.uk/SI/si2007/uksi\\_20070292\\_en.pdf](http://www.opsi.gov.uk/SI/si2007/uksi_20070292_en.pdf)
- 2** EXPLANATORY MEMORANDUM. THE GUARANTEES OF ORIGIN OF ELECTRICITY PRODUCED FROM HIGH EFFICIENCY COGENERATION REGULATIONS 2007, 2007 No. 292  
[http://www.opsi.gov.uk/SI/em2007/uksiem\\_20070292\\_en.pdf](http://www.opsi.gov.uk/SI/em2007/uksiem_20070292_en.pdf)
- 3.** DIRECTIVE 2004/8/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 February 2004 on the promotion of cogeneration based on a useful heat demand in the internal energy market and amending Directive 92/42/EEC  
[http://eur-lex.europa.eu/LexUriServ/site/en/oj/2004/l\\_052/l\\_05220040221en00500060.pdf](http://eur-lex.europa.eu/LexUriServ/site/en/oj/2004/l_052/l_05220040221en00500060.pdf)
- 4.** COMMISSION DECISION of 21 December 2006 establishing harmonised efficiency reference values for separate production of electricity and heat in application of Directive 2004/8/EC of the European Parliament and of the Council (2007/74/EC)  
[http://eur-lex.europa.eu/LexUriServ/site/en/oj/2007/l\\_032/l\\_03220070206en01830188.pdf](http://eur-lex.europa.eu/LexUriServ/site/en/oj/2007/l_032/l_03220070206en01830188.pdf)
- 5.** CHPQA STANDARD, Issue 1, November 2000  
<http://www.chpqa.com/html/documents.htm>
- 6.** CHPQA GUIDANCE NOTES  
<http://www.chpqa.com/html/notes.htm>
- 7.** CHPQA FORM F2 – CHP SCHEME DESCRIPTION  
<http://www.chpqa.com/html/forms.htm>

## **NOTES FOR COMPLETION OF FORM CHPGO**

### **CHPGO-6.1**

Form CHPGO has been divided into six Parts:

- Part 1 Scheme Identification and Declaration & Attachments
- Part 2 Scheme Energy Inputs and Outputs
- Part 3 Enabling Information
- Part 4 Data for Determination of non-CHP Heat and Associated Fuel
- Part 5 Data for Determination of “Full-CHP” Power to Heat Ratio
- Part 6 Addendum

### **CHPGO-6.2**

#### **Part 1 SCHEME IDENTIFICATION AND SITE INFORMATION**

##### **1 Scheme Identification**

Under Scheme Identification, enter the site name, company name and site and Scheme reference numbers, if you know them. The site and Scheme reference numbers are unique CHPQA reference numbers provided by the Administrator.

If this is a completely new Scheme, on a new site not already Registered under CHPQA, Form F1 must be completed and submitted to the Administrator who will provide you with the Site and Scheme reference numbers.

##### **2 Declaration & Attachments**

The declaration is a signed statement by the Responsible Person confirming the validity of the information provided. Applicants should note that for resolving queries that arise on the details submitted contact will be with the Responsible Person.

Tick each of Attachments 1 to 8 that is included with Form CHPGO. Add details of any additional attachments. These may include, but are not restricted to supporting calculations:

### **CHPGO-6.3**

#### **Part 2 SCHEME ENERGY INPUTS AND OUTPUTS**

##### **3. Period of Operation for Guarantee of Origin**

The period of operation for CHPGO shall be between three and twelve consecutive months, dependent on the Applicant’s specified period for the requested CHPGO certificate.

##### **4. Energy Inputs**

All fuel energy inputs should be based on gross calorific value (higher calorific value) and without adjustment for excessive uncertainty. The use of gross calorific value is for consistency with CHPQA. The assessor will carry out the appropriate conversions to a net calorific value basis as required by the Cogeneration Directive using data provided in Part 3, Section 8. Adjustments for metering uncertainties are not required under the Cogeneration Directive.

Fuel inputs in any “heat-only” fired boilers must be identified and tabulated separately from other energy inputs. Similarly, equivalent fuel inputs in any “heat-only” process waste heat boilers must be identified and tabulated separately from other energy inputs.

## **5. Power Outputs**

Record the power generated by the CHP Scheme (power is gross generated i.e. measured at the generator terminals) without adjustment for excessive uncertainty.

Mechanical power should be included and reported as equivalent electrical output identified by calculation number. For consistency with CHPQA use the mechanical to electrical equivalent factor of 1.05. The assessor will reverse this adjustment to comply with the Cogeneration Directive.

## **6. Useful Heat Outputs**

Record the useful heat supplied by the CHP Scheme without adjustment for excessive uncertainty. Heat outputs as steam should be reported relative to a datum of water at a temperature of 10°C, as described in the CHPQA GN16.3.

Heat outputs from any “heat-only” fired boilers must be identified and tabulated separately from other heat outputs. Similarly, heat outputs from any “heat-only” process waste heat boilers must be identified and tabulated separately from other heat outputs.

### **CHPGO-6.4**

#### **Part 3 ENABLING INFORMATION**

## **7. CHP Scheme Data**

The information in clauses 7.1 to 7.5 is required to determine the appropriate reference values for the separate generation of power and heat to determine the primary energy saving under Annex III of the Cogeneration Directive.

## **8. Fuels Data**

This information is required to permit the assessor to convert the energy inputs to a net calorific value basis.

If known, input the dry fuel gross/net calorific value ratio for the applicable blank space in the “Claimed gross/net dry CV” column. Also, where applicable enter the mean moisture content of the fuel, as fired.

If solid fuel is used Applicant should provide a copy of their energy input analysis (i.e conversion from mass to equivalent MWh).

### **CHPGO-6.5**

#### **Part 4 DATA FOR DETERMINATION OF NON-CHP HEAT AND ASSOCIATED FUEL**

## **9. Scheme non-CHP Heat Declaration**

Non-CHP heat is a heat output that is not associated with power generation. The Scheme has non-CHP heat outputs if, for example:

- A supplementary or auxiliary fired heat recovery boiler within the scheme generates steam that does not ALL flow through a steam turbine or steam engine to generate electrical or mechanical power.
- A fired boiler within the scheme generates steam that does not ALL flow through a steam turbine or steam engine to generate electrical or mechanical power.
- A process heat recovery boiler within the scheme generates steam that does not ALL flow through a steam turbine or steam engine to generate electrical or

If the scheme has no non-CHP heat outputs, enter NO and proceed to Part 5.

## **10. Schemes with Fired Boilers that Do Not Fully Contribute to CHP Power Outputs**

Enter data in Sections 10.1 and/or 10.2 and/or 10.3 as appropriate for each FB in the Scheme. A fired boiler that does not fully contribute to CHP power outputs is one whose steam does not ALL pass through a steam turbine or steam engine to generate electrical or mechanical power. Complete one column of data for each boiler. Enter the total fuel input and/or steam output for the whole of the period covered by the application for CHPGO.

Where indicated by Notes 1, 2 or 3 it is a requirement that supporting information and calculations are included as Attachments to the Form CHPGO.

## **11. Schemes with Supplementary or Auxiliary fired Heat Recovery Boilers that Do Not Fully Contribute to CHP Power Outputs**

Enter data in Sections 11.1 and/or 11.2 as appropriate for each HRB in the Scheme. A heat recovery boiler that does not fully contribute to CHP power outputs is one whose steam does not ALL pass through a steam turbine or steam engine to generate electrical or mechanical power. Complete one column of data for each boiler. Enter the total fuel input and/or steam output for the whole of the period covered by the application for CHPGO.

Supplementary firing is where there is not separate combustion air supply to burn the fuel (i.e. it uses up the excess oxygen in the exhaust gases from the associated gas turbine or engine). Auxiliary firing is where the fuel has its own dedicated supply of combustion air. Some designs permit either supplementary or auxiliary firing.

Where indicated by Notes 1, 2 or 3 it is a requirement that supporting information and calculations are included as Attachments to the Form CHPGO.

## **12. Schemes with Supplementary or Auxiliary firing of Direct-Fired Equipment (e.g. dryers)**

Enter data in Sections 12.1 and/or 12.2 as appropriate for each item of direct-fired equipment in the Scheme. A heat recovery boiler that does not fully contribute to CHP power outputs is one whose steam does not ALL pass through a steam turbine or steam engine to generate electrical or mechanical power. Complete one column of data for each boiler. Enter the total fuel input and/or steam output for the whole of the period covered by the application for CHPGO.

See the note above on supplementary and auxiliary firing.

Where indicated by Notes 1, 2 or 3 it is a requirement that supporting information and calculations are included as Attachments to the Form CHPGO.

## **CHPGO-6.6**

### **Part 5 DATA FOR DETERMINATION OF “FULL-CHP” POWER TO HEAT RATIO**

#### **13. Schemes Without Power Loss and No Heat Rejection**

Power loss is the trade-off in power output that would occur at constant fuel input for an increase in heat outputs for schemes that include pass-out or condensing steam turbines. A scheme without power loss” is one that does not include either partially (pass-out) or fully condensing steam turbines.

Heat rejection occurs where some of the exhaust gases from a gas turbine or reciprocating engine are dumped to atmosphere without passing through a heat recovery boiler or direct heated equipment such as a dryer. For the purposes of analysis short-term heat rejection during start-up or shutdown are ignored. A scheme without heat rejection is one that does not dump exhaust gases, or engine jacket water in the case of reciprocating engines, without heat recovery in normal operation.

If the scheme has no power loss and no heat rejection no further data is required and the Form CHPGO is completed.

#### **14. Schemes With Heat Rejection but No Power Loss**

Data is required based on a test carried out over a period of at least two-hours with no heat rejection (i.e. exhaust gases and engine jacket water in the case of reciprocating engines, fully utilised). The test data and report are to be included as an attachment to Form CHPGO.

#### **15. Schemes With Power Loss**

Data is required based on a test carried out over a period of at least two-hours with no heat rejection (i.e. exhaust gases fully utilised). The test data and report are to be included as an attachment to Form CHPGO.

## **CHPGO-6.7**

### **PART 6 ADDENDUM**

Some additional information is required here in order to comply with parts 1 to 6 of Schedule 1 of Statutory Instrument 2007 No. 292 Energy Conservation “The Guarantees of Origin of Electricity Produced from High efficiency Cogeneration Regulations 2007”.