GUIDANCE NOTE 4

SELF-ASSESSMENT OF PERFORMANCE FOR OPERATIONAL SCHEMES

GN4.1

The annual Self-Assessment of an existing ('operational') CHP Scheme is used to ascertain the portions of its inputs, outputs and capacity that qualify as Good Quality CHP. The Self-Assessment requires:

- The period of operation on which Self-Assessment is based
- Declaration of energy inputs
- Declaration of energy outputs (power)
- Declaration of energy outputs (useful heat)
- Declaration of exported electricity and heat, where appropriate.

With this information, the self-assessment allows the:

- Calculation of CHP Scheme efficiencies
- Calculation of CHP_{QFI}, where necessary
- Calculation of Quality Index (QI)
- Calculation of CHP_{QPO}, where necessary
- Calculation of CHP_{QPC}, where necessary

The complex submission journey must be used for all Schemes with TPC >2 MW_e and for Schemes with TPC ≤2 MW_e if boilers are included, if the fuel is not a single conventional fuel or if the prime mover is not a single reciprocating engine. Otherwise the simple submission journey may be followed.

PROCEDURE

GN4.2

The declaration of performance made in the self-assessment must be completed annually for each CHP Scheme. Any major change or upgrade to the CHP Scheme, e.g. boundary changes or additional plant, must be notified within the submission, via an updated Scheme Description including, where appropriate, an updated line diagram. line diagram. This should be submitted at the same time as the Self-Assessment.

GN4.3

Following the initial (first time) submission of a self-assessment, applicants will need to resubmit each January. On this submission they will declare energies consumed and produced over the last 12-month period (January to December, inclusive), in order to establish Power Efficiency, Heat Efficiency and QI and allow a new CHPQA Certificate to be issued.

GN4.4

Schemes in the first year of Initial Operation must submit actual data for the period of operation (i.e. first month of operation to December). For CHP Schemes serving Residential Community Heating, performance on a seven-month Heating Season can be used for calculation of QI (refer to GN30), but data covering 12 months are still required for other calculations. If operated for less than 7 months, then operational data for the period of operation should be submitted.

GN4.5

Supporting Documentation Throughout the Scheme Performance section of the Operational Submission journey, various documents are requested as supporting evidence. These include, inter alia:

- Meter reading data or calculations demonstrating the derivation of fuel inputs, power outputs or heat outputs
- Calculation of estimated metering uncertainties
- Calculation of uncertainty adjustment factors
- Other supporting documents and calculations

SCHEME ENERGY INPUTS AND OUTPUTS

GN4.6

In the case of Complex Schemes, all energy inputs to and outputs from the CHP Scheme must be summarised on a monthly basis for the relevant period of operation. Note that where the uncertainty for any particular input or output exceeds the permitted level, the values recorded in this part of the submission must be before adjustment. Adjustments to account for excess uncertainties are carried out in accordance with the procedures set out in GN19. However, the values recorded in this part of the submission must, where appropriate, be corrected for bias (see GN23).

For a Simple Scheme, all energy inputs to and outputs from the CHP Scheme must be summarised on an annual basis for the relevant period of operation.

Period of Operation for Self-Assessment

GN4.7

This declares the CHP hours run and the number of consecutive months for which data are available. Normally, this will be a period of 12 calendar months starting from January of each year (see GN30). Residential Community Heating CHP Schemes can be Self-Assessed over a seven-month Heating Season, subject to meeting the conditions set out in GN30.

Energy Inputs

GN4.8

Monthly data (in MWh) are required for each fuel input to the CHP Scheme. Where relevant, this includes heat (usually steam) imported from outside the CHP Scheme boundary; as heat energy input as an equivalent fuel input (see GN14). The annual total for each fuel stream and the aggregated total annual fuel input is entered. The proportion of the total fuel inputs represented by each fuel is determined and entered

as a decimal fraction to two places (e.g. 0.31). The sum of these fractions should equal 1.00.

For a Simple Scheme, annual calendar year data (in MWh) are required for the fuel input to the CHP Scheme.

- Refer to GN13 for guidance on CHP Scheme monitoring.
- Refer to GN14 for guidance on CHP Scheme energy inputs, including a list of fuels.
- Refer to GN20 for guidance on indirect determination of energy inputs.

Responsible Persons should ensure that:

- Meter readings are identified by the meter tag number (see GN12.3) given in the Scheme details or, where determined by indirect methods, by calculation number
- All fuel calculations, where appropriate, are attached to the submission and referenced with a calculation number i.e. C1, C2, etc. Calculations must convert mass flow (kg) to energy measurement (MWh)
- All calculations to assess and, where necessary, correct bias due to errors in metering or data conversion are attached for each energy input (see GN23)
- All fuel energy inputs are identified by fuel type i.e. Gas or Coal etc. (see GN14.2 onwards for lists)
- Imported heat is included as an equivalent fuel input (see GN14.6 & 14.7)
- **All fuel energy inputs are based on gross calorific value (higher calorific value)**

For Schemes below 500 kWe where the fuel input to the CHP Scheme is not metered and the unit is listed on the CHPQA Unit List, the gas consumption can be estimated by dividing the Total Power Output (CHPTPO) by the Power Efficiency listed on the Unit List for that engine. For each unit, the Unit List displays:

- Manufacturer, Model, Engine Type,
- Total Power Capacity (equivalent to instantaneous power output)
- Qualifying Heat Capacity (equivalent to instantaneous heat output)
- Power Efficiency
- Design heat:power ratio

Responsible Persons wishing to use this route must ensure that the prime mover unit is selected from the options presented in the submission journey.

Responsible Persons should perform the following data integrity checks:

- The annual total presented at the base of each column is equal to the sum of the monthly values given in the same column.
- CHP Total Fuel Input (including all energy inputs) is equal to CHP_{TFI}=, which in turn is equal to the sum of the totals for each fuel
- The fraction of total fuel input for each fuel is equal to annual total of each

fuel / $CHP_{TFI,}$ and that the sum of all individual fuels' fractions is equal to 1.00

Power Outputs (Generated, Exported or Imported)

GN4.9

Monthly figures are required for each prime mover or group of prime movers (each generated or metered power stream) and for power exported to off-site customers or licensed suppliers.

For a Simple Scheme, annual calendar year data (in MWh) are required for the prime mover power outputs from the CHP Scheme.

- Refer to GN13 for guidance on CHP Scheme monitoring.
- Refer to GN15 for guidance on CHP Scheme power output.
- Refer to GN22 for guidance on indirect determination of mechanical power outputs.

Responsible Persons should ensure that:

- Mechanical power, where appropriate, is included and reported as equivalent electrical output (multiplying factor 1.05) and is identified by calculation number (GN15.3 to 15.5) and calculations are attached
- All calculations to assess and where necessary correct bias due to errors in metering or data conversion are attached for each power output (see GN23)
- Each meter reading is identified by meter tag number (see GN12.3) or, where determined by indirect methods, by calculation number
- All power outputs are quoted gross i.e. measured at the generator terminals
- Details of power exports should be identified in the relevant section of the submission journey, explained later

Responsible Persons should perform the following data integrity checks:

- The annual total at the base of each column is equal to the sum of the monthly values given in the same column.
- CHP Total Power Output is equal to CHP_{TPO}, which in turn is equal to the sum of the totals for all streams of power generated by the CHP Scheme.
- The annual total power exported is equal to the sum total of all the monthly data for each export meter (whether sold direct or via a licensed supplier)
- Total power imported is equal to the sum total of all power imported to the site through all import meters (note, where there are several Schemes on a site, the total power imported to the site should be the same for all Schemes)

Useful Heat Outputs

GN4.10

Useful heat is heat output that is demonstrably utilised to displace heat that would otherwise be supplied from other sources. Except in the case of Simple Schemes, it should be measured not estimated regardless of TPC. In all cases:

- Refer to GN13 for guidance on CHP Scheme Monitoring.

- Refer to GN16 for guidance on CHP Scheme Heat Outputs.
- Refer to GN21 for guidance on Indirect Determination of Energy Outputs (Heat).

- For CHP Schemes with CHP_{TPC} >2 MW_e, monthly figures are required for all heat outputs
- Each meter reading should be identified by meter tag number (See GN12.3) or, where determined by agreed indirect methods, by calculation number
- All heat output calculations are submitted with the self-assessment and referenced with a calculation number. Calculations must convert mass flow (kg) to energy measurement (MWh)
- All calculations to assess and where necessary correct bias due to errors in metering or data conversion are to be attached for each heat output (see GN23)
- Details of heat exports should be identified in the relevant section of the submission journey, detailed later

Simple Schemes with NO heat rejection facility must monitor fuel input (apart from those cases identified above using the Unit List) and power output.

A clear statement must be made in the submission that the heat output is used on site (see GN13) and an estimate of the quantity of this heat made by multiplying the Total Power Output by the design h:p ratio.

Simple Schemes WITH heat rejection facilities must monitor fuel input (apart from those cases identified above using the Unit List) and the heat and power output. CHPQA GN13 (section 13.10) and GN16 (sections 16.12 - 16.15) provide advice on how to do this.

Submissions must be based on actual heat monitored figures.

For CHP Schemes with CHP_{TPC} >2 MW_e, Responsible Persons should perform the following data integrity checks:

- The annual total at the base of each column is equal to the sum of the monthly values given in the same column.
- CHP Qualifying Heat Output, CHP_{QHO} is equal to the sum of heat supplied via each meter (or monitored supply) in each month
- Total Heat Exported is equal to the sum of all heat metered or monitored each month as supplied to other customers from the CHP Scheme

For CHP Schemes with TPC ≤2 MWe with no heat only boilers within the CHPQA Scheme boundary, it is acceptable to provide only the Annual Total of heat supplied (**based on actual heat monitoring figures**).

EXPORTS OF ELECTRICITY AND HEAT

Electricity and Heat Customers

GN4.11

Where relevant, details of non-domestic **heat** customers, and the amount of heat taken by these customers, **is** necessary for CHPQA Certification.

Details of non-domestic **electricity** customers, and the amount of electricity taken by these customers, is **not** necessary for CHPQA Certification but can be required by the Secretary of State under the Electricity Act 1989.

- Refer to GN15 for guidance on recording electricity exports.
- Refer to GN16 for guidance on recording heat exports.

