

GUIDANCE NOTE 31

CHP SCHEMES ≤ 2 MW_e

GN31.1

To the manager of a small Scheme, typically serving a hotel, Residential Community Heating or swimming pool, achieving CHPQA Certification may at first glance appear daunting. However, there are a number of things to bear in mind:

- The CHPQA programme has been designed to cope with a wide variety of Schemes, from the large and complex to the small and straightforward. Many of the Guidance Notes and some of the submission journey will not apply to Schemes ≤ 2 MW_e.
- Only three sets of data are needed to determine whether a Scheme is 'Good Quality', and therefore eligible for benefits: fuel used, electricity generated and heat supplied.
- There is a simplified submission journey for reciprocating engine-based CHP Schemes that:
 1. have a Total Power Capacity (TPC) ≤ 2 MW_e
 2. use only a single conventional fuel e.g. natural gas, diesel
 3. only include a single reciprocating engine CHP package, together with associated heat recovery equipment, within the Scheme boundary
 4. do not include any fired (including fired part of combination) boilers
- Should data not be available, the first call should be to your energy services company (the company that sold the unit, or maintains it, or owns the unit and sells the electricity at a discounted rate). It may hold much of the data needed to complete an assessment and will be able to help where metering arrangements are not yet adequate.

GN31.2

A few documents will help applicants complete the Self-assessment submission.

- If there was a feasibility study or design statement produced when the Scheme was installed this will help enormously. It may already include a site schematic (though applicants will need to add information about metering arrangements). It may also include a site heat profile (both daily and annual) which is needed for submission, and detailed specification of the Scheme. It will help applicants to complete a submission. Either your site or your energy services company should have these details.
- Regular statements for electricity generated from the Scheme.
- Regular statements of the gas (and other fuel) bills for the site.

GN31.3

You should check whether your CHP Scheme has:

- A gas meter (or metering for other fuels) which is separate from the supply to the rest of the site. If your Scheme does not have a separate gas (or other)

meter, it will need one before a submission can be completed. For Schemes $\leq 500 \text{ kW}_e$ where the fuel input to the CHP Scheme is not metered, the gas consumption can be estimated by dividing the Total Power Output (CHP_{TPO}) by the Power Efficiency of the CHP unit upon which the Scheme is based. The Power Efficiency of the CHP unit must be obtained from the CHPQA Unit List or manufacturer (this figure may be reviewed and agreed between the CHPQA Administrator and the manufacturer). The CHP unit upon which the Scheme is based must also be listed on the CHPQA Unit List. Responsible Persons wishing to use this route must ensure that the Model number entered on in the Scheme Details section of the submission is one currently displayed on the CHPQA Unit List.

- An electricity meter to meter the output from the CHP Scheme. Again, if your Scheme doesn't have one, it will need one before a submission can be completed. Normally the meter should measure the gross output from the generator, measured at the generator terminals. Many small Schemes measure output net of electricity used within the Scheme. This is acceptable, but applicants should be aware that this is not as favorable for the assessment of the Scheme as measuring gross generation. For many small Schemes, however, the small difference should not affect whether the Scheme qualifies as 'Good Quality'.
- A heat rejection facility. If the Scheme is a single reciprocating engine and has no heat rejection facility, completing CHPQA will be straightforward (see GN13.2). If the Scheme does have a heat rejection facility, or does not have a reciprocating engine, the heat supplied to the site from the Scheme must be monitored (see GN13) and you need to discuss with your energy services company how to do this, if you haven't already done so. Whilst reciprocating engines may have a heat rejection radiator or other facility, small gas turbines may simply vent the exhaust gases to a stack, bypassing the heat recovery system. There are acceptable metering uncertainties that apply to each of these meters (See GN14, 15 and 16). You should discuss these issues with your energy services company.

GN31.4

Once all the above information is available, the next step is a preliminary assessment of your Scheme against the threshold criterion. Most Schemes $\leq 2 \text{ MW}_e$ will be natural gas fired reciprocating engines, and if 1 MW_e or less, use a QI formula of $\text{QI} = 249 \times \text{Power efficiency} + 113 \times \text{Heat efficiency}$. Most reciprocating engines have an electrical efficiency of 25 - 34% and consequently will exceed the minimum power efficiency threshold with ease. If a Scheme has no heat rejection capability it can typically recover up to around half the fuel input as heat. Thus, QI could be $249 \times 0.30 + 113 \times 0.45$ or around 125.

GN31.5

Many Schemes $\leq 2 \text{ MW}_e$ may serve a significant number of domestic customers and qualify as serving Residential Community Heating (see GN30.3). If the Scheme in question does, and heat demand is, as a consequence, highly seasonal, applicants may wish to take advantage of an assessment of heat load over seven months of the heating season rather than twelve. However, it may be simpler, at least in the first instance, for Schemes $\leq 2 \text{ MW}_e$ NOT to apply as a Residential Community Heating

Scheme.

GN31.6

Many Schemes ≤ 2 MW_e may also have adjacent back- up boilers. It may be that an initial appraisal of the Scheme's electrical and thermal efficiency shows that a Scheme could include additional adjacent boiler plant within the definition of the Scheme and still achieve the relevant thresholds. However, a Scheme would have to be able to meter the new Scheme boundary, and determine the total fuel consumed and total heat supplied and where necessary calculate CHP_{QFI}, CHP_{QPO}, and CHP_{QPC}. Applicants may conclude that in the first instance, they should keep to a simple system definition and take advantage of simpler arrangements for describing heat supplied. In later years, with more experience of CHPQA, and more metering in place, a wider Scheme boundary could be considered which includes back-up and top-up boilers.

GN31.7 You might want to explore some of these options in discussion with your energy services company. Once you have assessed these options against a preliminary assessment, the next step is a more complete self-assessment using the CHPQA submission journey.