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CHP QA

Principles and Procedures

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CHPQA

Department of Energy & Climate Change

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Talk Coverage

- Quick Review
  - Principles
  - Roles & Responsibilities
  - Certificates
- CHPQA Procedures

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Why CHPQA?

- It is a tool for measuring the Quality of CHP Schemes
- A rigorous system is needed to:
  - ensure that incentives are targeted fairly
  - ensure that it only benefits schemes making significant environmental savings
- CHPQA provides the **methods** and **procedures** needed to assess and certify the quality of the full range of CHP Schemes

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Definition of GQCHP

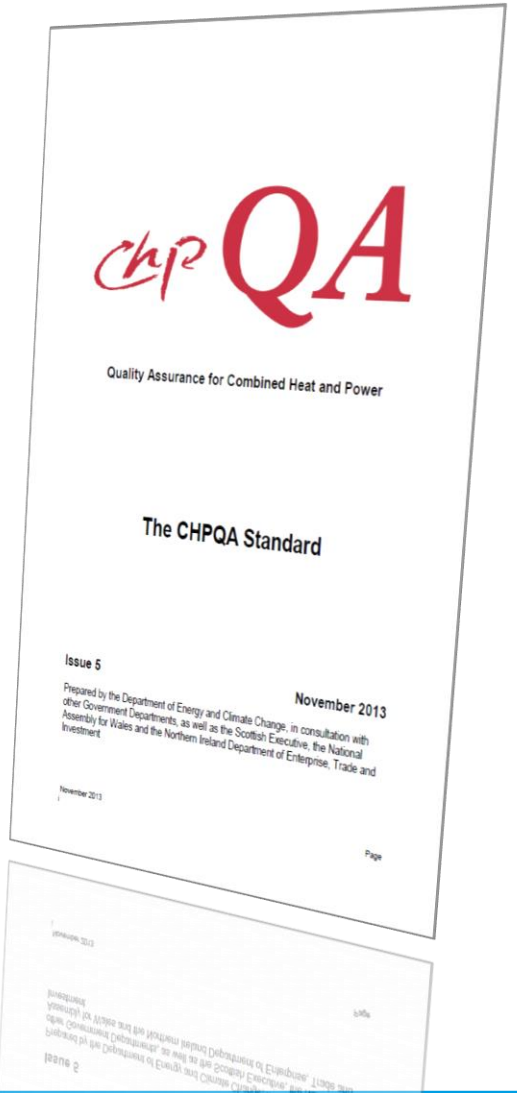
All laid out in the CHPQA Standard.

<u>For Existing Schemes:</u>

- **Quality Index (QI) ≥100 and**
- **Power generation efficiency of ≥ 20%**

<u>For Upgraded & New Schemes</u>:

- **Quality Index (QI) ≥105 and**
- **Power generation efficiency of ≥ 20%.**



See Issue 5 - Published Nov 2013

See also CHPQA Guidance Note 44 with regard to ROCs and CfD support (Issue 4-ROCs & Issue 5-CfD)

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CHPQA QI Formulas

The general definition for QI is:

$$QI = (X \times \eta_{power}) + (Y \times \eta_{heat})$$

Where:

Power Efficiency (η_{power}) = CHP_{TPO}/CHP_{TFI}

and

Heat Efficiency (η_{heat}) = CHP_{QHO}/CHP_{TFI}

X and Y are parameters which depend on the type of fuel used and size of scheme (MW_e)

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CHPQA Standard (Issue 5) QI Formulae– For Conventional & Alternative Fuels

Size Of Scheme (CHP_{TPC})	QI Definition
CONVENTIONAL FOSSIL FUELS SCHEMES	
Natural gas (inc. Reciprocating Engines)	
≤1MWe	QI = 249 x η_{power} + 115 x η_{heat}
>1 to ≤10MWe	QI = 195 x η_{power} + 115 x η_{heat}
>10 to ≤25MWe	QI = 191 x η_{power} + 115 x η_{heat}
>25 to ≤50MWe	QI = 186 x η_{power} + 115 x η_{heat}
>50 to ≤100MWe	QI = 179 x η_{power} + 115 x η_{heat}
>100 to ≤200MWe	QI = 176 x η_{power} + 115 x η_{heat}
>200 to ≤500MWe	QI = 173 x η_{power} + 115 x η_{heat}
>500MWe	QI = 172 x η_{power} + 115 x η_{heat}
Oil	
≤1MWe	QI = 249 x η_{power} + 115 x η_{heat}
>1 to ≤25MWe	QI = 191 x η_{power} + 115 x η_{heat}
>25MWe	QI = 176 x η_{power} + 115 x η_{heat}
Coal	
≤1MWe	QI = 249 x η_{power} + 115 x η_{heat}
>1 to ≤25MWe	QI = 191 x η_{power} + 115 x η_{heat}
>25MWe	QI = 176 x η_{power} + 115 x η_{heat}

Issue 5 of the standard formulae applied from 1st January 2014 and was used for the 2015 certification of all schemes

SPECIAL CASES							
FUEL CELL SCHEMES	QI =	180 x	η_{power}	+	120	x	η_{heat}
ALTERNATIVE FUEL SCHEMES							
Category A (e.g. AD gas, sewage gas, landfill gas)							
≤1MWe	QI =	238 x	η_{power}	+	120	x	η_{heat}
>1 to ≤25MWe	QI =	225 x	η_{power}	+	120	x	η_{heat}
>25MWe	QI =	193 x	η_{power}	+	120	x	η_{heat}
Category B (e.g. synthesis gas)							
≤1MWe	QI =	275 x	η_{power}	+	120	x	η_{heat}
>1 to ≤25MWe	QI =	251 x	η_{power}	+	120	x	η_{heat}
>25MWe	QI =	193 x	η_{power}	+	120	x	η_{heat}
Category C e.g. Fatty Acid Methyl Ester, Pyrolysis oil etc.)							
≤1MWe	QI =	245 x	η_{power}	+	120	x	η_{heat}
>1 to ≤25MWe	QI =	191 x	η_{power}	+	120	x	η_{heat}
>25MWe	QI =	176 x	η_{power}	+	120	x	η_{heat}
Category D (e.g. Tallow, Used Cooking Oil)							
<=1MWe	QI =	245 x	η_{power}	+	120	x	η_{heat}
>1 to ≤25MWe	QI =	226 x	η_{power}	+	120	x	η_{heat}
>25MWe	QI =	176 x	η_{power}	+	120	x	η_{heat}
Category E (e.g. Municipal waste, sewage sludge, paper sludge etc.)							
≤1MWe	QI =	370 x	η_{power}	+	120	x	η_{heat}
>1 to ≤10MWe	QI =	370 x	η_{power}	+	120	x	η_{heat}
>10 to ≤25MWe	QI =	370 x	η_{power}	+	120	x	η_{heat}
>25MWe	QI =	220 x	η_{power}	+	120	x	η_{heat}
Category F (e.g. Logs, Energy crops, Agricultural residues etc.)							
≤1MWe	QI =	348 x	η_{power}	+	130	x	η_{heat}
>1 to ≤10MWe	QI =	348 x	η_{power}	+	130	x	η_{heat}
>10 to ≤25MWe	QI =	348 x	η_{power}	+	130	x	η_{heat}
>25MWe	QI =	220 x	η_{power}	+	120	x	η_{heat}
Category G (e.g. Contaminated waste wood)							
≤1MWe	QI =	352 x	η_{power}	+	120	x	η_{heat}
>1 to ≤10MWe	QI =	338 x	η_{power}	+	120	x	η_{heat}
>10 to ≤25MWe	QI =	338 x	η_{power}	+	120	x	η_{heat}
>25MWe	QI =	220 x	η_{power}	+	120	x	η_{heat}
Category H (e.g. Wood pellets, straw, clean waste wood etc.)							
≤1MWe	QI =	329 x	η_{power}	+	120	x	η_{heat}
>1 to ≤10MWe	QI =	293 x	η_{power}	+	120	x	η_{heat}
>10 to ≤25MWe	QI =	286 x	η_{power}	+	120	x	η_{heat}
>25MWe	QI =	220 x	η_{power}	+	120	x	η_{heat}
Category I (e.g. by-product gases produced in industrial processes)							
≤1MWe	QI =	294 x	η_{power}	+	120	x	η_{heat}
>1 to ≤25MWe	QI =	221 x	η_{power}	+	120	x	η_{heat}
>25MWe	QI =	193 x	η_{power}	+	120	x	η_{heat}
Category J (e.g. waste gases such as carbon monoxide, or waste heat such as the exhaust gas from high temperature processes, or as a product of exothermic chemical reactions).							
≤1MWe	QI =	329 x	η_{power}	+	120	x	η_{heat}
>1 to ≤25MWe	QI =	299 x	η_{power}	+	120	x	η_{heat}
>25MWe	QI =	193 x	η_{power}	+	120	x	η_{heat}
Category K (e.g. liquid waste-non renewable)							
≤1MWe	QI =	275 x	η_{power}	+	120	x	η_{heat}
>1 to ≤25MWe	QI =	260 x	η_{power}	+	120	x	η_{heat}
>25MWe	QI =	176 x	η_{power}	+	120	x	η_{heat}

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QI Definitions for Existing and New Schemes

In summary

- All Schemes wishing to obtain a 'Regular' CHPQA Certificate must use QI formulae in Table 1 of the current CHPQA Standard for 2016 submission.
- Based on 2015 performance data
- See CHPQA Standard Issue 5

Note: For appropriate QI formulae when seeking CHPQA 'GN44' certification for the purposes of ROCs and CfDs, see Guidance Note 44 (Issue 4-ROCs & Issue 5-CfD)

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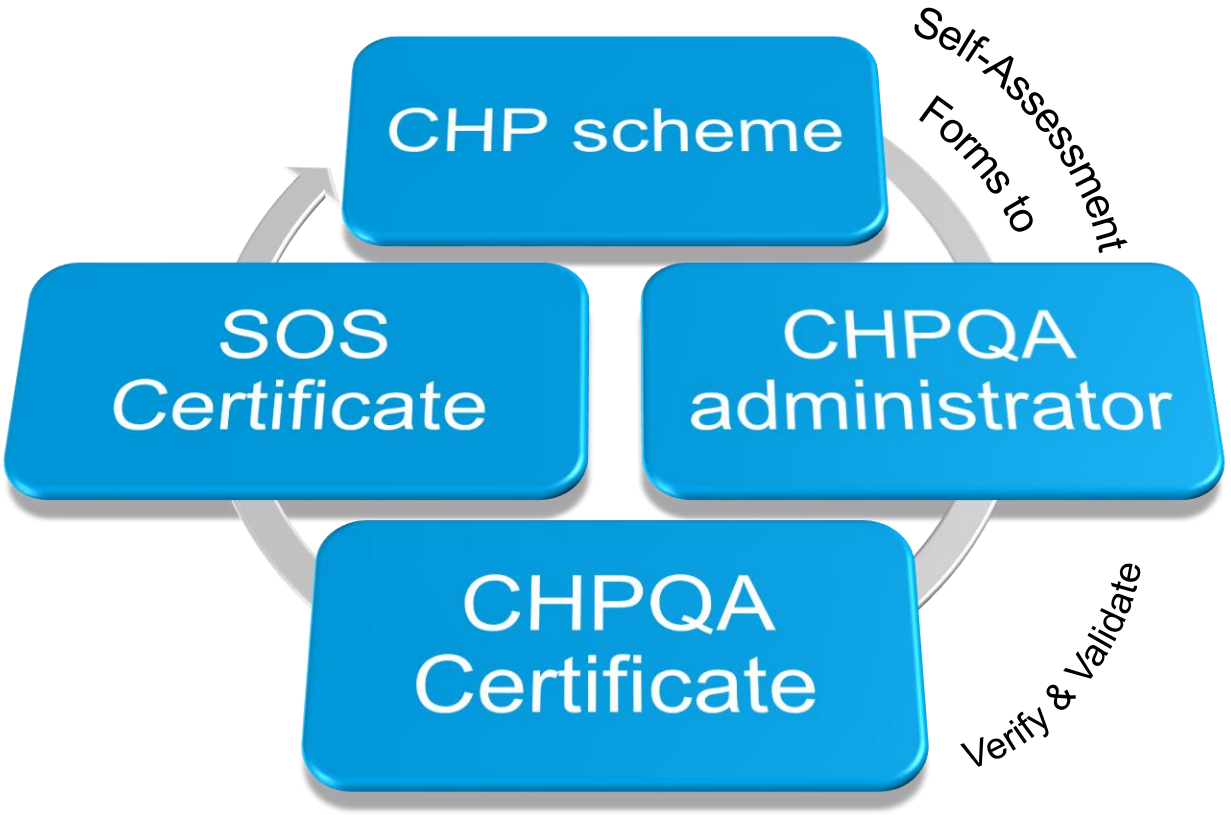
Self Assessment & Certification



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Roles and Responsibilities

- CHPQA Administrator/Managed by Ricardo Energy & Environment
- DECC
- Other Government Departments (HMRC, VOA)
- Ofgem - for issuing ROCs, RHI
- Low Carbon Contracts Company – CfD contracts.

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CHPQA Submission

- **A range of forms have been developed :**
  - F1 (contact details);
  - F2 (scheme description);
  - F4 (scheme actual performance in previous calendar year) and
  - F3 (scheme predicted performance for new and upgraded schemes).
- **Simplified procedure and forms for small single reciprocating engine based schemes (<2MW$_e$).**
  - Only have to provide three figures per year**.**

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CHPQA Forms

CHPQA Forms to be submitted:

- **F1**...only if RP or company name has changed
- **F2 and F2(S)..**only if Scheme boundaries or monitoring arrangement have changed
- **F4 & F4(S)** annual submission using actual performance data
- **F3 & F3(S)** annual submission using design data. If no change …. Submit the same form… Once a new or upgraded Scheme has at least 1 month of data in CHP mode, Form F4 or F4(S) must be submitted in the first January of Initial Operation.

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Short Forms for <2MW$_e$ CHP Schemes

- **Schemes eligible to use short forms:**
  - Reciprocating Engine Prime Mover
  - Less than 2MW$_e$ Total Power Capacity
  - Only a single conventional fuel
  - Only include a single prime mover,
  - No heat only boilers
- **F2(S) > 2 pages**
- **F3(S) > 4 pages**
- **F4(S) > 4 pages**

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Simplified Arrangements for Schemes with TPC<500kW$_e$

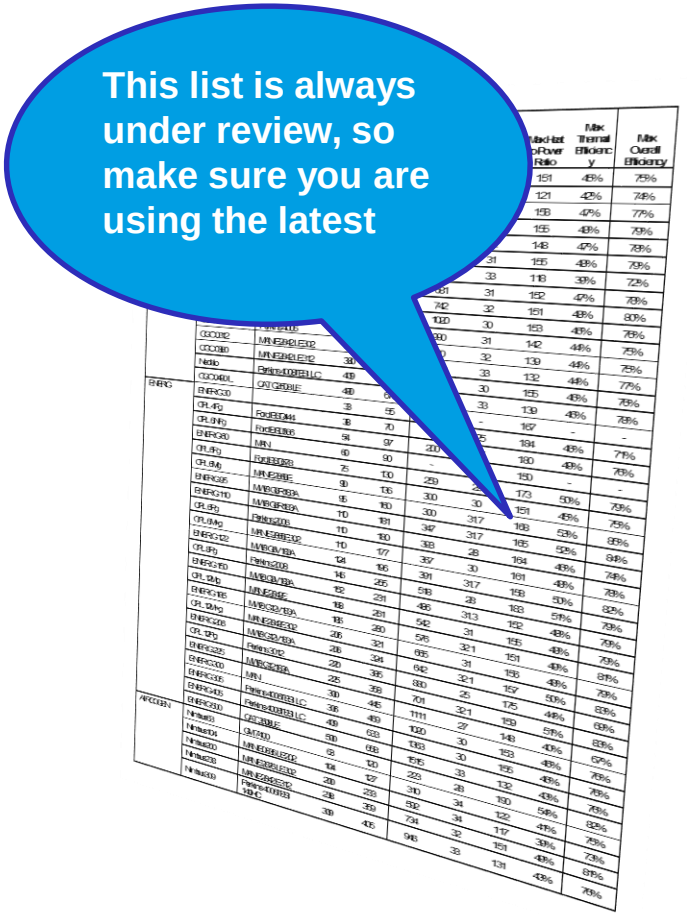
Simple small CHP schemes can use the CHPQA Unit List to determine:

- Gas input (based on power efficiency) and
- Heat output (based on heat-to-power ratio)

Only CHP units meeting the following criteria:

- CHP Scheme with TPC <500kWe,
- Only include a single prime mover,
- Using Natural Gas fired engines
- No facility to dumping heat,

*Make sure that the **engine spec** used from Unit List matches the details on your F2*



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CHPQA Submission

- Electronic submission is now used for ~97% of all submissions.
- Paper forms in PDF are available to download from the website.

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Certification Timetable

- CHPQA Certificates cover a **calendar year** and expire at the end of December
- SoS (CHP Exemption) certificates are **open-ended…**
- …provided that a valid CHPQA certificate is obtained **no later than end of June every year**
- ***To obtain an SoS certificate need to make sure you select the correct option***

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Where do you go from here?

- All CHPQA Certificates issued in 2015 will expire on 31st of December 2015

- **New applications should be submitted to the CHPQA Administrator between 1st January and 31st March 2016**
- **Based on 2015 actual data:**
  - Fuel used
  - Electricity generated
  - Heat utilised (actual)
- **If all is in order new certificate (based on 2015 data) will be issued before the end of June 2016**