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CHP QA

Benefits and Procedures

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Department of Energy & Climate Change

CHP QA

Talk Coverage

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

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Fiscal Measures and GQCHP

Existing measures:

- CCL Exemption (on fuel input and electricity output)
- Business Rates Exemption (embedded schemes)
- Hydrocarbon Oil Duty Relief
- CRC–no emissions attributed to heat from CHP (**Zero Carbon Heat**)
- Carbon Allocation for Heat under EU-ETS
- Enhanced Capital Allowance
- 1ROC/MWh of electricity from EfW, 2 ROCs/MWh for dedicated biomass (April 2009)
- CPS – exemptions for supplies of fossil fuels to CHP where the fuel is used to generate heat (fuel for heat equivalent)

New measures:

- RHI-Proposal to provide specific tariffs for biomass & bioliquid fuelled GQCHP

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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

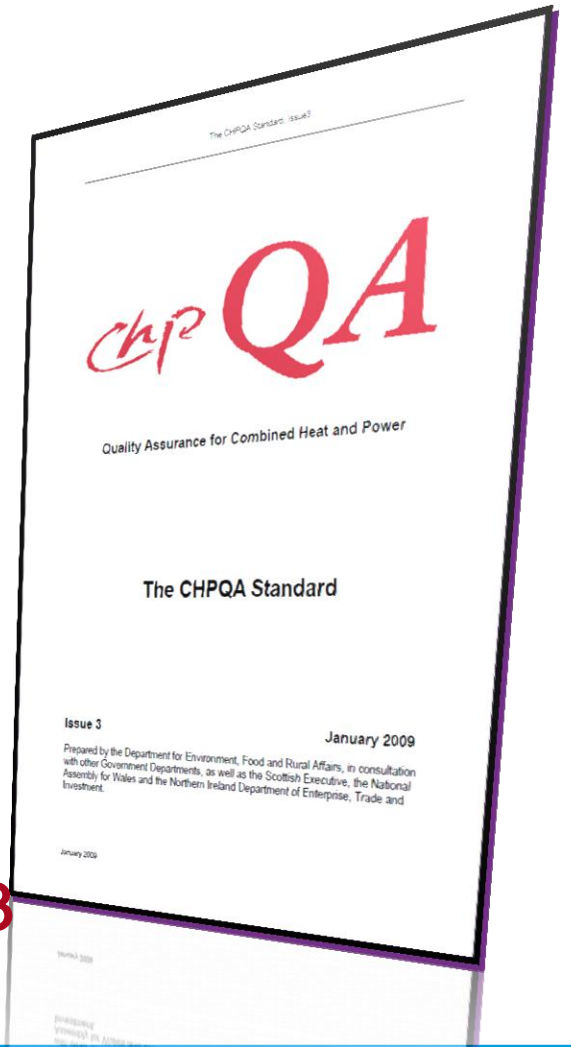
All laid out in the CHPQA Standard.

<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 3 - Published Jan 2009

Issue 5 is due to be published in Dec 2013

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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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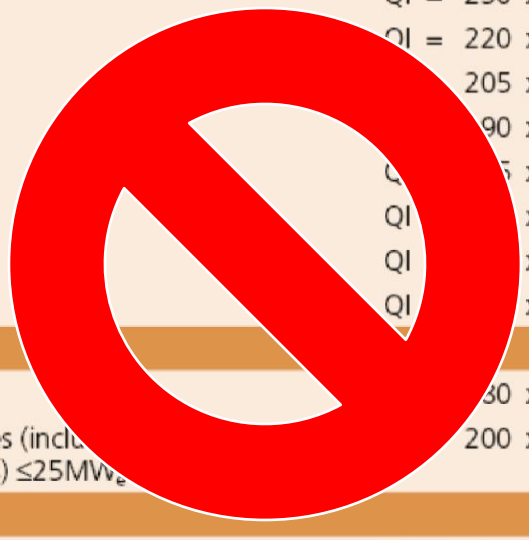
QI Formulae for Schemes Registered before Jan '07

Size of Scheme (CHP_{TPC})	QI Definition
≤1MW_e	$QI = 230 \times \eta_{power} + 125 \times \eta_{heat}$
>1 to ≤10MW_e	$QI = 220 \times \eta_{power} + 125 \times \eta_{heat}$
>10 to ≤25MW_e	$205 \times \eta_{power} + 125 \times \eta_{heat}$
>25 to ≤50MW_e	$90 \times \eta_{power} + 125 \times \eta_{heat}$
>50 to ≤100MW_e	$5 \times \eta_{power} + 125 \times \eta_{heat}$
>100 to ≤200MW_e	QI $\times \eta_{power} + 125 \times \eta_{heat}$
>200 to ≤500MW_e	QI $\times \eta_{power} + 125 \times \eta_{heat}$
>500MW_e	QI $\times \eta_{power} + 125 \times \eta_{heat}$
Special Cases	**QI Definition**
Fuel Cell Schemes	$30 \times \eta_{power} + 125 \times \eta_{heat}$
Reciprocating Engine Schemes (incl… Combined Cycle Applications) ≤25MW_e	$200 \times \eta_{power} + 125 \times \eta_{heat}$
Alternative Fuel Schemes[1]	
Alternative Fuel Gases[2]	QI $= 240 \times \eta_{power} + 125 \times \eta_{heat}$
Biogas, Waste gas or Waste heat	$QI = 300 \times \eta_{power} + 140 \times \eta_{heat}$
Biomass or solid or liquid Waste	$QI = 400 \times \eta_{power} + 140 \times \eta_{heat}$



No longer used

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QI Formulae for ALL Schemes – For Conventional Fuels

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

As of Jan 2011, all existing CHPQA schemes (regardless of CHPQA registration date) should be using the new X & Y values listed on page 19 of the CHPQA Standard (same as Table GN10-2)

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QI Formulae for ALL Schemes – For Alternative Fuels

New X & Y values are also available for all existing schemes using alternative fuels

These new X & Y values must be used for 2013 operational data (i.e. 2014 submissions)

Size Of Scheme (CHP_{TPC})	QI Definition
ALTERNATIVE FUEL SCHEMES[3]	
By-Product Gases	
≤1MWe	$QI = 294 \times \eta_{power} + 120 \times \eta_{heat}$
>1 to ≤25MWe	$QI = 221 \times \eta_{power} + 120 \times \eta_{heat}$
>25MWe	$QI = 193 \times \eta_{power} + 120 \times \eta_{heat}$
Biogas	
<=1MWe	$QI = 285 \times \eta_{power} + 120 \times \eta_{heat}$
>1 to ≤25MWe	$QI = 251 \times \eta_{power} + 120 \times \eta_{heat}$
>25MWe	$QI = 193 \times \eta_{power} + 120 \times \eta_{heat}$
Waste Gas or Heat	
≤1MWe	$QI = 329 \times \eta_{power} + 120 \times \eta_{heat}$
>1 to ≤25MWe	$QI = 299 \times \eta_{power} + 120 \times \eta_{heat}$
>25MWe	$QI = 193 \times \eta_{power} + 120 \times \eta_{heat}$
Liquid Biofuels	
≤1MWe	$QI = 275 \times \eta_{power} + 120 \times \eta_{heat}$
>1 to ≤25MWe	$QI = 191 \times \eta_{power} + 120 \times \eta_{heat}$
>25MWe	$QI = 176 \times \eta_{power} + 120 \times \eta_{heat}$
Liquid Waste	
≤1MWe	$QI = 275 \times \eta_{power} + 120 \times \eta_{heat}$
>1 to ≤25MWe	$QI = 260 \times \eta_{power} + 120 \times \eta_{heat}$
>25MWe	$QI = 176 \times \eta_{power} + 120 \times \eta_{heat}$
Biomass or Solid Waste	
≤1MWe	$QI = 370 \times \eta_{power} + 120 \times \eta_{heat}$
>1 to ≤25MWe	$QI = 370 \times \eta_{power} + 120 \times \eta_{heat}$
>25MWe	$QI = 220 \times \eta_{power} + 120 \times \eta_{heat}$
Wood Fuels	
≤1MWe	$QI = 329 \times \eta_{power} + 120 \times \eta_{heat}$
>1 to ≤25MWe	$QI = 279 \times \eta_{power} + 120 \times \eta_{heat}$
>25MWe	$QI = 220 \times \eta_{power} + 120 \times \eta_{heat}$

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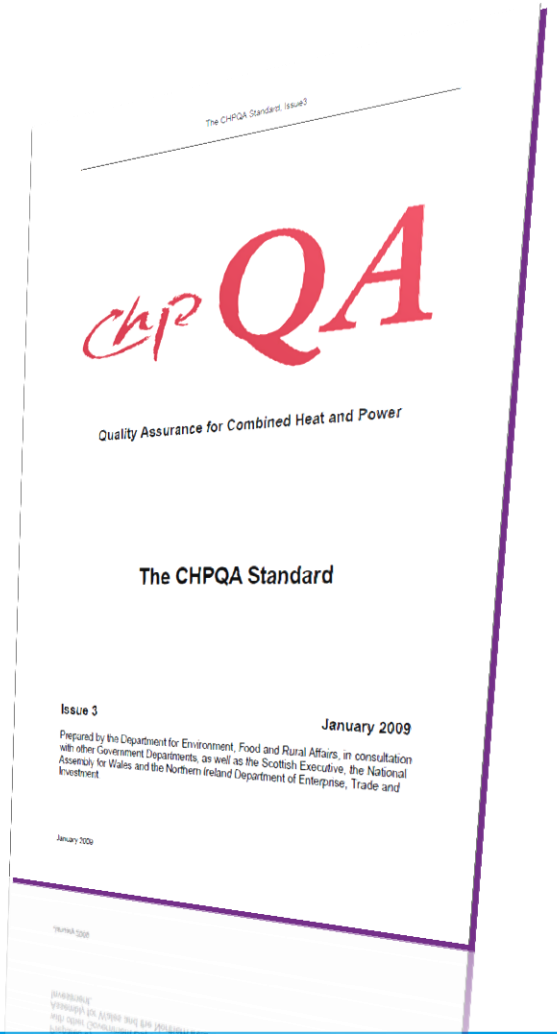
QI Definitions for Existing and New Schemes

- In summary
  - QI formulae in Table 1 of the CHPQA Standard (page 18) are no longer in use.
  - ‘ ALL Schemes’, must use QI formulae in Table 2 for 2014 submission.
  - Based on 2013 performance data
  - See CHPQA Standard Issue 3



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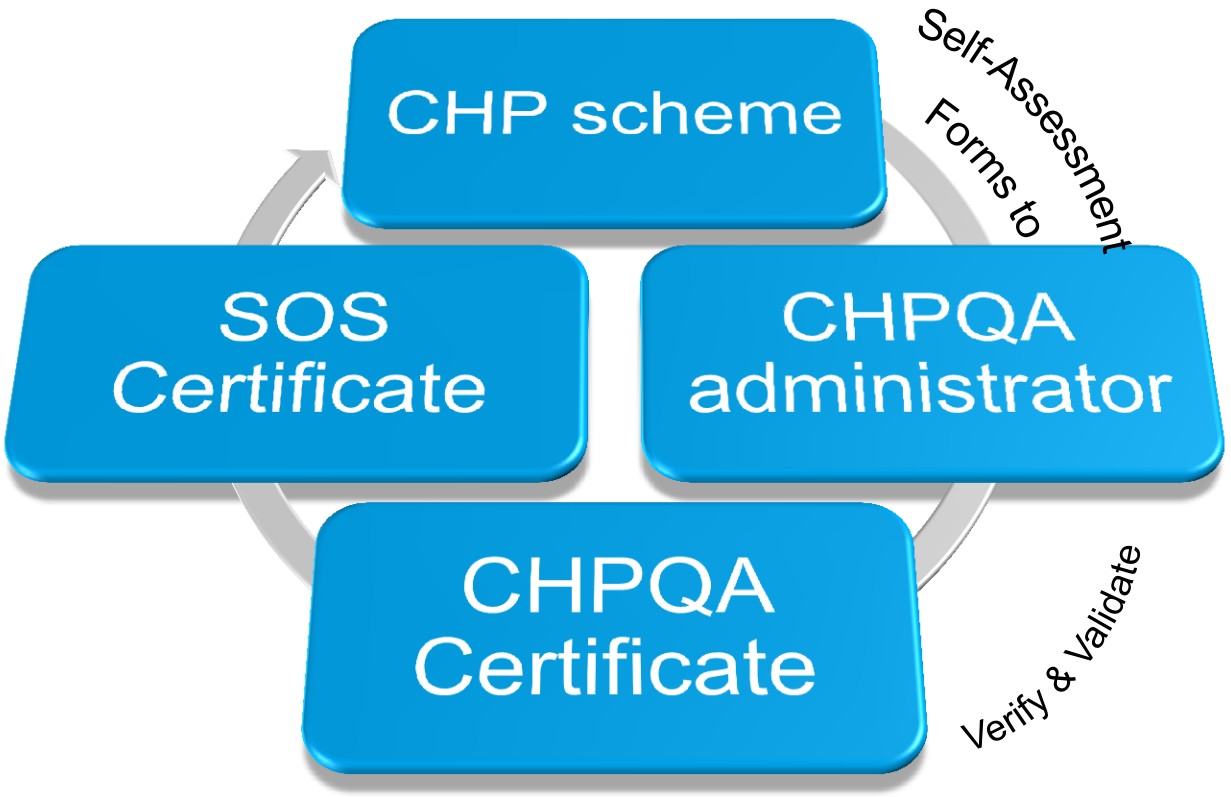
Self Assessment & Certification



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Roles and Responsibilities

- CHPQA Administrator/Managed by Ricardo-AEA
- DECC
- Other Government Departments (HMRC, VOA)
- Ofgem and NIAUR (Northern Ireland Authority for Utility Regulation) - for issuing LECs…..LECs system closed in April 2013.

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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 in IO then F4 or F4(S)

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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 details on your F2*

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CHPQA Submission

- Paper forms available to download as both Microsoft Word or PDF

- Electronic submission available (See presentation on ‘CHPQA Electronic Submissions and Forms’).

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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**
- ***SoS pro-forma was discontinued at end of 2012 and replaced by new section at end of self-assessment form (see Q13 in the form)…..***
- ***Make sure you select the correct option***

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Where do you go from here?

- All CHPQA Certificates issued in 2013 will expire on 31st of December 2013
- SOS certificates are open ended…
- …entitling Schemes to continue claiming exemption,
- provided that a valid CHPQA certificate is obtained by the end of June 2014

- **New applications should be submitted to the CHPQA Administrator between 1st January and 31st March 2014**
- **Based on 2013 actual data:**
  - Electricity generated
  - Heat utilised (actual)
  - Fuel used
- **If all is in order new certificate will be issued no later than middle of June**

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Certification Status (2002-2013)

Year	Number of Schemes	CHP_{TPC} (MW_e)	CHP_{QPC} (MW_e)
2002	892	8,016	4,778
2003	897	8,367	5,072
2004	899	8,321	5,056
2005	899	8,871	5,671
2006	950	9,214	5,813
2007	938	9,072	5,693
2008	931	10,744	6,684
2009	1053	11,775	7,013
2010	1132	12,539	7,610
2011	1232	12,394	8,336
2012	1387	12,221	9,660
2013	1331	12,273	8,550

We are expecting a large number of submissions in 2014 ;
so submit as soon as possible but no later than end of March 2014