

chip QA

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defra
Department for Environment
Food and Rural Affairs

An Introduction to the CHPQA Programme

Mahmoud Abu-Ebid
CHPQA Programme Manager
on behalf of Defra



Talk Coverage

- Background
- Forms and procedures
- CHPQA Website
- Heat Monitoring Requirements
- Other Issues



Why was CHPQA needed?

- Under the Climate Change programme CHP is exempt from CCL
- A rigorous system was needed to:
 - ensure incentives are targeted fairly
 - only benefit Schemes making significant environmental savings
- The CHPQA Programme was introduced in 2000 following extensive consultation with Industry.
- CHPQA provides the **methods** and **procedures** needed to assess and certify the quality of the full range of CHP Schemes
- It is designed to ensure that schemes that are certified annually as 'Good Quality' deliver **primary energy savings** and have access to a range of fiscal benefits

‘Good Quality’ CHP Threshold Criteria

For Existing Schemes:

- Quality Index (QI) ≥ 100 and
- Power generation efficiency of $\geq 20\%$

For New Schemes:

- Quality Index (QI) ≥ 105 and
- Power generation efficiency of $\geq 20\%$
- For new schemes in Initial Operation period
QI ≥ 95



CHPQA QI Formulas

General form:

$$QI = X * \text{Power efficiency} + Y * \text{Heat efficiency}$$

Where X=power factor and Y=heat factor

- X generally ranges from 160-230 dependant on CHP technology and size
- Y=125
- Alternative fuels have X value of 300-400 and Y value of 140
- *These will have to be changed to Comply with the EU-CHP Directive See full presentation*

Current QI definition

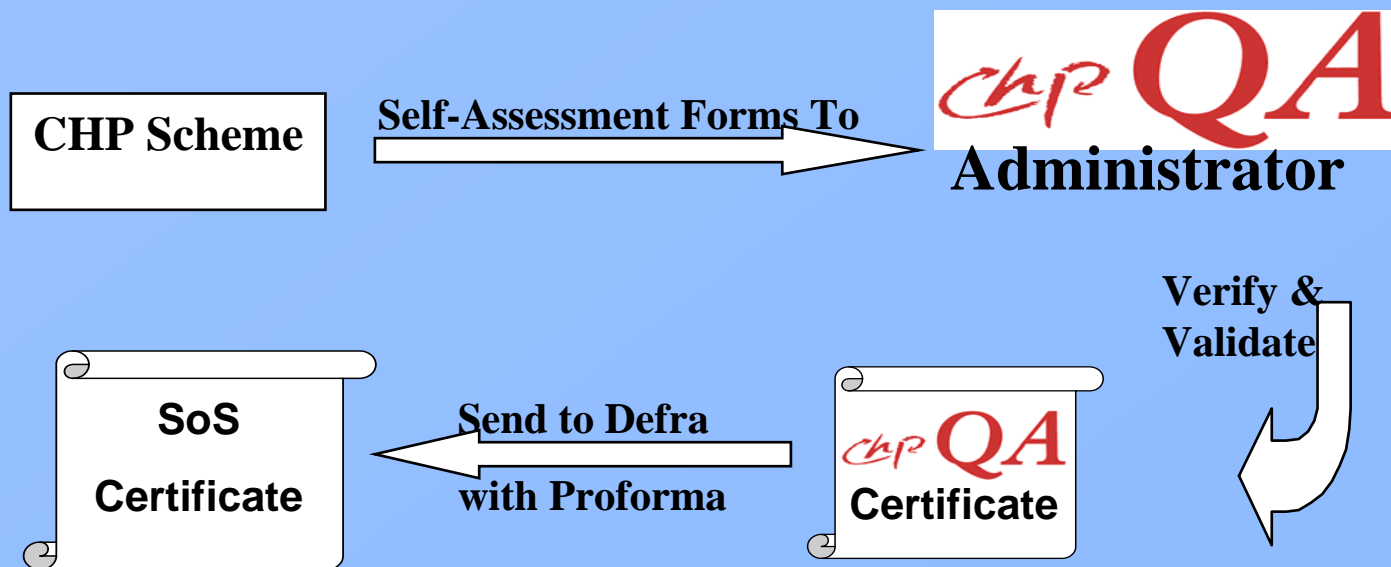
The general fom	QI=	X	Efficiency _{power}	+	Y	Efficiency _{heat}	
Combined Cycle Gas Turbine, Simple Cycle Gas Turbine or new Steam Turbine							
≤ 1 MWe	QI=	230	Efficiency _{power}	+	125	Efficiency _{heat}	
> 1 - ≤ 10 MWe	QI=	220	Efficiency _{power}	+	125	Efficiency _{heat}	
> 10 - ≤ 25 MWe	QI=	205	Efficiency _{power}	+	125	Efficiency _{heat}	
> 25 - ≤ 50 MWe	QI=	190	Efficiency _{power}	+	125	Efficiency _{heat}	
> 50 - ≤ 100 MWe	QI=	185	Efficiency _{power}	+	125	Efficiency _{heat}	
> 100 - ≤ 200 MWe	QI=	180	Efficiency _{power}	+	125	Efficiency _{heat}	
> 200 to ≤ 500 MWe	QI=	170	Efficiency _{power}	+	125	Efficiency _{heat}	
> 500 MWe	QI=	160	Efficiency _{power}	+	125	Efficiency _{heat}	
Reciprocating Engines							
All sizes	QI=	200	Efficiency _{power}	+	125	Efficiency _{heat}	
Transitional arrangements for existing Steam Turbines to April 2005							
All sizes	QI=	240	Efficiency _{power}	+	125	Efficiency _{heat}	
Alternative fuels with any prime mover							
Biogas, waste gas or waste heat	QI=	300	Efficiency _{power}	+	140	Efficiency _{heat}	
Biomass or solid or liquid Waste	QI=	400	Efficiency _{power}	+	140	Efficiency _{heat}	



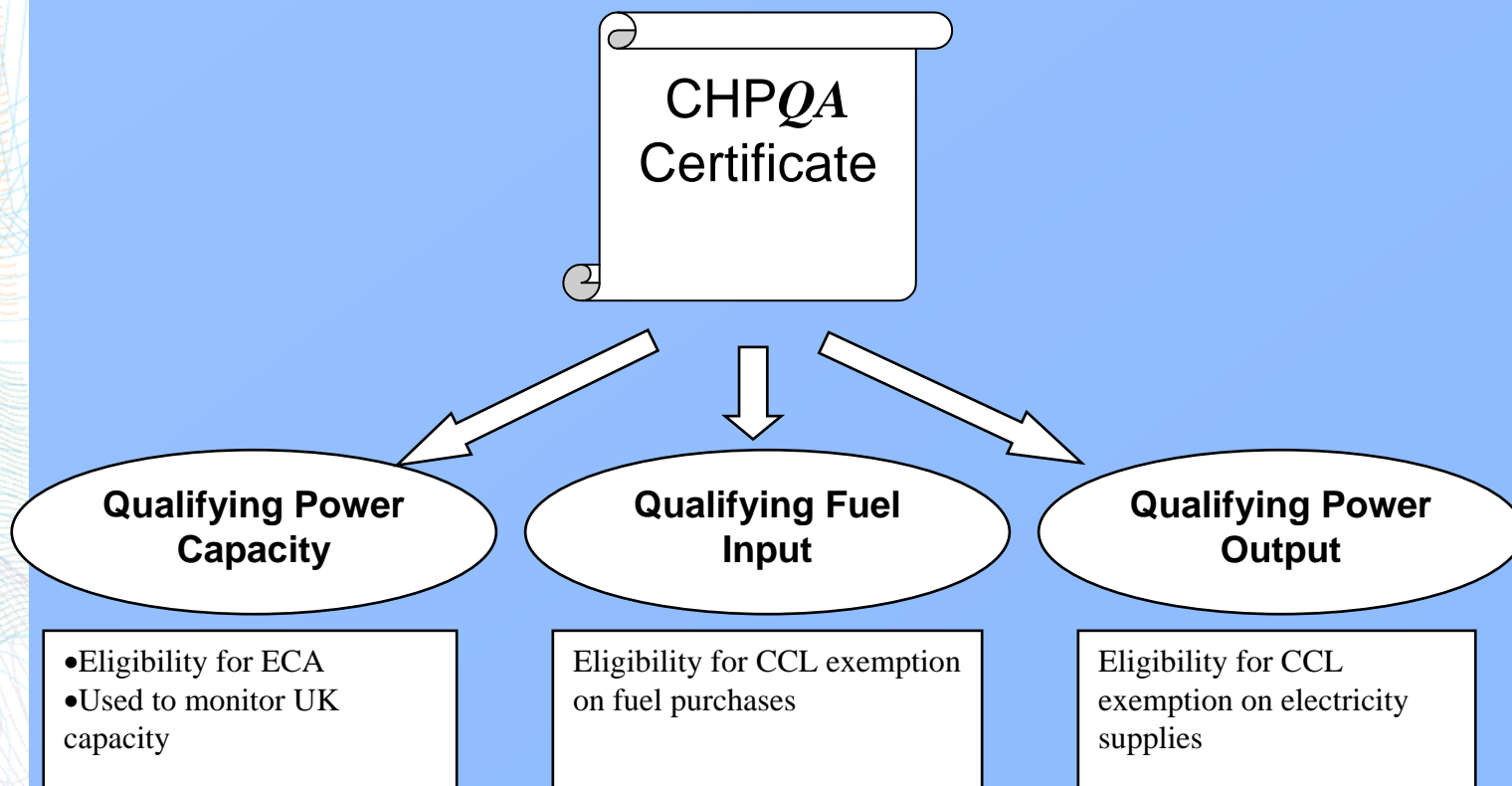
Current Benefits for Good Quality CHP

- CCL Exemption on **both fuel input and electricity output**
- Business Rates Exemption
- Access to Enhanced Capital Allowance
- ROCs for Waste-to-Energy CHP- (*New Benefit from 1 April 2006*)
- Hydrocarbon Oil Duty Relief (*New Benefit from Jan 2006*)
- Creation of CHP sector under EU-ETS Phase II - NAP (with higher allocation ratio).

Self-assessment and Certification



CHPQA Certificate

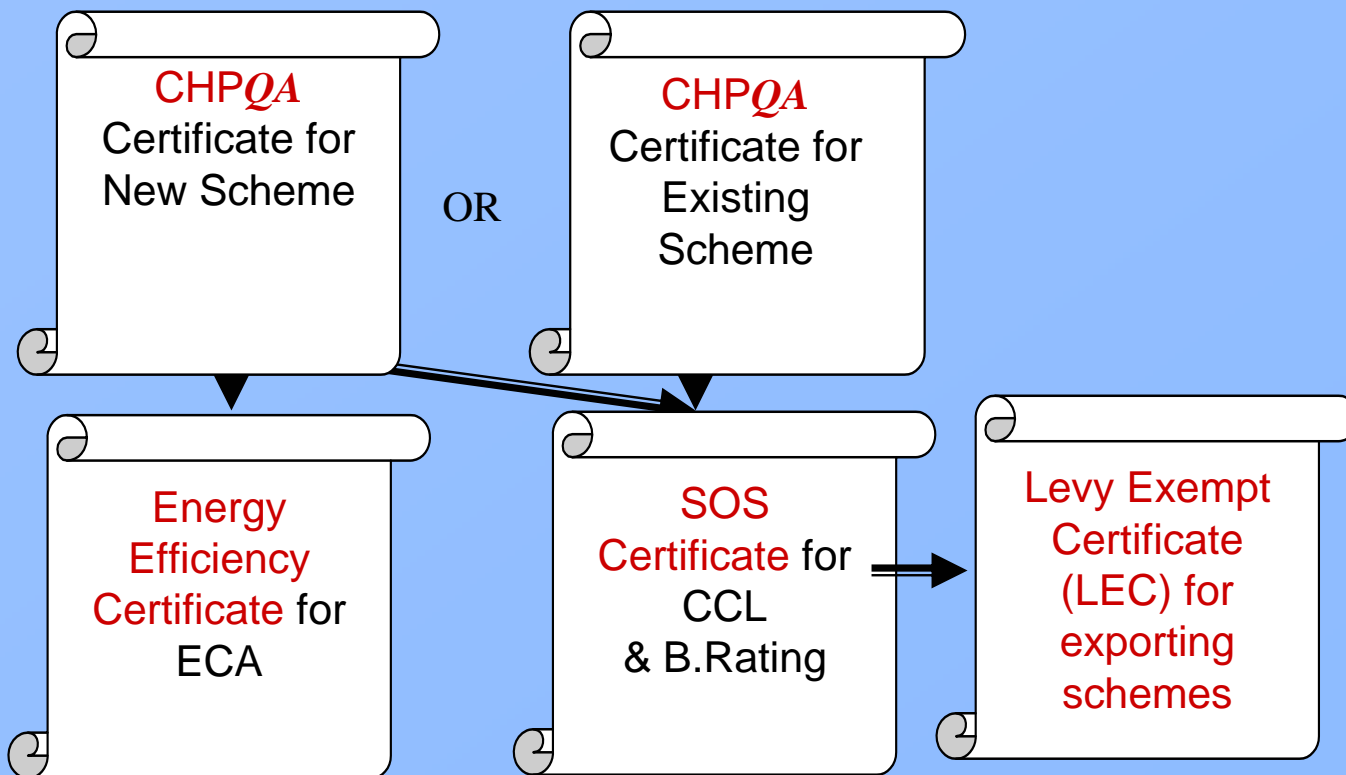


•Eligibility for ECA
•Used to monitor UK capacity

Eligibility for CCL exemption on fuel purchases

Eligibility for CCL exemption on electricity supplies

Certificates for Claiming Benefits



Roles and Responsibilities

- Defra
- Other Government Departments
 - HM Revenue & Customs
 - Inland Revenue
 - VOA
- CHPQA Administrator
- Ofgem and Ofreg- for issuing LECs

How is the programme managed?

- About 900 schemes are validated and certified each year,
 - Different levels of complexity (range of sizes, technologies and fuels)
 - and tight timescale (Feb-June) Very challenging
- This necessitated the setting up of:
 - Technical team (to verify and validate submissions) and
 - Administration team (helpline support, checking submissions, issuing certificates, etc)
- A set of forms have been developed and regularly reviewed.
- Comprehensive Guidance Notes were developed
- We also carry out site audits of selected schemes (about 100/annum).

CHPQA Submission Procedure

A range of forms developed :

- **F1..Registration form.** Resubmission only if RP or company name has changed
- **F2 .. Details of equipments within scheme boundary.** Resubmission only if Scheme boundaries or monitoring arrangement have changed
- **F4 .. Actual operational energy data.** Annual submission for all existing Schemes.
- **F3 ... Based on Design data for** all new (under construction and newly commissioned) and upgraded existing Schemes
- Also have simplified forms for Schemes with TPC < 2MWe { **F2(s)**, **F4(s)** and **F3(s)** }
 - Only have to provide three figures per year.

Short Forms for <2MWe CHP Schemes

- Schemes eligible to use short forms:
 - Reciprocating Engine Prime Mover
 - Less than 2MWe 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



CHPQA Forms (paper & electronic)

- CHPQA Paper Forms available to download as both **Microsoft Word** or **PDF**
- You should try the electronic submission system
- Improves on paper submission by:
 - No need for you to carry out calculations
 - Only asking questions that apply to a particular scheme
 - Some of the data provided in the past is pre-populated in the system

Guidance Notes

- **Comprehensive Guidance Notes** were developed and kept up to date
- Individual Guidance notes available to **download as PDF's** from our Website
- However **online electronic submission** (accessed via the web site but need password) **provides direct links** to appropriate guidance notes for a particular section.

CHPQA Website

<http://www.chpqa.com>

- Primary source for CHPQA information
 - CHPQA Documents
 - Guidance Notes
 - CHPQA forms
 - News
 - Useful Contacts
 - FAQ's
 - How to contact us

How the Electronic Submission System works

- **Existing CHPQA** users are automatically registered and informed of their **Username and Password**
- **New users** have to register online first
- After registering, you will see a copy of your details on-screen (F1)
- You should print this Form, sign and post it to us
- We will issue you a Username and Password

Batch Submission

- Companies that wish to supply multiple copies of F4s in batches can do so through the electronic submission system:
 - There is a batch import facility
 - This helps on data entry only - the company will still have to go through and approve each submission online

Simplified arrangement for schemes <500kWe

➤ Criteria:

- Single unit of Total Power Capacity <500kWe
- No heat rejection facility
- No Gas meter installed
- Gas consumption can be estimated using average Power Efficiency listed on [CHPQA CHP Unit List](#)

➤ Process:

- Determine Total Power Output
- Divide by Power Efficiency from Unit List
- e.g $1,500 \text{ MWh} / 0.28 = 5,357 \text{ MWh}$ of Fuel

CHPQA Auditing

We carry out periodic Audits of CHP Schemes,

- to confirm that the Standard has been correctly interpreted, and
- that any data submitted at the time of the Self-Assessment can be verified.
- Audits typically involve a site-based evaluation of a CHP Scheme
- Check CHP boundary

Heat Monitoring Requirement for this year's submission (2006 data)

- All Schemes are required to monitor the useful heat supplied (*except Schemes <2MWe with no heat rejection facility*).
- If you don't have 12 months of monitored data for 2006, estimates should not be used for the missing months instead assume 0MWh
- Only actual monitored heat data can be used.
- What else to consider? See next slide:

Two Options if <12 months of heat data

- Option 1: Use monitored heat, electricity and gas figures available for the whole year (thus zero heat for some months).
- Option 2: Use monitored heat, electricity and gas figures available for the same period (thus only months where actual monitored heat data).
- For guidance on how to monitor heat see CHPQA [GN13](#) (section 13.11) and [GN16](#) (sections 16.12-16.19).

Heat monitoring not yet installed?

- These schemes are non-compliant.
- Have no entitlement for CHPQA associated fiscal benefits for 2006 and beyond
- Can be re-certified once a heat monitoring system is installed.
- Would then need to obtain new SOS certificate before start claiming CCL exemption.

Plan to install heat monitoring system in 2007?

- These schemes are non-compliant.
- Can be re-certified once the heat monitoring system is installed.
- Submission based on actual 2006 fuel and electricity data and *zero heat*.
- Need to obtain new SOS certificate before start claiming CCL exemption.
- Can only claim CCL exemption from the date of new SOS certificate



If you have Ener.G Heat Monitoring installed

- < 500KW & No Heat Rejection
 - Use Unit List rated heat and power capacities to determine heat to power ratio (H:P)
 - Multiply H:P by actual power produced [MWh]
- Heat Rejection
 - Extra Temp Sensor installed upstream of heat rejection equipment
 - Delta T monitored by remote monitoring system as daily average
 - Useful heat calculated using $Q = mcDT$
 - m = design flowrate ~ verified as a fixed flowrate

If you have Cogenco Heat Monitoring installed

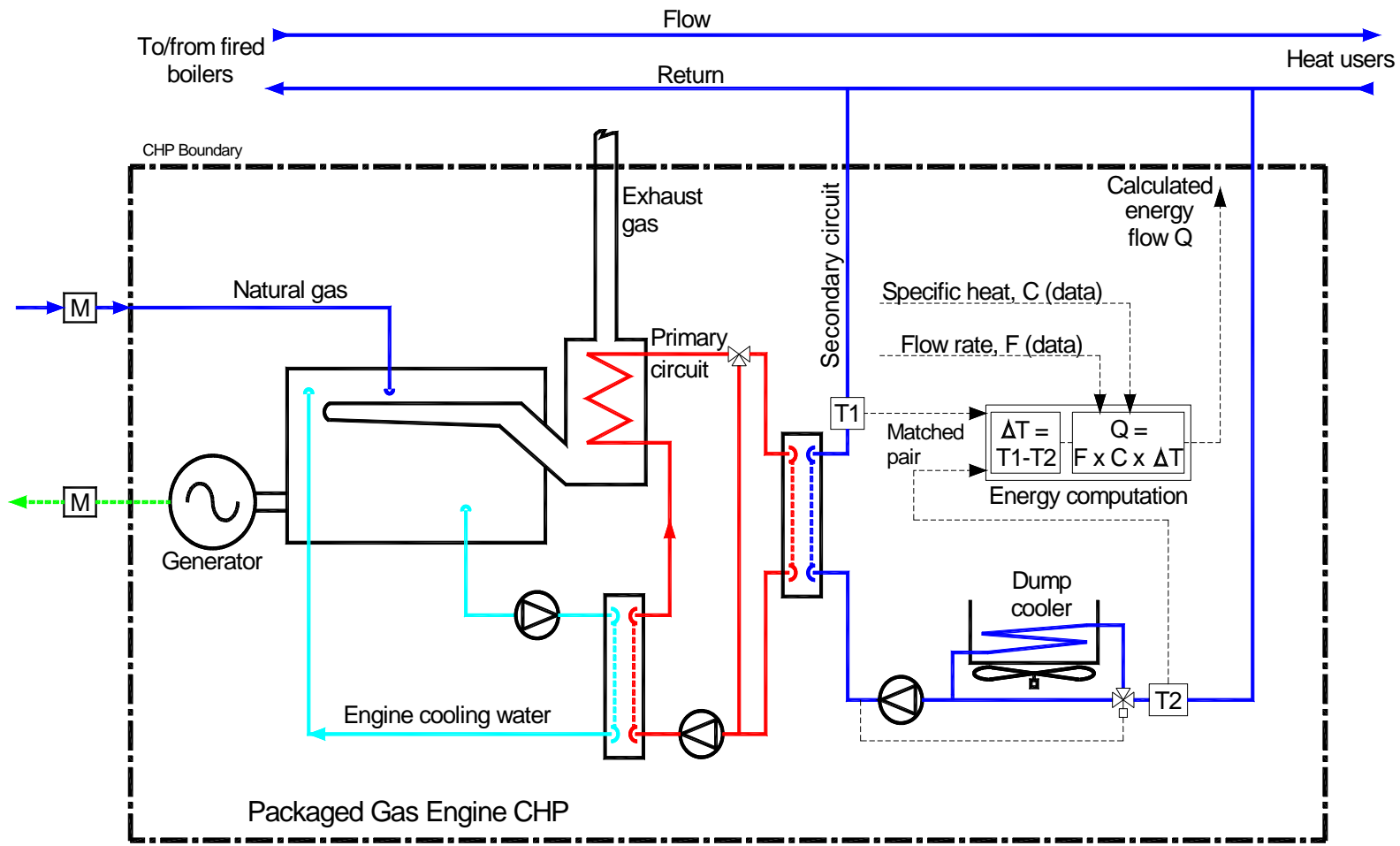
- < 500KW & No Heat Rejection
 - Use Unit List rated heat and power capacities to determine heat to power ratio (H:P)
 - Multiply H:P by actual power produced [MWh]
- Heat Rejection
 - Each site responsible for installing appropriate heat monitoring equipment
 - Kamstrup system offered by CCL
 - Two temp sensors measure delta T across site
 - Flowrate tested and average programmed into meter
 - Meter gives cumulative useful heat output [MWh]
 - Recommend meter is read and recorded monthly

Heat monitoring options

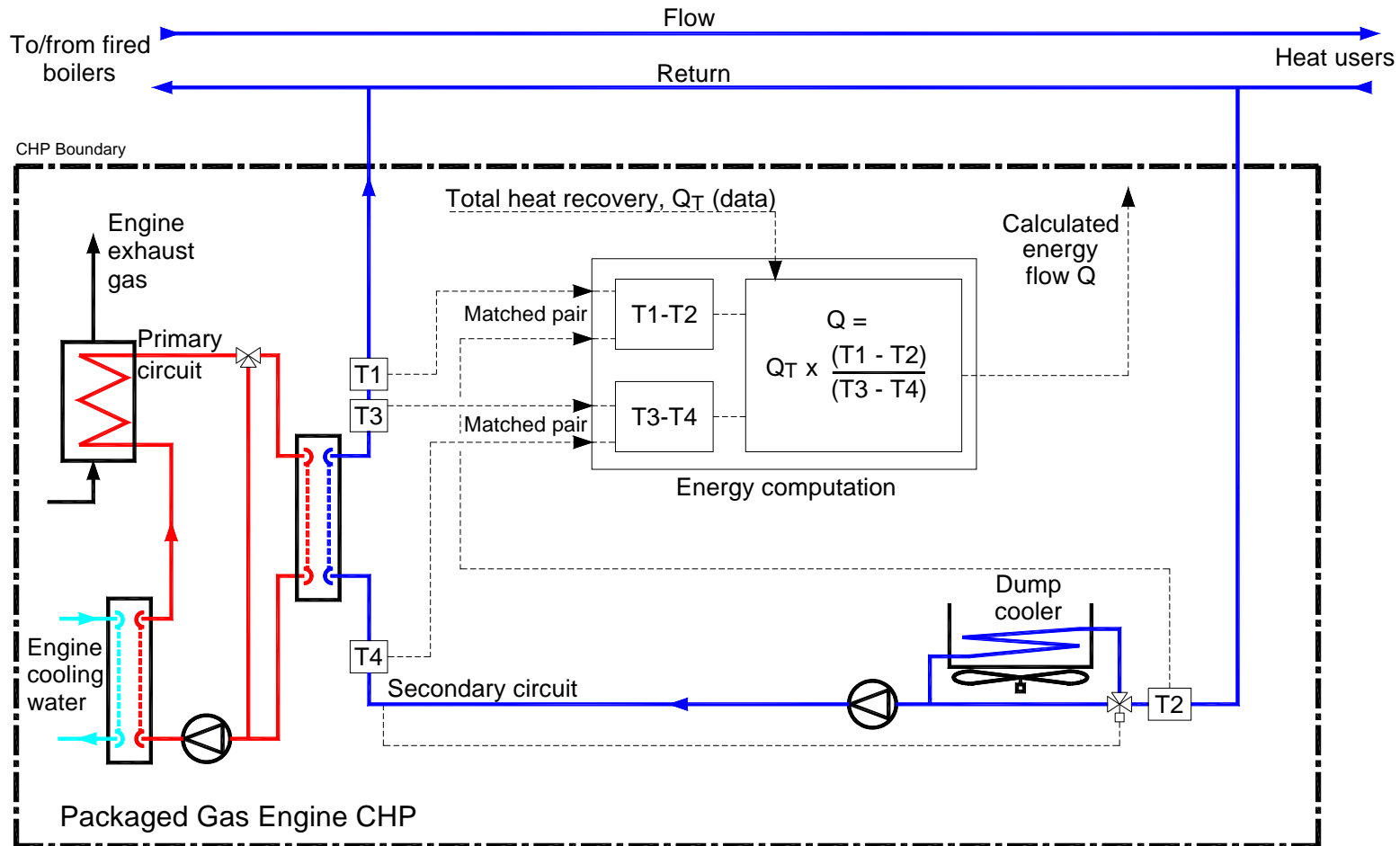
1. Stand alone Commercially available heat meters (fully integrated heat meters)
2. Heat metering by computation within control systems, i.e BMS
 - use flow and return temperatures and measure flow rate
3. Schemes below 2 MWe with a dump facility
 - Use 2 temperature sensors and fixed flow rate
4. An alternative for Schemes below 2 MWe with a dump facility
 - Use two matched pairs of platinum resistance and design H:P



Schemes below 2 MWe with a dump facility



An alternative for Schemes below 2 MWe with a dump radiator



The Timetable

- CHPQA Certificates cover a calendar year and expire at the end of December
- Secretary of State (CHP Exemption) certificates are open ended
- entitling Schemes to continue claiming CCL exemption, provided
- that a valid CHPQA certificate is presented to Defra by the end of June of the following year

The Timetable

- All CHPQA Certificates issued in 2006 expired 31st Dec 2006.
- SOS certificates are open ended
- entitling you to continue claiming exemption, provided ...
- that a valid CHPQA certificate is presented to Defra by the end of June 2007 (together with completed pro-forma)

Where do you go from here?

- New applications should be submitted to the CHPQA Administrator by **28 March 2007**
- Based on 2006 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 2007**

Finally

- ✓ Submit your CHPQA Forms before end of March 2006
- ✓ We endeavour to issue you new CHPQA certificate by the middle of June.
- ✓ You then have to inform Defra, by the end of June 2006, to maintain the validity of your SOS certificate
- ✓ If you have CHP and have not yet applied to the CHPQA programme, act now
- ✓ You should now have sorted out the heat monitoring issue. If not contact the CHPQA Administrator **urgently**

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Help & Advice



defra
Department for Environment
Food and Rural Affairs

CHPQA Contact details

- Contact the Administrator:
- Mail: CHPQA Programme
The Gemini Building
Fermi Avenue
Harwell International Business Centre
Didcot
OX11 0QR
- E-mail: chpqainfo@chpqa.com
- tel: 0870 190 6196
- fax: 0870 190 6334
- Website: www.chpqa.com



Are you planning to export electricity?



Exporting Schemes

- Need to register with Ofgem to obtain LECs
- 1 LEC = 1 MWh of QPO= £4.3 (£4.4 from april 2007)
- Ofgem will request Scheme's details from CHPQA Administrator
- RP has to sign a declaration before any information is passed on to Ofgem
- CHPQA will then provide Ofgem with with the required data
- Ofgem will then populate their CIMS database with the scheme's details and
- Provide you with a user number and password
- You will then enter monthly electricity data.
- Ofgem will then issue equivalent LECs
- Based on Monthly TPO*(QPO/TPO)