



Support for CHP under the RO and RHI

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Summary

- Introduction to the Renewables Obligation
 - The RO and Banding
 - Terminology in the RO
 - Support for Good Quality CHP

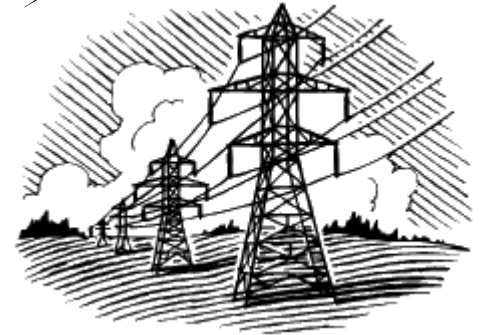
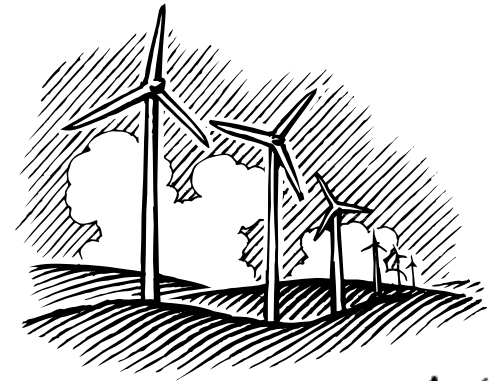
- CHPQA and the RO
 - ROC Eligibility for Good Quality CHP
 - CHPQA Certification for ROCs

- The Renewable Heat Incentive
 - Current support for CHP
 - Future support for Good Quality CHP



Introduction to the Renewables Obligation

- Introduced in 2002
- Support electricity generation from renewable sources:
 - Obligation on electricity suppliers
 - Awards certificates (ROCs) to generators
- Separately legislated in:
 - England and Wales
 - Scotland
 - Northern Ireland
- Continually reviewed and developed
- Will close to new generation end of March 2017 and then run until 2037





The RO and Banding

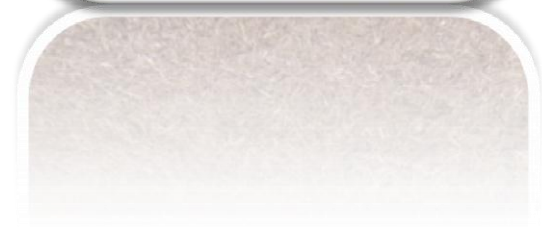
Key Features:

- “Banding” concerns the provision varying levels of support (ROCs/MWh) for different types of generation technology
- First introduced in 2009 and gave:
 - Enhanced support for schemes fuelled by energy crops
 - Enhanced support to Good Quality (GQ) CHP over power-only schemes (“CHP uplift”) for selected generation technologies
 - Support for GQ CHP fuelled by waste but not power-only EfW
- New banding regime introduced in April 2013 to run through to 2017



RO Terminology

- **Biomass** - fuels where greater than 90% of its energy content is of biogenic origin
- **Waste** – fuels where >10% but <90% of its energy content is of biogenic origin
- **Energy Crops** - specific non-food crops grown for energy production
- **Co-firing** – generating station that generates electricity partly from fossil fuel and partly from renewable sources. The 2012 order has three sub-sets based on proportion of total energy content from renewable sources:
 - High range: $\geq 85\%$ but $<100\%$
 - Mid range: $\geq 50\%$ but $<85\%$
 - Low range: $<50\%$





Banding Regime 2013 to 2017

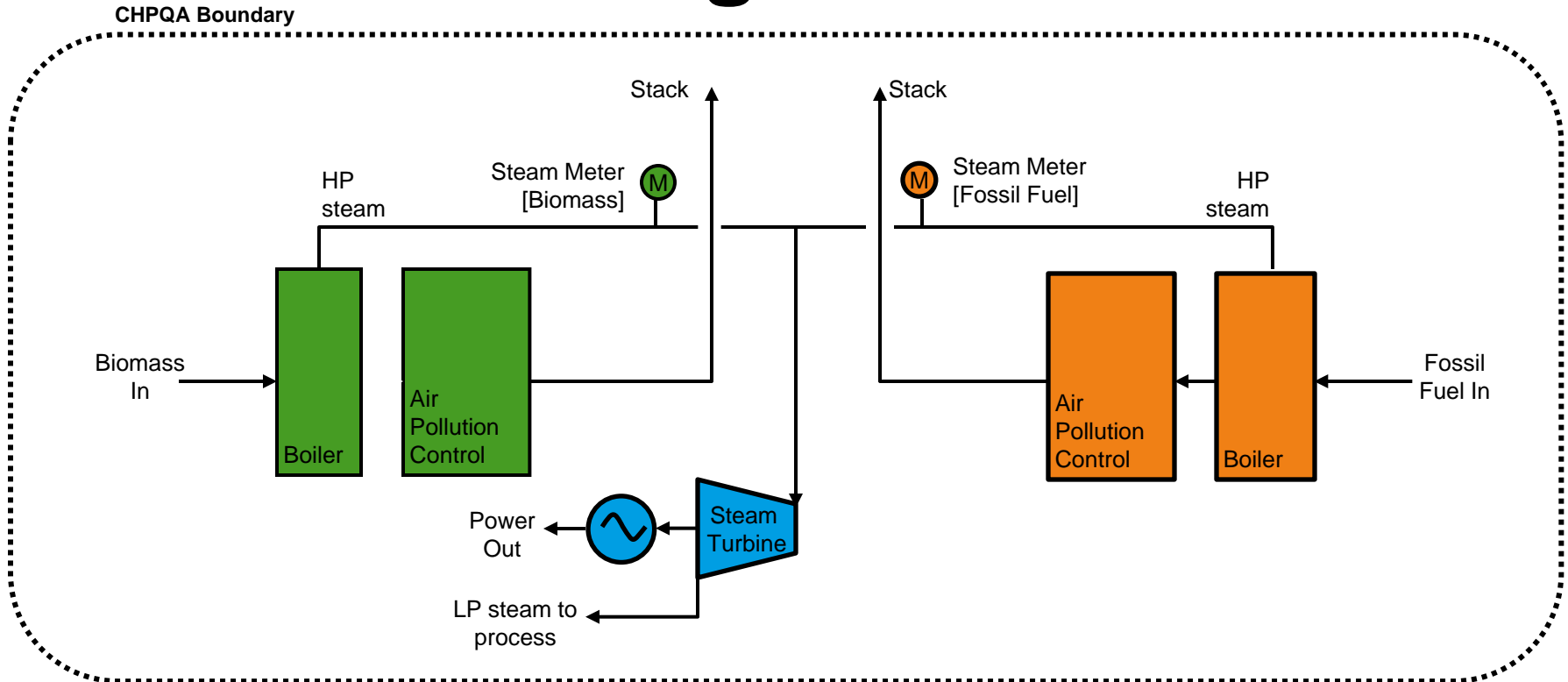
Generation Type		Eligible Power Output [ROCs/ MWh]	Remaining Output [ROCs/MWh]
Biomass / Energy Crops Conversion		1.5	1
Co-firing of bio-liquids		0.8	0.3
Dedicated Biomass	2013-2015	2	1.5
	2015/16 [†]	1.9	1.5
	2016/17 [†]	1.8	1.4
High-range co-firing of biomass		1.2	0.7
Low-range co-firing of biomass		0.8	0.3
Low-range co-firing of energy crops		1.3	0.8
Mid-range co-firing of biomass/energy crops		1.1	0.6
Energy from Waste		1	

Key features:

- New capacity can choose between CHP uplift or RHI prior to March 2015
- After March 2015, new capacity can only receive uplift if it is ineligible for support under the RHI
- CHP uplift will be grandfathered after 2017 but **operators will still need to be certified annually by CHPQA**



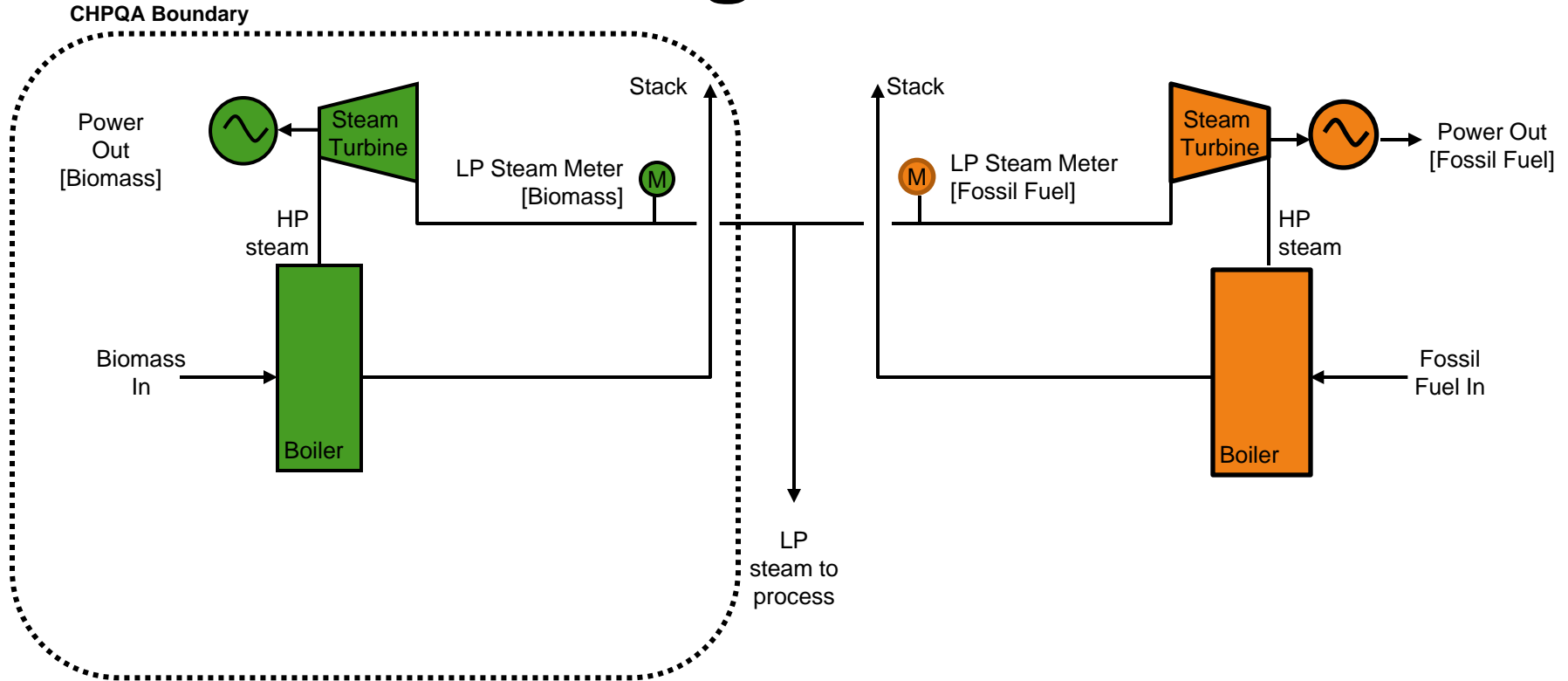
Co-firing with CHP



To qualify for CHP uplift on co-firing bands, installations need to burn renewable and fossil fuels in separate combustion units



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ROC Eligibility

For GQCHP, the power output eligible for the award of ROCs is determined using:

$$\text{Eligible Power Output} = \text{NPO} \times \text{Biomass Content (\%)} \times \left(\frac{\text{QPO}}{\text{TPO}} \right)$$



Dual CHPQA Certification

CHPQA

Quality Certification for an existing CHP Scheme

CHPQA Certificate No: [REDACTED]

Scheme: [REDACTED]

CHPQA Scheme Reference No: [REDACTED]

This is to Certify that the Self-Assessment of the above CHP Scheme undertaken by [REDACTED] of Scheme performance during the calendar year: 2010 has been Validated under the Combined Heat and Power Quality Assurance programme and that:

- The Total Power Capacity of this Scheme is: 0.600 MWe
and the **Qualifying Power Capacity** is: 0.600 MWe
- The threshold Power Efficiency criterion for this Scheme is: 20 %
and the **Power Efficiency** of this Scheme is: 34.43 %
- The Qualifying Heat Output from this Scheme is: 923 MWh
and the **Heat Efficiency** of this Scheme is: 10.55 %
- The threshold Quality Index criterion for under Initial Operation is: 95
and the **Quality Index** of this Scheme is: 110.79
- The Total Fuel Input to this Scheme is: 8,749 MWh
and the **Qualifying Fuel Input** is: 8,749 MWh
- The Total Power Output from this Scheme is: 3,012 MWh
and the **Qualifying Power Output** is: 3,012 MWh

CHPQA

Quality Certification for an existing CHP Scheme for ROCs eligibility

CHPQA Certificate No: [REDACTED]

Scheme: [REDACTED]

CHPQA Scheme Reference No: [REDACTED]

This is to Certify that the Self-Assessment of the above CHP Scheme undertaken by [REDACTED] of Scheme performance during the calendar year: 2010 has been Validated under the Combined Heat and Power Quality Assurance programme and that:

Information for ROCs Eligibility	
1. The Total Power Capacity of this Scheme is:	0.600 MWe
2. The Power Efficiency of this Scheme is:	34.43 %
3. The Qualifying Heat Output from this Scheme is: and the Heat Efficiency of this Scheme:	923 MWh 10.55 %
4. The threshold Quality Index criterion for this Scheme under Annual Operation is: and the Quality Index of this Scheme is:	100 110.79
5. The Total Fuel Input to this Scheme is: and the Qualifying Fuel Input is:	8,749 MWh 8,749 MWh
6. The projected Total Power Output from this Scheme is: and the Qualifying Power Output is:	3,012 MWh 3,012 MWh
7. The Technology Type for this Scheme is:	Reciprocating Engine
8. The Main Fuel Type for this Scheme is:	Other Biogas (e.g. gasified woodchips)
9. The Percentage of Renewable Fuel is:	100.00%

6. The projected Total Power Output from this Scheme is: 3,012 MWh
and the Qualifying Power Output is: 3,012 MWh

Approved by the CHPQA Administrator on behalf of DECC. Date: [REDACTED]

The CHPQA programme is carried out on behalf of the Department of Energy and Climate Change (DECC), in consultation with the Scottish Executive, The National Assembly for Wales, and the Northern Ireland Department of Enterprise, Trade and Investment.

For the purposes of the Climate Change Levy (General) (Amendment) Regulations 2003 (only), the QPO limit shall be equal to the actual output of the station multiplied by the following ratio: the Qualifying Power Output referred to at item 6 above over the Total Power Output referred to at item 6 above.

Approved by the CHPQA Administrator on behalf of DECC. Date: [REDACTED]

The CHPQA programme is carried out on behalf of the Department of Energy and Climate Change (DECC), in consultation with the Scottish Executive, The National Assembly for Wales, and the Northern Ireland Department of Enterprise, Trade and Investment.

For the purposes of the Climate Change Levy (General) (Amendment) Regulations 2003 (only), the QPO limit shall be equal to the actual output of the station multiplied by the following ratio: the Qualifying Power Output referred to at item 9 above over the Total Power Output referred to at item 9 above.



ROC Eligibility – QI Definitions

- QI Definitions for ROCs Eligibility are provided in CHPQA Guidance Note GN44 – available from <http://chpqa.decc.gov.uk>
- As a result of the CHPQA review, new definitions have been created for new schemes seeking ROCs Eligibility
- Current QI definitions will be grandfathered for currently operating schemes and those schemes that reached financial close prior to 26th July 2012
- All other schemes will be subject to new definitions from January 2014



QI Definitions for Existing Schemes

Table 1: QI Formulae For Various Types Of CHP Biomass Schemes >25MWe

Solid waste	$QI = 364 \times \eta_{power} + 140 \times \eta_{heat}$
Agricultural Biomass	$QI = 338 \times \eta_{power} + 130 \times \eta_{heat}$
Wood Fuels	$QI = 315 \times \eta_{power} + 120 \times \eta_{heat}$

Table 2: QI Formulae For Various Types Of CHP Biomass Schemes Equal To Or Less Than 25MWe

Solid waste	$QI = 370 \times \eta_{power} + 140 \times \eta_{heat}$
Agricultural Biomass	$QI = 370 \times \eta_{power} + 130 \times \eta_{heat}$
Wood Fuels	
≤1MWe	$QI = 329 \times \eta_{power} + 120 \times \eta_{heat}$
>1 to ≤25MWe	$QI = 315 \times \eta_{power} + 120 \times \eta_{heat}$

Table 3: QI Formulae For Advanced Conversion Technology Producing Syngas To Be Used In Reciprocating Engines Or Gas Turbines.

Syngas	
≤1MWe	$QI = 285 \times \eta_{power} + 120 \times \eta_{heat}$
>1 MWe	$QI = 251 \times \eta_{power} + 120 \times \eta_{heat}$



ROC Eligibility – QI Definitions

Advanced Conversion Technologies (ACTs)

- Gasification
- Pyrolysis
- Anaerobic Digestion

In these cases the biogas/syngas will be considered as the input fuel to the scheme and not the biomass/waste that is supplied to the ACT process



Renewable Heat Incentive

- Non-domestic scheme launched in November 2011
- Provides support for variety of renewable heat technologies, including
 - Biomass (including biomass in MSW)
 - Biogas
 - Geothermal
- Support extends to eligible heat-only and CHP installations
- Currently at 1.0 p/kWh for schemes > 1 MW in capacity
- CHP must have been commissioned or converted to CHP operation on/after 15th July 2009

CHP cannot claim both RHI support and CHP uplift under the RO



RHI Expansion

DECC currently consulting on expansion of the Non-Domestic Scheme

- Proposals are to extend support to additional heat technologies (e.g. Air-Air Heat Pumps, Biomass Direct Air Heating)
- **Proposal to provide specific tariffs for biomass and bioliquid-fuelled GQCHP**
 - Proposed tariff for **large biomass CHP is 4.1p/kWh** (compared to 1p/kWh for large-scale biomass boilers)
 - Bioliquid will only be supported under RHI when used in GQCHP
- Schemes will need to **be certified by CHPQA** in order to benefit from CHP tariffs
- Support for bioliquids based CHP schemes may be limited to those eligible for ROCs (i.e. $< 1 \text{ MW}_e$)

Implementation details soon to be published