



Carbon Price Support – Latest Developments

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Talk Coverage

1- Background

2- How CPS affect:

- Standard Generators (Power Stations)
- Auto-generators (>75% power output used on site)
 - Less than 2MW_e capacity
 - $\geq 2\text{MW}_e$ capacity
- Good Quality CHP (GQCHP)
 - Fully Qualifying
 - $\leq 2\text{MW}_e$ capacity
 - $> 2\text{MW}_e$ capacity
 - Partially Qualifying
 - $\leq 2\text{MW}_e$ capacity
 - $> 2\text{MW}_e$ capacity

3- Examples



Background

- Government sought to introduce a floor price for carbon to **stabilise price signals to investors in low carbon technologies**
- This was implemented by introducing new rates levied upon supplies of the **following taxable commodities to power generators** (including CHP):

CCL

- Natural Gas
- LPG
- Coal

Fuel Duty

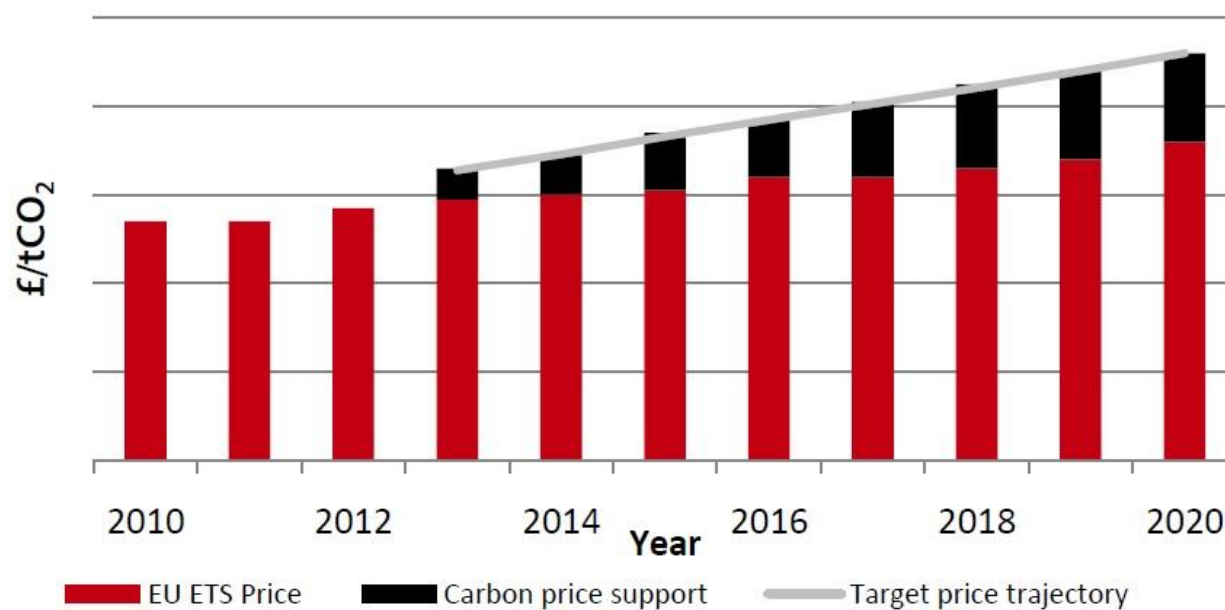
- Fuel oil
- Gas oil
- Bio-blends

- These are known as carbon price support (CPS) rates
- CPS rates came into effect from 1st April 2013



Background

Chart 4.A: Illustration of the carbon price support mechanism



Source: HM Treasury, 2010



CPS Rates

<https://www.gov.uk/guidance/climate-change-levy-application-rates-and-exemptions#carbon-price-support-rates>

Capped
until 2020

Commodity	Units	2013/14	2014/15	2015/16	2016/17
Natural Gas	£/kWh	0.00091	0.00175	0.00334	0.00331
LPG	£/kg	0.01460	0.02822	0.05307	0.05280
Coal	£/GJ	0.44264	0.81906	1.56860	1.54790
Fuel Oil	£/litre	0.01568	0.03011	0.05730	0.05711
Gas Oil	£/litre	0.01365	0.02642	0.04990	0.04916



QGCHP Exemption from CPS

- Initially the Government introduced an exemption from the CPS for fuels attributable to heat generation (QHO).
- With effect from 1 April 2015 the government introduced another exemption from the CPS for fossil fuels that are used in CHP to generate QPO used onsite or supplied under exemption from a supplier licence.

As announced at Budget 2014,from 1 April 2015 the government will exclude from the carbon price support rates, fossil fuels that are used by CHPs to generate good quality electricity that is self-supplied or supplied under exemption from the requirement to hold a supplier licence. (Finance Bill 2015)



Power Stations

Previous Arrangement



- Fuel input exempt from CCL
- Electricity output is subject to CCL (charged on to consumer)

Under CPF Regime

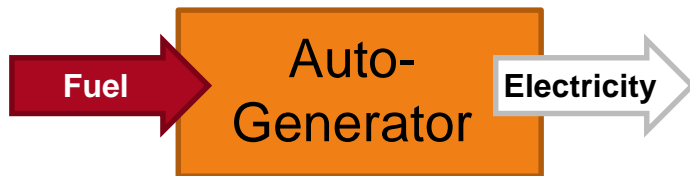


- Fuel input subject to CPS rates
- No change for Electricity output (CCL paid by consumers)
- **Additional costs to generators due to CPS rates.**
- **Can be expected to be passed on to consumers in the form of higher electricity tariffs.**



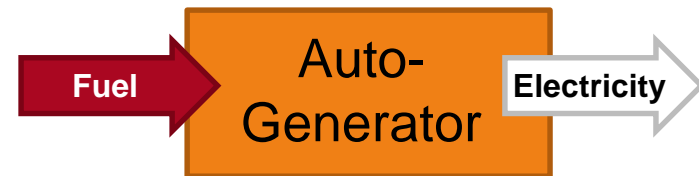
Auto-generators < 2MW_e

Previous Arrangement



- Fuel input subject to 100% CCL
- Electricity output consumed on site exempt from CCL

Under CPF Regime

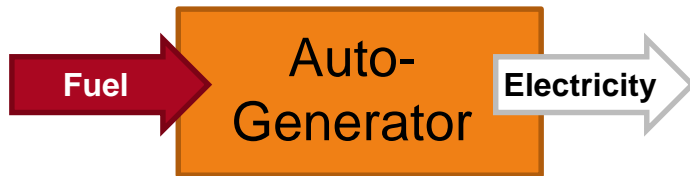


- Exempt from CPS
- No change on CCL (fuel input subject to 100% CCL, and electricity consumed on site exempt from CCL)



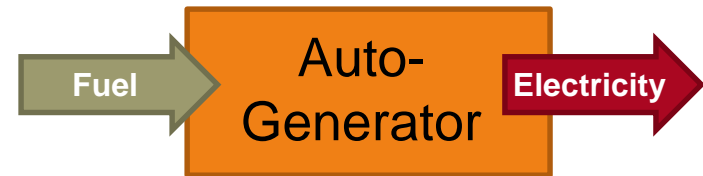
Auto-generators $\geq 2\text{MW}_e$

Previous Arrangement



- Fuel input subject to 100% CCL
- No CCL on Electricity output consumed on site

Under CPF Regime



- No CCL on fuel input
- Fuel input subject to 100% CPS rates
- All electricity output subject to 100% CCL - **same as grid electricity**



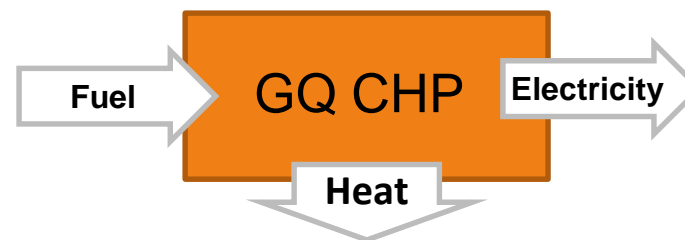
GQCHP – Fully Qualified with Capacity $\leq 2\text{MW}_e$

Previous Arrangement



- Fuel input exempt from CCL
- Electricity output exempt from CCL
- (Heat not subject to CCL)

Under CPF Regime



- Fuel input exempt from CPS
- Exempt from CCL on fuel input and electricity output directly supplied



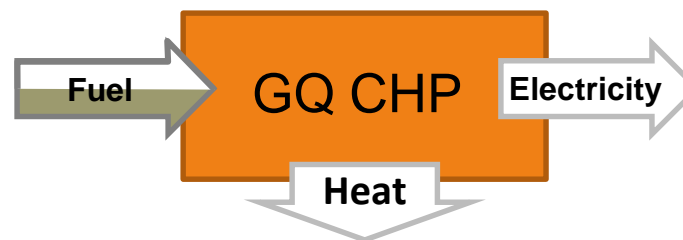
GQCHP – Fully Qualified with Capacity $>2\text{MW}_e$

Previous Arrangement



- Fuel input exempt from CCL
- Electricity output exempt from CCL

Under CPF Regime



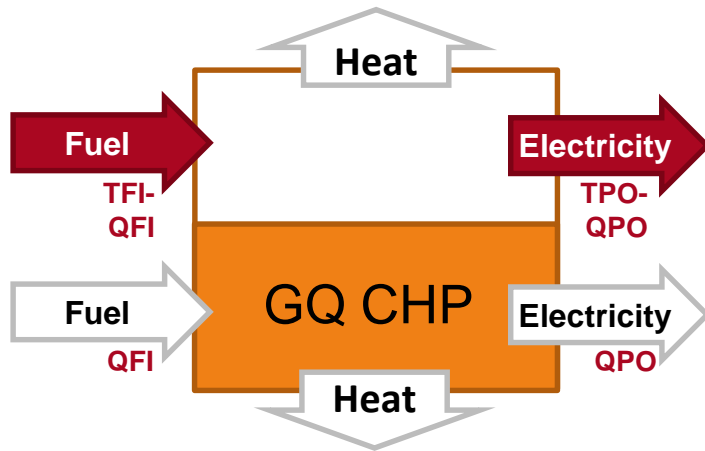
- Fuel input exempt from CCL
- Electricity output exempt from CCL where directly supplied.
- Fuel for heat (QHO) not liable to CPS rates
- Fuel input attributable to electricity generation used on site not liable to CPS rates (from April 2015)

In this case No CCL or CPS Liability



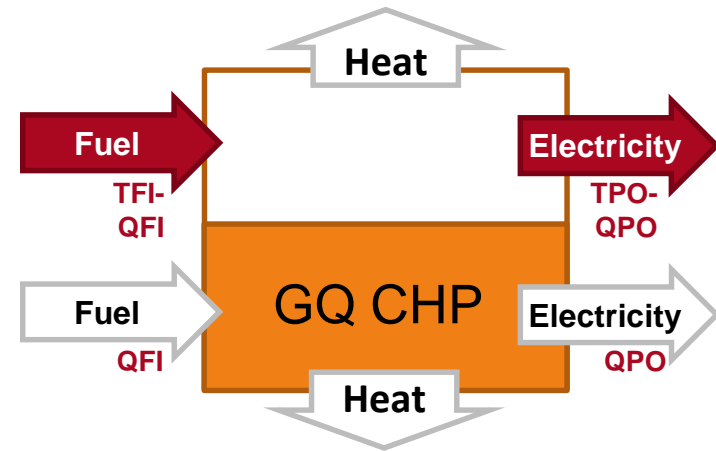
GQCHP – Partially Qualified with Capacity $\leq 2\text{MW}_e$

Previous Arrangement



- Qualifying fuel input (QFI) exempt from CCL
- Fuel input **not QFI** is subject to CCL
- Qualifying power output (QPO) exempt from CCL
- Power output **not QPO** subject to CCL

Under CPF Regime

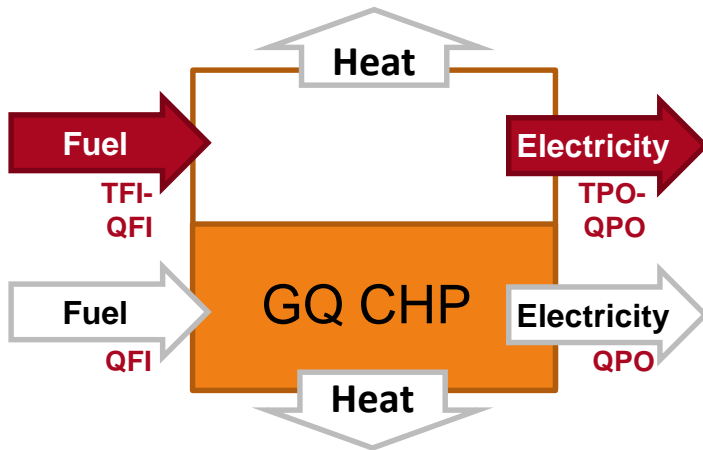


- No CPS
- Qualifying fuel input (QFI) exempt from CCL
- Qualifying power output (QPO) exempt from CCL where directly supplied



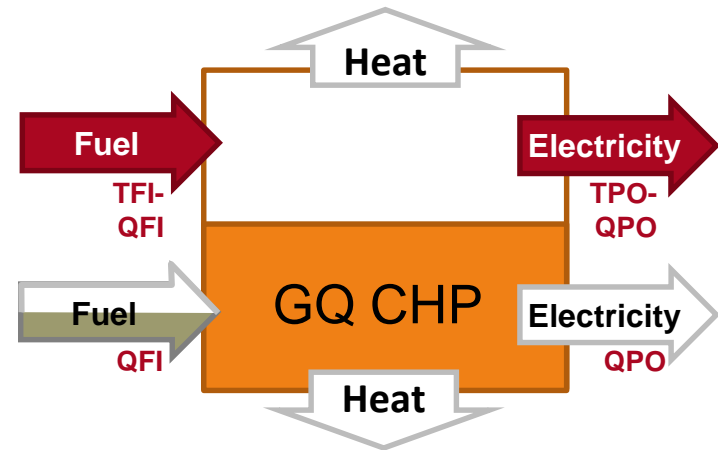
GQCHP – Partially Qualifying with Capacity $>2\text{MW}_e$

Previous Arrangement



- Qualifying fuel input (QFI) exempt from CCL
- Fuel input **not QFI** is subject to CCL
- Qualifying power output (QPO) exempt from CCL
- Power output **not QPO** subject to CCL


Under CPF Regime



- Qualifying fuel input (QFI) exempt from CCL
- Fuel input **not QFI** is subject to CCL
- Qualifying power output (QPO) exempt from CCL if **directly supplied**
- Fuel for heat (QHO) not liable to CPS rates
- Fuel attributable to QPO used on site is not liable to CPS rates.



Advising CPS Liability for GQCHP

CHP QA 

*Quality Certification for
an existing CHP Scheme*

CHPQA Certificate No: **PH04/12/016**

Scheme: **THE SCOTLAND ELECTRICITY TRANSMISSION BOARD
SCOTLAND'S 100% RENEWABLE ENERGY
SCHEMES**

DRAFT

CHPQA Scheme Reference No: **10000**

This is to Certify that the Self-Assessment of the above CHP Scheme undertaken by
of Scheme performance during the calendar year: **2012** has been Validated under the Combined Heat and
Power Quality Assurance programme and that:

1. The Total Power Capacity of this Scheme is:	500.00 MWe
and the Qualifying Power Capacity is:	500.00 MWe
2. The threshold Power Efficiency criterion for this Scheme is:	20.00 %
and the Power Efficiency of this Scheme is:	17.45 %
3. The Qualifying Heat Output from this Scheme is:	1,000,000 MWh
and the Heat Efficiency of this Scheme is:	46.06 %
4. The threshold Quality Index criterion for under Initial Operation is:	95
and the Quality Index of this Scheme is:	83.52
5. The Total Fuel Input to this Scheme is:	1,000,000 MWh
and the Qualifying Fuel Input is:	1,000,000 MWh
6. The Percentage of Fuel Input Referable to Electricity Generation is:	43.06 %
7. The Percentage of Conventional Fuel is:	100.00 %
8. The Total Power Output from this Scheme is:	500.00 MWh
and the Qualifying Power Output is:	500.00 MWh
9. The fuel supply reference(s) (e.g. TRANSCO MPR gas meter reference nos. and/or other unique ID descriptors) for this Scheme are:	

This certificate is a statement of Scheme performance over the period 01/01/2012 to 31/12/2012 and is valid until 31/12/2013.

Approved by the CHPQA Administrator on behalf of DECC. Date: 01/01/2013

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 QP0 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 8 above.

6. The Percentage of Fuel Input Referable to Electricity Generation is: **43.06 %**
7. The Percentage of Conventional Fuel is: **100.00 %**

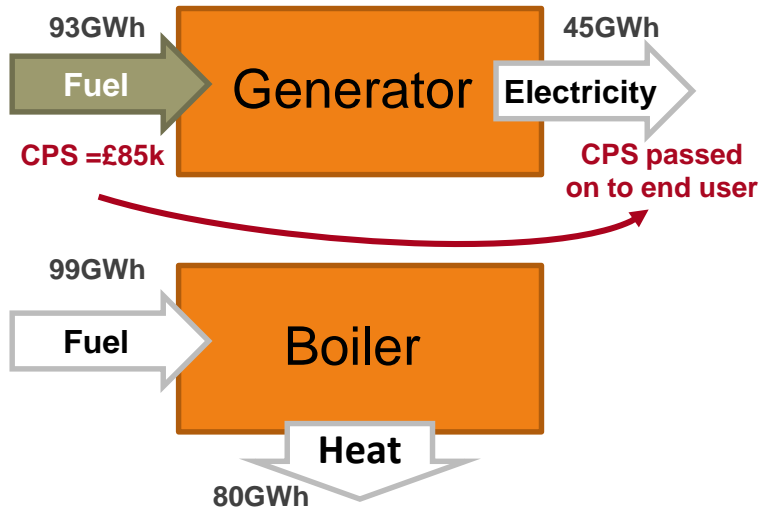
See HMRC Guide to the
Carbon Price Floor updated
30 April 2015. This is CCI1/6



Frequently Asked Questions

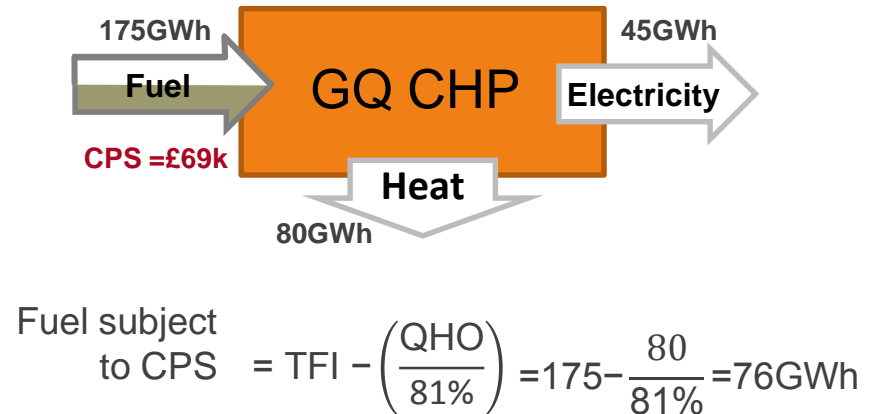
Is the impact of CPS on GQCHP worse than that for separate generation of heat and power?

Separate Generation



CPS liability (power Station only) = £312k

Good Quality CHP



CPS liability = £253k
saving £59k on Fuel for Heat only
 (based on 2015 CPS rate of £3.34/MWh
 or **£312k** when Fuel for QPO is included)





CPS liability Calculation

- Fuel referable to the production of electricity is determine using:

$$Q = \left(TFI - \frac{QHO}{\eta_{h,ref}} \right) \times \left(1 - \frac{MO}{TPO} \right)$$

- Percentage of Fuel input referable to Electricity Generation is given on the CHPQA certificate
- For fuel input referable to non-GQ CHP electricity it was decided not to incorporate this into the CHPQA certificate (**See HMRC document CCL1/6 - a guide to carbon price floor**)
- Fuels referable to the production of non-qualifying electricity use the following formula:

$$\text{Fuel Subject to CPS, R} = Q \times \left(1 - \frac{ES}{TPO - MO} \right)$$

Where:

Q: Fuel for Electricity

ES: Electricity used on site ($\leq QPO$)

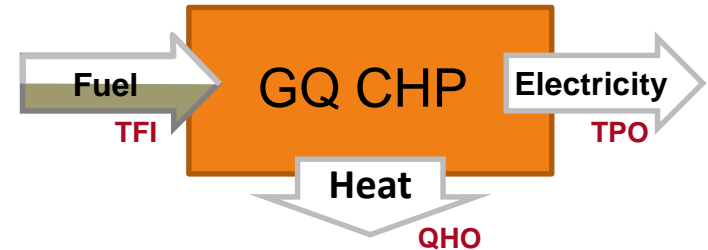
MO:- Mechanical Power



Example 1: Full GQCHP >2MWe

Fuel input referable to electricity production:

$$Q = \left[\text{TFI} - \left(\frac{\text{QHO}}{81\%} \right) \right] \times \left[1 - \left(\frac{\text{MO}}{\text{TPO}} \right) \right]$$



TPC	-	150 MWe
TFI	-	1,234 GWh
TPO	-	439 GWh
QHO	-	420 GWh
η_p	-	35.6% ✓
QI	-	102.87 ✓
MO	-	0
10% of electricity exported		

Fuel Subject to CPS:

$$R = Q \times \left[1 - \left(\frac{\text{ES}}{\text{TPO} - \text{MO}} \right) \right]$$

$$R = 715 \times \left(1 - \left(\frac{439 \times 0.9}{439 - 0} \right) \right)$$

$$R = 71.5 \text{ GWh}$$

$$R/\text{TFI} = 71.5/1,234 = 5.8\%$$

$$\text{Fuel for Electricity, } Q = \text{TFI} - \left(\frac{\text{QHO}}{81\%} \right)$$

$$= 1,234 - \left(\frac{420}{81\%} \right)$$

$$= 715 \text{ GWh} = \underline{58\% \text{ of TFI}}$$

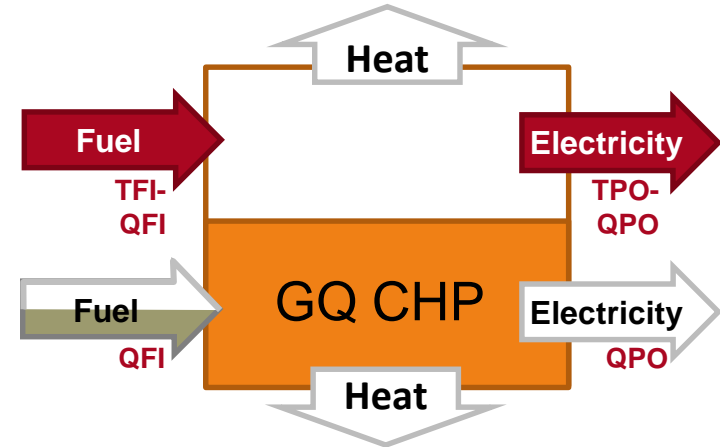
This means 94.2% of TFI is exempt from CPS
Worth in order of £3.88 M



Example 2: Partial GQCHP >2MWe

TPC	-	7.2 MWe
TFI	-	57 GWh
TPO	-	9.5 GWh
QHO	-	21 GWh
η_p	-	16.6% ✗
QI	-	73.97 ✗
QFI	-	48GWh
QPO	-	5.8GWh

All QPO used on site



$$Q = \left[TFI - \left(\frac{QHO}{81\%} \right) \right] \times \left[1 - \left(\frac{MO}{TPO} \right) \right]$$

$$= 57 - \frac{21}{81\%}$$

$$= 31 \text{ GWh}$$

$$= \underline{54.4\% \text{ of TFI}}$$

$$R = Q \times \left[1 - \left(\frac{ES}{TPO - MO} \right) \right]$$

$$R = 31 \times \left(1 - \left(\frac{5.8}{9.5 - 0} \right) \right)$$

$$R = 12.1 \text{ GWh}$$

$$R/TFI = 12.1/57 = 21.2\%$$

This means 78.8% of TFI is exempt from CPS,
worth in the order £150k/year