



Impact of the CHPQA Review on Renewable CHP



Talk Coverage

- Background to CHPQA Consultation and reasons for Review
- Outcome of Review
- Introduction of a Safeguard provision
- Grandfathering of existing and new QI formulae
- Revisions to fuel type categorisation
- Flexibility for new renewable CHP supplying heat networks



Background

- 0.5 ROC Uplift for GQCHP fuelled by biomass
- 0.5 ROC Uplift for Co-firing with CHP
- 1.0 ROC/MWh for waste-fuelled GQCHP

Only for Certified GQ CHP!!

To qualify for the allowances, schemes must demonstrate at least:

- 35% overall efficiency (based on GCV), and
- 10% PES when compared with the alternatives

These are accommodated within CHPQA through a set of QI formulae



Reasons for the review

- Some schemes with high electrical efficiency can pass the QI threshold with little or NO heat recovery and/or PES < 10%
- A number of schemes with capacity > 25 MWe, can pass QI threshold with overall efficiency of < 35%
- Schemes with high heat efficiency could potentially pass the QI threshold with PES < 10%
- No overall/thermal efficiency thresholds for < 25 MWe schemes.
- Assumed electrical efficiencies at “Full Condensing” mode were underestimated.
- Treating wet and dry biomass/Waste wood the same?
- Current X & Y values are based on achievable efficiencies when using wet biomass.



Outcome of CHPQA Review

- To fully qualify as GQCHP, all new Renewable CHP schemes must now meet:
 - 10% heat efficiency in addition to:
 - 10% primary energy saving and
 - 35% overall efficiency
- New X&Y coefficients developed
- Safeguard provision put in place to ensure all schemes that meet all the above criteria, fully qualify
- Grandfathering of Existing and New QI Formulae.

The revised arrangements will be applied from 1st January 2014



Recent GN44 Revision

Intended to Guarantee:-

- Min PES 10% for All Schemes
- Min Overall Efficiency 35% (GCV) for >25MWe Schemes
- Min Thermal Efficiency 10% (GCV) for All Schemes
- New Formulas are shown below

QI Formulae				
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}	+ 130 x η_{heat}
>1 to 10MWe	QI =	370 x	η_{power}	+ 130 x η_{heat}
>10 to 25MWe	QI =	370 x	η_{power}	+ 130 x η_{heat}
>25MWe	QI =	350 x	η_{power}	+ 130 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 =	338 x	η_{power}	+ 130 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 =	318 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 =	279 x	η_{power}	+ 120 x η_{heat}

Various Size/Fuel Category X&Y Values are not affected as existing values guarantee above criteria, e.g. >25MWe biogas, bio-liquid and agricultural biomass schemes



New and Old QI Formulae

New QI Formulae					Old QI Formulae			
Category A (e.g. AD gas, sewage gas, landfill gas)								
≤1MWe	QI =	238 x	η_{power}	+ 120 x η_{heat}	QI =	285 x	η_{power}	+ 120 x η_{heat}
>1 to 25MWe	QI =	225 x	η_{power}	+ 120 x η_{heat}	QI =	251 x	η_{power}	+ 120 x η_{heat}
>25MWe	QI =	193 x	η_{power}	+ 120 x η_{heat}	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}	QI =	285 x	η_{power}	+ 120 x η_{heat}
>1 to 25MWe	QI =	251 x	η_{power}	+ 120 x η_{heat}	QI =	251 x	η_{power}	+ 120 x η_{heat}
>25MWe	QI =	193 x	η_{power}	+ 120 x η_{heat}	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}	QI =	275 x	η_{power}	+ 120 x η_{heat}
>1 to 25MWe	QI =	191 x	η_{power}	+ 120 x η_{heat}	QI =	191 x	η_{power}	+ 120 x η_{heat}
>25MWe	QI =	176 x	η_{power}	+ 120 x η_{heat}	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}	QI =	275 x	η_{power}	+ 120 x η_{heat}
>1 to 25MWe	QI =	226 x	η_{power}	+ 120 x η_{heat}	QI =	260 x	η_{power}	+ 120 x η_{heat}
>25MWe	QI =	176 x	η_{power}	+ 120 x η_{heat}	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}	+ 130 x η_{heat}	QI =	370 x	η_{power}	+ 140 x η_{heat}
>1 to 10MWe	QI =	370 x	η_{power}	+ 130 x η_{heat}	QI =	370 x	η_{power}	+ 140 x η_{heat}
>10 to 25MWe	QI =	370 x	η_{power}	+ 130 x η_{heat}	QI =	370 x	η_{power}	+ 140 x η_{heat}
>25MWe	QI =	350 x	η_{power}	+ 130 x η_{heat}	QI =	364 x	η_{power}	+ 140 x η_{heat}
Category F (e.g. Logs, Energy crops, Agricultural residues etc.)								
≤1MWe	QI =	348 x	η_{power}	+ 130 x η_{heat}	QI =	370 x	η_{power}	+ 130 x η_{heat}
>1 to 10MWe	QI =	348 x	η_{power}	+ 130 x η_{heat}	QI =	370 x	η_{power}	+ 130 x η_{heat}
>10 to 25MWe	QI =	348 x	η_{power}	+ 130 x η_{heat}	QI =	370 x	η_{power}	+ 130 x η_{heat}
>25MWe	QI =	338 x	η_{power}	+ 130 x η_{heat}	QI =	338 x	η_{power}	+ 130 x η_{heat}
Category G (e.g. Contaminated waste wood)								
≤1MWe	QI =	352 x	η_{power}	+ 120 x η_{heat}	QI =	370 x	η_{power}	+ 140 x η_{heat}
>1 to 10MWe	QI =	338 x	η_{power}	+ 120 x η_{heat}	QI =	370 x	η_{power}	+ 140 x η_{heat}
>10 to 25MWe	QI =	338 x	η_{power}	+ 120 x η_{heat}	QI =	370 x	η_{power}	+ 140 x η_{heat}
>25MWe	QI =	318 x	η_{power}	+ 120 x η_{heat}	QI =	364 x	η_{power}	+ 140 x η_{heat}
Category H (e.g. Wood pellets, straw, clean waste wood etc.)								
≤1MWe	QI =	329 x	η_{power}	+ 120 x η_{heat}	QI =	329 x	η_{power}	+ 120 x η_{heat}
>1 to 10MWe	QI =	293 x	η_{power}	+ 120 x η_{heat}	QI =	315 x	η_{power}	+ 120 x η_{heat}
>10 to 25MWe	QI =	286 x	η_{power}	+ 120 x η_{heat}	QI =	315 x	η_{power}	+ 120 x η_{heat}
>25MWe	QI =	279 x	η_{power}	+ 120 x η_{heat}	QI =	315 x	η_{power}	+ 120 x η_{heat}



Introduction of Safeguard provision

- QI formulae alone cannot perfectly ensure that all schemes meeting the 3 policy criteria (10% heat efficiency, 10% PES and 35% overall efficiency) fully qualify as GQCHP
- Safeguard provision is introduced to protect schemes failed the QI threshold but still pass the 3 criteria.
- Specific scale back procedure for partially qualifying schemes based on operating point at which scheme just meets policy criteria and recalculation of the X coefficient to give QI of 100 at this point.



Grandfathering of Existing and New QI Formulae

- **The existing GN44 QI formula and GN14 fuel categories will be grandfathered for:**
 - All schemes that were in operation, or can demonstrate that they reached financial close, prior to 26th July 2012.
- **The revised GN44 QI formula, the safeguard provision and the new GN14 fuel categories will also be grandfathered for new schemes for the duration of the policy**

The revised arrangements will be applied from 1st January 2014



Revisions to fuel type categorisation

- For purpose of applying QI formulae, fuels are grouped in terms of the maximum efficiency of their prime mover technology.
- Now 8 fuel categories, each assigned a different alphabetical character (from A-H)
- The fuel categories and their 'default' fuels are shown in the following 3 slides



Fuel Categories A-E

Fuel Category	Fuels included
A	<ul style="list-style-type: none">• Gas produced by anaerobic digestion of biological material,• Sewage gas,• Landfill gas,
B	<ul style="list-style-type: none">• Synthesis gas from gasification of biological material
C	<ul style="list-style-type: none">• Fatty Acid Methyl Esters,• Bio DiMethyl Ether,• Biomass To Liquid fuels,• Virgin vegetable oil,• Pyrolysis oil from pyrolysis of biological material• Hydrogenated vegetable oil• Biomethanol, Bioethanol,• Biobutanol,• Bio Methyl Tertiary Butyl Ether,• Bio Ethyl Tertiary Butyl Ether,
D	<ul style="list-style-type: none">• Tallow,• Used cooking oil
E	<p><u>The biological fraction of:</u></p> <ul style="list-style-type: none">• Municipal solid waste,• Industrial waste,• Clinical waste,• Refuse derived fuel,• Solid recovered fuel,• Poultry litter,• De-watered sewage sludge,• Paper sludge



Fuel Categories F-H

Fuel Category	Fuels included
F	<ul style="list-style-type: none">• Logs,• Roundwood,• Energy crops,• Agricultural residues,• Prunings,• Milling residues,• Arboricultural & Forestry residues,• Distillers grain
G	Contaminated waste wood (grades B-D of PAS 111)
H	<ul style="list-style-type: none">• Wood pellets,• Dry wood chips,• Straw,• Bagasse,• Nut shells, Husks and Cobs,• Visibly clean waste wood (grade A of PAS 111)

- For fuels not listed, developers may submit evidence to CHPQA in support of their argument.
- Need to provide supporting data based on the maximum efficiency for prime movers and physical state of the fuel (solid, liquid or gas)



Allowance for Heat Networks Development

- Flexibility for new renewable CHP supplying heat networks for first 5 years of operation
- QI threshold of 95 for an initial period of operation, comprising the initial year in which scheme commences operation plus the following full 5 calendar years