



# **Biomass and EfW CHP; latest developments and CHPQA interaction with RO, CfDs & RHI**

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# Focus on...

## ➤ CHPQA and the RO

- ROC eligibility for Good Quality CHP
- CHPQA Certification for ROCs (CHPQA GN44 Certificate)

## ➤ CHPQA and CfDs

- Eligibility for '*with CHP*' CfDs, particularly biomass and waste
- CHPQA Certification for CfDs (CHPQA GN44 Certificate)

## ➤ CHPQA and the RHI

- A specific tariff for biomass-fuelled GQCHP, doesn't apply to EfW CHP
- Schemes need to be certified by CHPQA in order to benefit
- Only for heat produced via the engine/turbine
- Introduction of power efficiency threshold



# Renewables Obligation (RO)



# The Renewable Obligation (RO) and Banding

- First introduced in 2009 and gave:
- “Banding” concerns the provision of varying levels of support (ROCs/MWh) for different types of generation technology
- New banding regime introduced in April 2013 to run through to 2017



# Banding Regime 2016/17

Generation Type	CHP Qualifying Power Output [ROCs/MWh]	Non-CHP Power Output [ROCs/MWh]
Co-firing of regular bioliquid with CHP	1.0	0.5
Low-range co-firing of relevant energy crops with CHP	1.5	1.0
Dedicated biomass with CHP*	1.8	1.4
High-range co-firing with CHP	1.4	0.9
Mid-range co-firing with CHP	1.1	0.6
Low-range co-firing with CHP	1.0	0.5
Station/unit conversion with CHP†	1.5	1.0
Energy from Waste with CHP	1.0	0.0

*Ref: The Renewables Obligation Order 2015*

\* Only available in Northern Ireland as NI RHI currently suspended

† Where conversion has been from co-firing CHP

**These are only available where support under the RHI is not available**



# The RO 'Grace Period'

The Renewable Obligation Closure Order (2014):

- Sets out the RO closure date to new renewable capacity as 31 March 2017
- Ensured that projects already supported under the RO will continue to receive support for 20 years under the RO
- Introduced an 18 month 'grace period' designed to protect projects against certain risks of delay and not being able to obtain RO accreditation after 31 March 2017

Biomass CHP wishing to make use of this grace period needed to be CHPQA certified prior to 9th November 2014.... Too late now



# ROC Eligibility

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

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

From CHPQA  
Certificate



# Dual CHPQA Certification

**Quality Certification for an existing CHP Scheme**

CHPQA Certificate No: [REDACTED]

Scheme: SITE NAME TEST  
OX11 0QR

CHPQA Scheme Reference No: 8760 B

This is to Certify that the Self-Assessment of the above CHP Scheme undertaken by TEST USER of Scheme performance during the calendar year: 2014 has been Validated under the Combined Heat and Power Quality Assurance programme and that:

1. The Total Power Capacity of this Scheme is:	0.600 MWe
and the Qualifying Power Capacity is:	0.600 MWe
2. The threshold Power Efficiency criterion for this Scheme is:	20 %
and the Power Efficiency of this Scheme is:	34.43 %
3. The Qualifying Heat Output from this Scheme is:	923 MWh
and the Heat Efficiency of this Scheme is:	10.55 %
4. The threshold Quality Index criterion for under Initial Operation is:	95
and the Quality Index of this Scheme is:	94.60
5. The Total Fuel Input to this Scheme is:	8,749 MWh
and the Qualifying Fuel Input is:	8,749 MWh
6. The Total Power Output from this Scheme is:	3,012 MWh
and the Qualifying Power Output is:	2,921 MWh
7. The fuel supply reference(s) (e.g. TRANSOCO MPR, gas meter reference nos. and/or other unique ID descriptors) for this Scheme are:	[123456789]

Station multiplied by the following ratio: the Qualifying Power Output referred to in item 6 above over the Total Power Output referred to in item 6 above.

**Quality Certification for an existing CHP Scheme for ROCs eligibility**

CHPQA Certificate No: [REDACTED]

Scheme: SITE NAME TEST  
OX11 0QR

CHPQA Scheme Reference No: 8760 B

This is to Certify that the Self-Assessment of the above CHP Scheme undertaken by TEST USER of Scheme performance during the calendar year: 2014 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:	923 MWh
and the Heat Efficiency of this Scheme is:	10.55 %
4. The threshold Quality Index criterion for this Scheme under Annual Operation is:	100
and the Quality Index of this Scheme is:	110.79
5. The Total Fuel Input to this Scheme is:	8,749 MWh
6. The Total Power Output from this Scheme is:	3,012 MWh
and the Qualifying Power Output is:	3,012 MWh
7. The Technology Type for this Scheme	Reciprocating engine
8. The Main Fuel Type for this Scheme is:	Biogas
9. The Percentage of Renewable Fuel is:	100.00 %

Station multiplied by the following ratio: the Qualifying Power Output referred to in item 9 above over the Total Power Output referred to in item 9 above.

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





# ROC Eligibility – QI Definitions

## ‘New’ Schemes

- As a result of the recent CHPQA review (more later), updated QI formulae have been developed for ‘new’ Schemes
- Such ‘new’ Schemes are those that have **not previously** been certified under CHPQA **or were certified for the first time** between 1 January and 31 December 2016 on the basis of an F3 submission. For these Schemes, the QI formulae in Table 2 of Guidance Note 44 Issue 6 must now be used

## ‘Existing’ Schemes

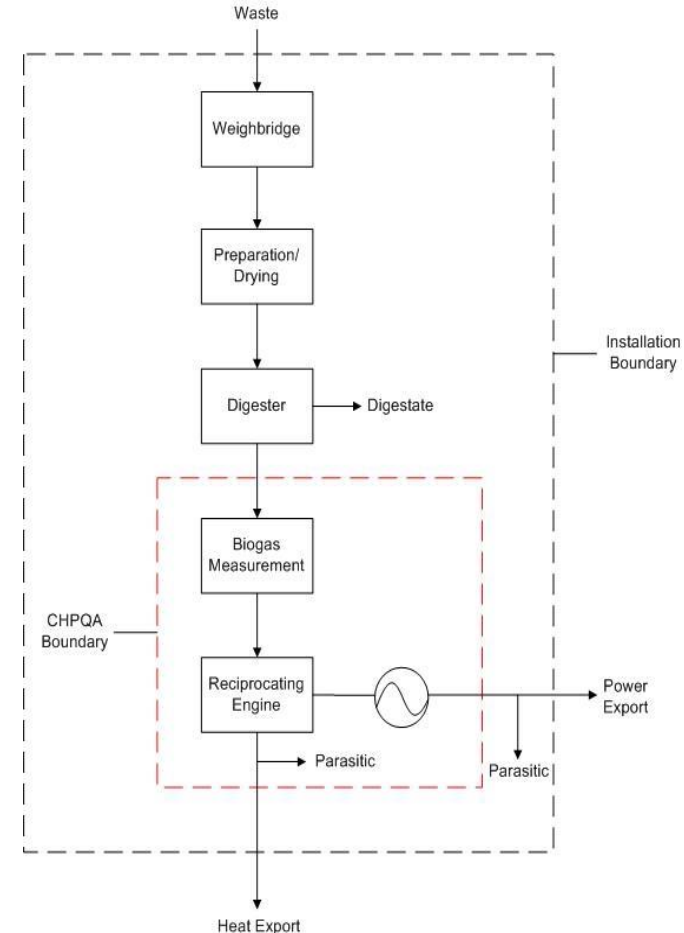
- For other Schemes, the set of QI formulae on which they were previously certified will apply. i.e. the formulae are grandfathered



# ROC Eligibility – QI Definitions

## Advanced Conversion Technologies (ACTs)

- Gasification
  - Pyrolysis
  - Anaerobic Digestion
- For biogas fired schemes, the fuel input boundary should normally be drawn at the gas inlet to RE
- Should use the Biogas QI formula





# Safeguard Provision for QI

Three policy criteria:

- The minimum primary energy saving requirement of 10% (0% for schemes <1MW electrical capacity).
- A new requirement for a minimum heat efficiency of 10% (gross calorific value).
- An overall efficiency of at least 35% (gross calorific value) for schemes >25MW electrical capacity.

Schemes that meet all 3 criteria but do not achieve a QI of 100 will be awarded a QI of 100 based on the design data, and an appropriate X value will be developed.



# QI Threshold for DH/DC schemes

## New Renewable CHP primarily supplying Heating/Cooling Networks:

- QI threshold of 95 for an initial period of operation of 5 years will be allowed
- Need a Business Plan to demonstrate this.

### Subject to :

- Achieving a QI of 100, by the 6th full calendar year or an increase by at least 5 points by the 6<sup>th</sup> full calendar year.
- Achieving this by means of network connection to heat loads in additional buildings, on additional sites or to additional industrial or commercial users.



# Contracts for Difference (CfD)



# Contracts for Difference (CfD)

- Regulations for CfDs came into force in Great Britain on 1/8/2014
- CfDs replace the RO for all new projects from 1/4/2017
- Generators are paid the difference between the 'strike price' (cost of investing in the specific low carbon technology) and the 'reference price' (average market price for electricity in GB market). If 'reference' exceeds 'strike' price, generator must pay difference.
- CfDs are awarded via allocation rounds, which government can tailor to specific technologies
  - The first allocation round was in October 2014: two EfW with CHP stations were awarded CfDs
  - Second allocation round just been announced (opening in April 2017). Technologies include:
    - Advanced Conversion technologies (with or without CHP)
    - Anaerobic Digestion (with or without CHP)
    - Dedicated Biomass with CHP



# Contracts for Difference (CfD)

CFD Administrative Strike Prices (£/MWh, 2012 prices)

Technology	2021/22	2022/23
Advanced Conversion Technologies (with or without CHP)	125	115
Anaerobic Digestion (with or without CHP), >5MW	140	135
Dedicated Biomass with CHP	115	115

## Cap on Total capacity

A cumulative maxima of **150 MW** will be applied in respect of the fuelled technologies: Dedicated Biomass with CHP, Advanced Conversion Technologies and Anaerobic Digestion.



# CHP-specific CfD Eligibility

- Dedicated Biomass and Energy from Waste generators **must** be '*with CHP*'.
- Provision for other technologies to be '*with CHP*' (ACT, AD and geothermal)
- Support paid only on the proportion of metered electrical output assessed by CHPQA to be QPO.
- Use CHP Qualifying Multiplier,  $CHPQM = QPO/TPO$ .
- Provide evidence of intended "useful heat" load in F3 submission.
- For '*with CHP*' technologies, the generator must maintain annual CHPQA certification (full or partial) including GN44 certification for the duration of the CfD.
- It is expected that biomass, but not EfW, Schemes seeking CfDs, will also be able to apply for the RHI. This is, however, set for each CfD round.





# CfD Investor Safeguard

- During the CfD contract lifetime **biomass** (but not EfW or other technologies) CHP Schemes are protected against risk of loss of heat customer(s) for up to 5 years (**5 CHPQA certification periods**)
- Under this “investor safeguard”, a plant may elect to have their CHP Qualifying Multiplier (QPO/TPO) assessed on most recent CHPQA F3 ‘design’ Certificate, rather than previous year’s operation



# Renewable Heat Incentive (RHI)

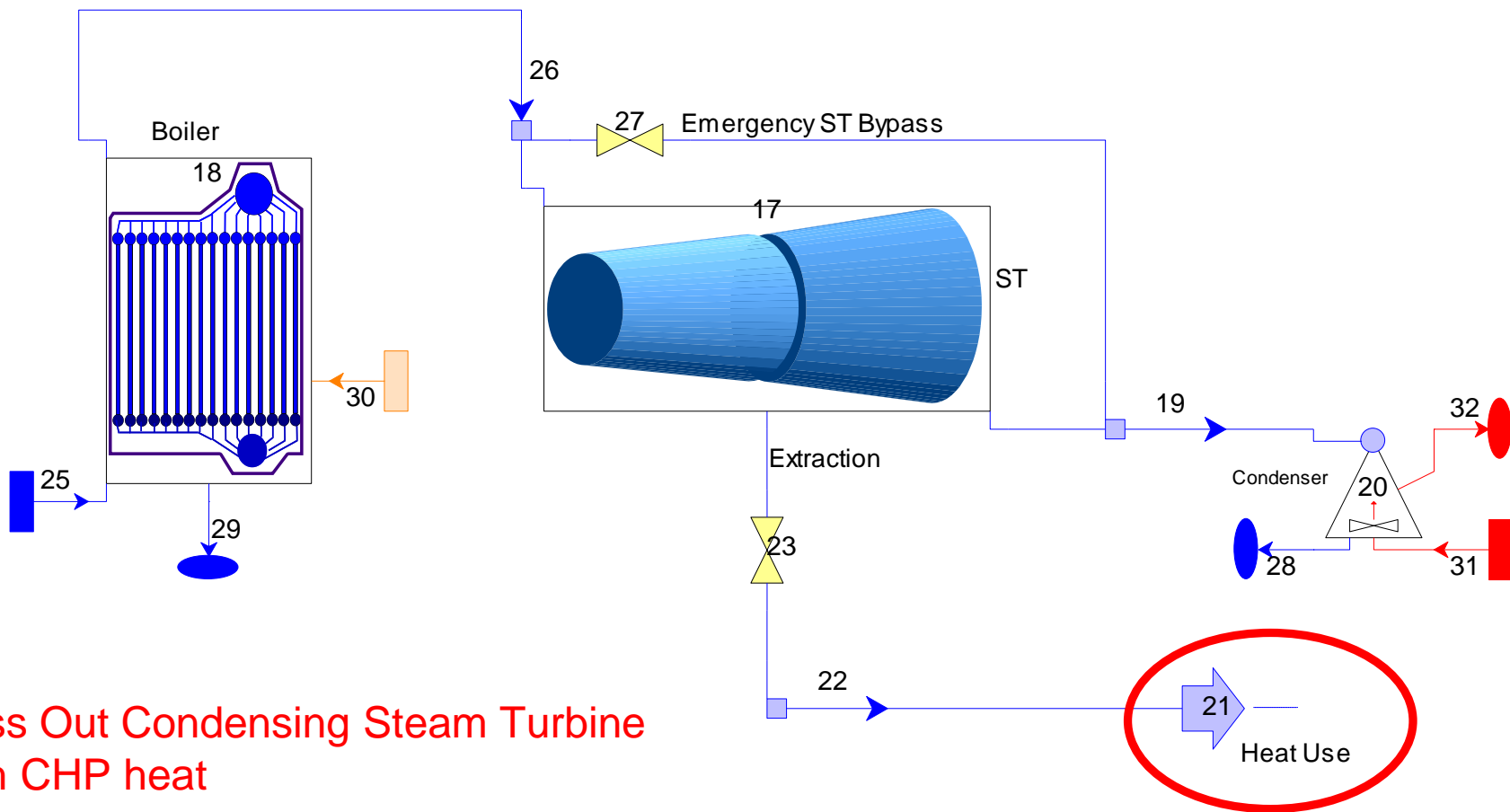


# RHI

- Current (Nov'16) tariff for solid biomass installations >1MW is 2.05 p/kWh
- The specific tariff for solid biomass GQCHP of 4.22p/kWh (Schemes commissioned before 4/12/2013 are excluded)
- Schemes need to be certified by CHPQA in order to benefit from CHP tariff
- EfW plants are only be eligible for the biomass tariff for the biomass percentage contained in the waste.
- No special CHP RHI tariffs for EfW or other fuels.
- CHP RHI eligible heat is not the same as QHO
- CHP scheme boundaries for CHPQA certification are not always the same as for RHI eligible installation
- Only heat produced via the engine/turbine can qualify for the CHP tariff,
- This needs to be metered separately.



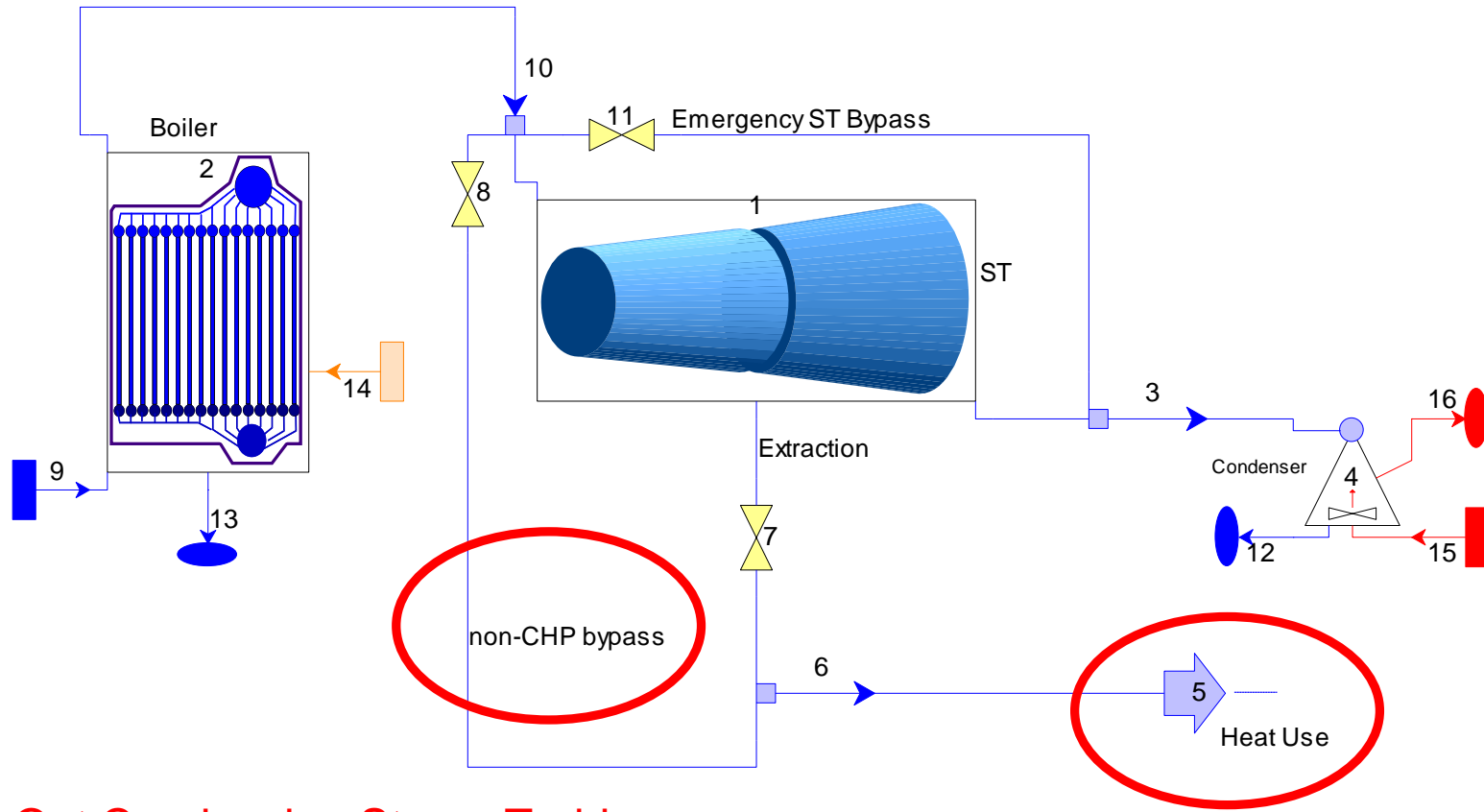
# ST Example CHP



Pass Out Condensing Steam Turbine  
with CHP heat



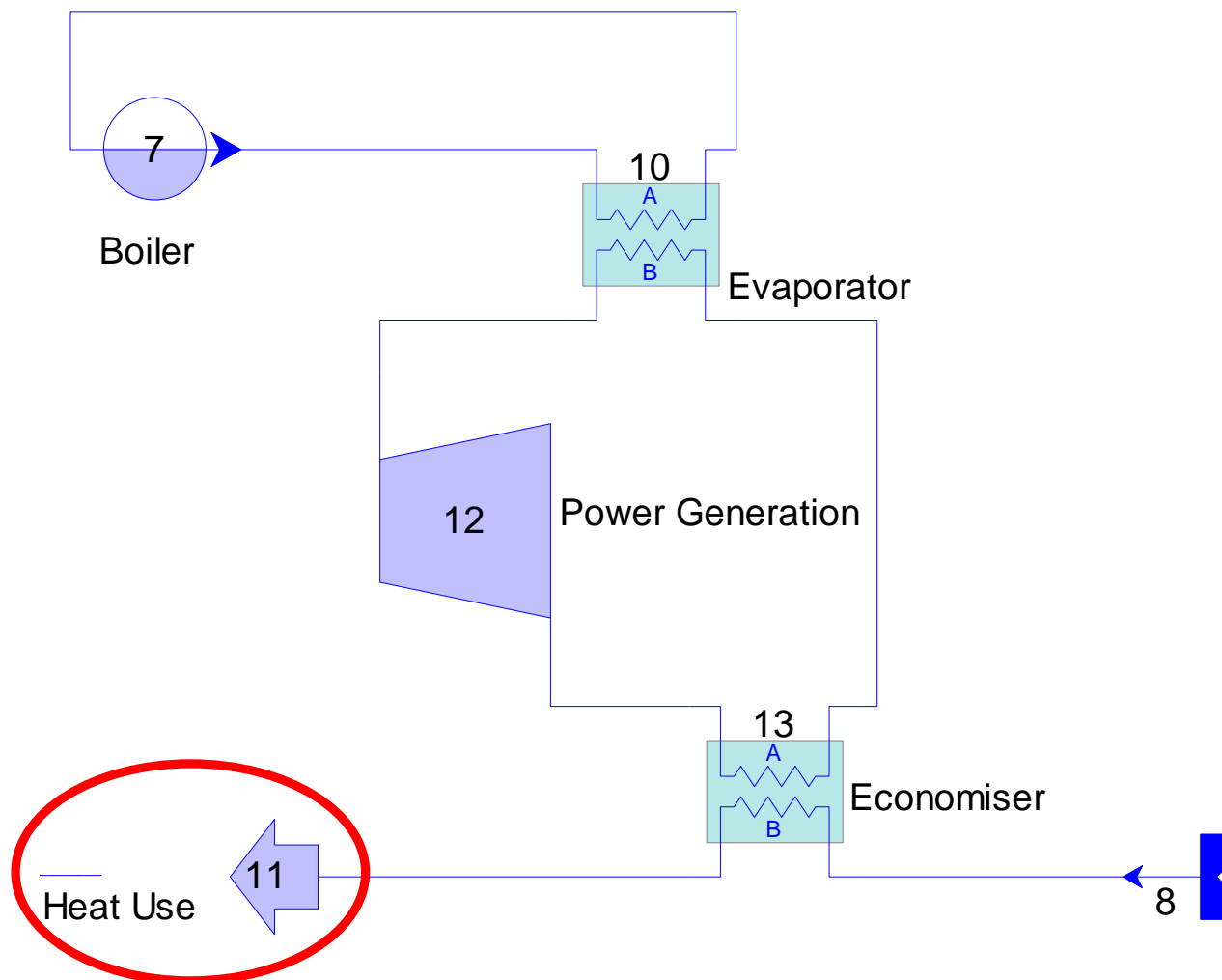
# ST Example with non-CHP Heat



Pass Out Condensing Steam Turbine  
with non-CHP heat in bypass



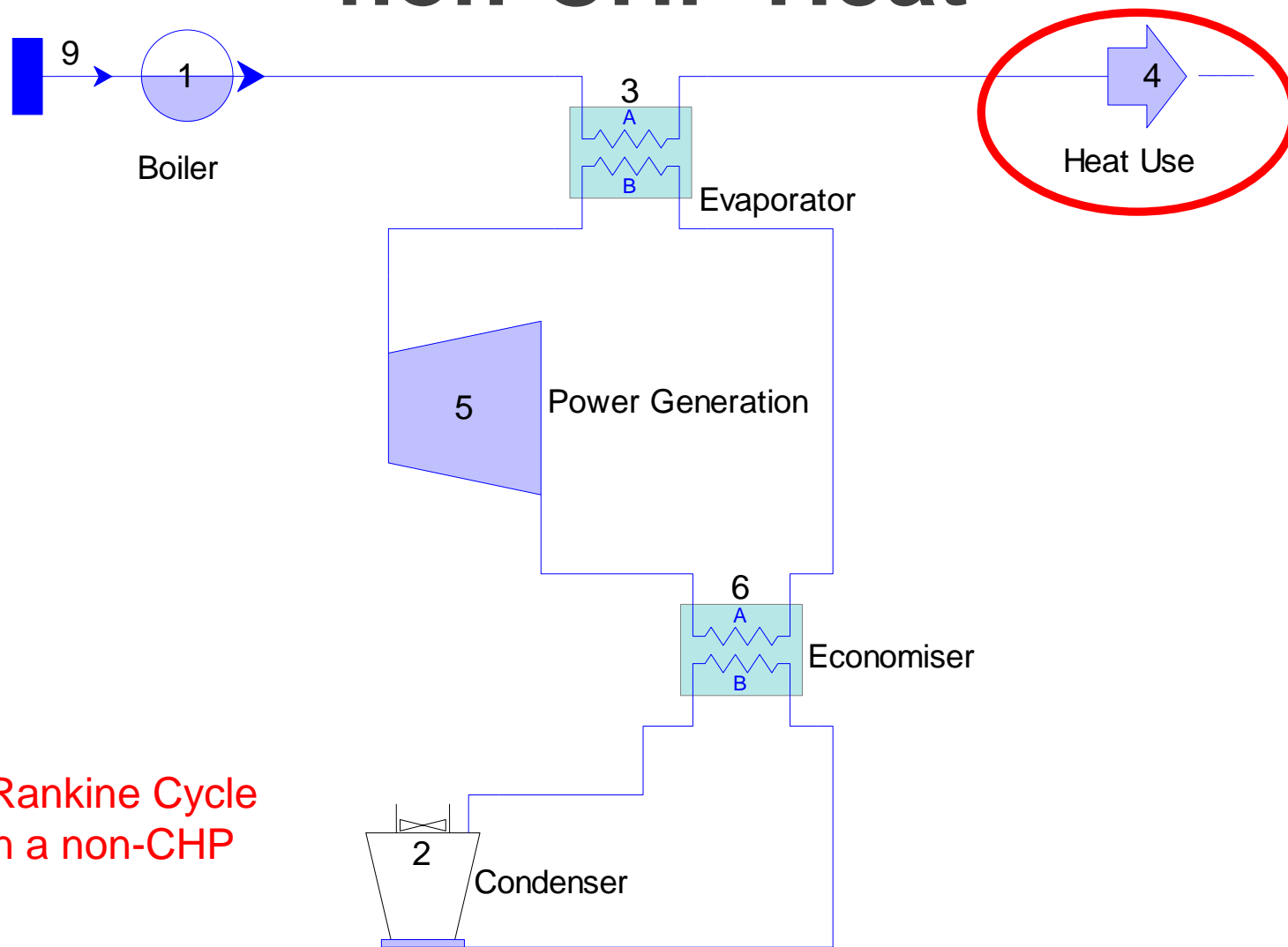
# CHP Heat



Organic Rankine  
Cycle Turbine as  
CHP mode



# non-CHP Heat



Organic Rankine Cycle  
Turbine in a non-CHP  
mode



# The RHI (Amendment) Regulations 2016

- Effective from the 1 August 2016, the government introduced a threshold of 20% power efficiency below which the heat qualifying for the RHI CHP tariff would be scaled back proportionately.
  - For example, if the power efficiency was 15%, the amount of heat that could qualify for the CHP tariff would be reduced by  $(20-15)/20 \times 100\%$ , i.e. 25%
- Introduced to address concerns that a number of Schemes with low power efficiencies and high heat to power ratios were receiving disproportionate support where significant heat was simply passing through the prime-mover
- Given feedback from the industry, the government now intends, as a transitional measure, to reduce the threshold to 10% until 1 April 2017, backdating it to 1 August 2016





# Final message

**1- Biomass CHP can obtain ROC uplift\* and ECA**

**Or**

**2- Standard ROC (no uplift) and RHI but no ECA**

**And**

**3- From 2017 can only apply for CfD & RHI but no ECA**

**\*From 1/4/2015, new biomass schemes no longer have the choice to opt for CHP 0.5 ROC uplift, only RHI support, if eligible, for heat generated. The uplift will be grandfathered but operators will still need to retain annual certification with CHPQA**