

Biomass Boilers

Summary of proposed Triple E eligibility criteria changes.

To facilitate a refinement of the eligibility criteria for Biomass Boilers it is proposed to make the following amendments:

- Condition 6 – Updated to include both status and error indication and/or fault-monitoring with additional parameters.
- Condition 8 - Further clarification provided on requirement to incorporate an automatic system to ‘trim’ the combustion air.
- Updated ‘Table 1 – Thermal Efficiency and Emissions to Increase the minimum thermal efficiency for biomass boilers in the 150kW to 500 kW range.
- Minor text changes to Conditions 1,4,7

The proposed eligibility criteria document is contained on the following pages.

Please follow this [link](#) to view the currently published eligibility criteria.

Triple E Eligibility Criteria

Category: Heating and Electricity Provision

Technology: Biomass Boilers

Biomass Boilers provide an efficient, automatic method of generating hot water, steam or other heat-transporting fluids, using carbon-neutral biomass as the fuel source. Fuel sources might include wood, or other solid fuels derived from it. The biomass boiler is considered as incorporating some or all of the following ancillary equipment such as control systems, automated fuel-feed system, induced draught (ID) and forced draught (FD) fans, and ash removal and grit arrestors.

Biomass Boilers Eligibility criteria

To be included on the Triple E Register, a biomass boiler must meet *all* the requirements set out below.

Note: *Supporting documentation that clearly demonstrates Triple E compliance according to the conditions below will be required as part of the Triple E checking process. Detailed information on the types of documents accepted can be found in the separate Supporting Documentation guidelines.*

No.	Condition
1.	All equipment and/or components must be CE-marked as required by the specific EU directive(s) and have an accompanying Declaration of Conformity.
2.	Must be a minimum size of 50kW
3.	Appropriate operating and maintenance manuals must be available for the end-user as part of the main contract of sale in order to maximise the achievement of potential efficiency improvements.

4.	<p>Must be equipped for automatic operation without the need for permanent supervision. This shall include:</p> <ul style="list-style-type: none"> • Automatic start-up and shutdown. • Ability to operate in slumber mode and to restart when the heating load demands. • Automatic fuel loading commensurate with the heat demand. • Automatic ash removal. • Automatic control of the fuel feed, and burning rate commensurate with the heat demand
5.	<p>Must incorporate a system to automatically prevent burn-back through the fuel-feed system.</p>
6.	<p>Must incorporate a status and error indication and/or fault-monitoring system which should be capable of communicating status/error/faults remotely.</p> <p>The parameters to be monitored must include:</p> <ul style="list-style-type: none"> • Low fuel hopper storage level • Blockage in the fuel feed system or stocker • High temperature in fuel feed system or stocker incorporating burn pack protection operation • Unscheduled boiler shutdown or ignition failure • Boiler hot water/thermal fluid outlet temperature or steam pressure above pre-sets • Excessive flue gas temperature <p>In most cases the fault monitoring will also include fail safe mechanisms to stop fuel feed system.</p>
7.	<p>It may be appropriate to incorporate a mechanical or pneumatic system for heat exchanger cleaning on the flue gas side, depending on the boiler size and type.</p>
8.	<p>A boiler plant with modulating output must incorporate an automatic system to 'trim' the combustion air commensurate with the oxygen content of the flue gases in line with the fuel input and the heating demand. Combustion efficiency is maximised when the fuel is completely combusted, and this is dependent on the correct supply of primary combustion air so as to minimise 'stack' losses caused by excess air.</p>
9.	<p>Must incorporate a system to reduce fuel supply to prevent over-heating of the water within the boiler in the event of a mains electricity failure.</p>

10.	<p>Efficiency and certified dust-emission levels, both measured in accordance with a recognised European standard, must achieve the minimum and maximum limits listed below when burning wood pellets or wood chips. Tests must be witnessed by or verified by an independent accredited test laboratory.</p> <p>Thermal Efficiency</p> <p>The boiler plant must demonstrate an efficiency level in line with those outlined in Table 1 below.</p> <p>Recognised standards include</p> <ul style="list-style-type: none"> • EN 303-5:2012 “Heating boilers for solid fuels, hand and automatically fired, nominal heat output of up to 500 kW. Terminology, requirements, testing and marking”. • For Boilers exceeding 500kW, BS 845-1:1987 “Methods for assessing thermal performance of boilers for steam, hot water and high temperature heat transfer fluids: Concise procedure (for shell boilers only) or equivalent¹.” <p>Emission Limits</p> <p>Boiler plant must demonstrate emissions levels meeting or surpassing the following:</p> <p>Statutory emission limit values (ELVs) for biomass combustion plants have recently changed and will apply as follows:</p> <p>The Medium Combustion Plant Directive (EU) 2015/2193 applies to plants with a rated thermal input of over 1MW but less than 50MW, excluding those covered by the Industrial Emissions Directive, 2010/75/EU (IED) (i.e. biomass boilers burning contaminated waste wood and plants of 50MW or more). Requirements are outlined in Table 2 below.</p> <p>New solid fuel boilers up to 500kWth (thermal output) are required to comply with the eco-design requirements of Directive 2009/125/EC² as implemented by Commission Regulation (EU) 2015/1189. The requirements include the ELVs outlined in Table 3 below.</p>
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Table 1. Thermal efficiency and emissions

Boiler rating	Thermal efficiency³	
	Chips	Pellets
50 -150 kW*	≥ 85%	90%
>150 – 500 kW*	≥ 86%	92%
> 500 kW**	≥ 87%	92%

*Tested at maximum continuous rated output.

¹ Other relevant standards include:

BS EN 12953-11:2003 “Shell boilers — Part 11: Acceptance tests” (for water tube boilers only)

BS EN 12952-15:2003 “Water-tube boilers and auxiliary installations. Acceptance tests”.

² <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015R1189&from=EN>

³ The efficiencies shall be measured on a ‘net’ calorific value basis.

**Tested at between 70% and 100% of maximum continuous rated output.

Table 2: Summary of MCPD ELVs for solid biomass

Boiler Rating (MWth)	Emission limit values (mg/Nm ³)		
	NO _x [†]	Dust/PM ^{††}	SO ₂
1 to ≤ 5	500	50	200 [†]
5 to ≤20	300	30	
20 to ≤50		20	

[†]Oxides of Nitrogen

^{††} Particulate matter

Table 3: ELVs for solid biomass boilers with output ≤ 500kWth

Applicability	Boiler Rating, kWth	Emission limit values (mg/Nm ³)		
		CO ^{&}	NO _x	Dust/PM
Manually stoked	≤500	700	200	60
Automatically stoked		500		40

[&] Carbon Monoxide

----- End of TRIPLE E eligibility criteria -----

Please see next section for guidance on:

- 1. Technical details required in product submission**
- 2. Supporting documentation required**

Guidance on product details and supporting documentation

The following information is not part of the official criteria document published within the relevant statutory Instrument; it has been added here for guidance purposes only in order to provide assistance with the submission of product details and the provision of the required supporting documentation.

Note: All information contained within this guidance document is subject to change without notice

Technical information required in product submission

The following are the specific technical values required as part of the product submission for this technology:

Boiler Rating (kW)

The rated heat power output in kW of the product is required. It must be entered as whole number only (do not include kW symbol). There should also be no spaces or full stops after the number submitted.

Thermal Efficiency (%)

The efficiency (%) of the product is required . It must be entered as number only without units or % sign. There should also be no spaces or full stops after the number submitted. The figure must comply with the criteria requirements for minimum efficiency values detailed in Table 1.

Dust Emission (mg/Nm³)

The dust emission (mg/Nm³) of the product is required . It must be entered as number only without units. There should also be no spaces or full stops after the number submitted. The figure must comply with the criteria requirements for minimum efficiency values detailed in Table 1.

Supporting documentation required

Described below is the list of documents that are accepted as proof of compliance for the specific Biomass Boilers condition.

Note: This information will only be requested AFTER you submit your product's basic details online

Important Notes to Product Providers

Please ensure that you read the "Important Notes to Product Providers" section at the end of this document prior to submitting documentation.

No.	Condition	Supporting Documentation Requirement
1.	All equipment and/or components must be CE-marked as required by the specific EU directive(s).	<p>Official and published manufacturer’s technical data sheet or brochure that demonstrates CE marking compliance</p> <p>OR</p> <p>A copy of an official signed declaration of conformity on headed paper that confirms CE marking compliance.</p> <p>Official declarations should explicitly state the product for which CE marking is being confirmed (i.e. do not provide a letter simply stating general compliance with the relevant Triple E condition).</p> <p>Where a document is used to demonstrate conformance for a number of products or range of products, it should clearly specify each individual product covered by that document.</p>
2.	Must be a minimum size of 50kW	Official and published manufacturer’s technical data sheet or brochure that demonstrates proof of compliance with the requirements of the condition.

No.	Condition	Supporting Documentation Requirement
3.	<p>Appropriate operating and maintenance manuals must be available for the end-user as part of the main contract of sale in order to maximise the achievement of potential efficiency improvements.</p>	<p>A copy of an official signed declaration on headed paper which confirms that the appropriate operating and maintenance manuals are provided. Where applicable, information on the availability of technical documentation to download online should be given.</p> <p>NB: A signed declaration is required to comply with this condition in all cases. Submitting copies of user manuals is not sufficient and not required by this condition.</p>
4.	<p>The plant will be equipped for automatic operation without the need for permanent supervision. This must include:</p> <ul style="list-style-type: none"> • Automatic start-up and shutdown • Ability to operate in slumber mode and to restart when the heating load demands • Automatic fuel loading commensurate with the heat/steam demand • Automatic ash removal • Automatic control of the burning rate commensurate with the heat demand 	<p>Official and published manufacturer's technical data sheet or brochure that demonstrates proof of compliance with the requirements of the condition.</p>
5.	<p>The plant must incorporate a system to automatically prevent burn-back through the fuel-feed system.</p>	<p>Official and published manufacturer's technical data sheet or brochure that demonstrates proof of compliance with the requirements of the condition.</p>

No.	Condition	Supporting Documentation Requirement
6.	<p>The plant must incorporate a status, error and fault-monitoring system which should be capable of communicating remotely a fault.</p> <p>The parameters to be monitored shall include:</p> <ul style="list-style-type: none"> • Fuel shortage or blockage • Boiler shut-down • Boiler hot water/thermal fluid outlet temperature or steam pressure • Flue gas temperature 	<p>Official and published manufacturer's technical data sheet or brochure that demonstrates proof of compliance with the requirements of the condition.</p>
7.	<p>To facilitate automatic tube cleaning, the boiler must incorporate a mechanical or pneumatic system for heat exchanger cleaning on the gas side.</p>	<p>Official and published manufacturer's technical data sheet or brochure that demonstrates proof of compliance with the requirements of the condition.</p>
8.	<p>Boiler plant with modulating output must incorporate an automatic system to 'trim' the combustion air commensurate with the oxygen content of the flue gases in line with the fuel input and the heating demand so as to minimise 'stack' losses caused by excess air.</p>	<p>Official and published manufacturer's technical data sheet or brochure that demonstrates proof of compliance with the requirements of the condition.</p>
9.	<p>The boiler will incorporate a system to prevent over-heating of the water within the boiler in the event of a mains electricity failure.</p>	<p>Official and published manufacturer's technical data sheet or brochure that demonstrates proof of compliance with the requirements of the condition.</p>

No.	Condition	Supporting Documentation Requirement
10.	The boiler efficiency and certified NO _x and dust-emission levels, both measured in accordance with a recognised European standard, must achieve the minimum and maximum limits listed in Tables 1, 2 and 3 when burning wood pellets or wood chips.	<p>Evidence of official testing by manufacturer or independent test lab carried out according to a recognised European standard verifying that the unit achieves the stated efficiency and dust emission levels.</p> <p>Test reports should be of the format described in the 'Important Notes to Product Providers' section of this document.</p>

Important notes for product providers

General

There should be a clear link between the product submitted and all supporting documentation. This will typically take the form of a *product code* or *product name* that can be cross-referenced between the submitted product and the relevant supporting documentation.

If product codes/names have been changed since publication of the supporting documentation, then you must provide official evidence of this .

If there is any deviation from these requirements, the supporting documentation will not be considered adequate for the purposes of demonstrating compliance with the criteria conditions. This will in turn delay the submission and/or result in the product not being considered eligible.

Where the Triple E criteria or help documentation makes reference to compliance with appropriate rather than specific standards, the onus is on the product provider to ensure that the supporting documentation supplied references recognised standards that apply to the submitted product, i.e. the product must be covered under the scope of a recognised standard.

If it is subsequently found that any product submitted does not meet the performance or specification criteria, it will cease to be considered eligible for the Triple E.

Note: When supplying the supporting documentation through the online process, you must ensure, when demonstrating compliance with the relevant condition, that the correct page number(s) of the document is referenced. When referencing more than one page number, add an explanatory note.

Test report

A test report must include an outline of the complete test, including:

- √ Introduction
- √ Details on test conditions
- √ The specific model details of the product tested
- √ The steps taken in the test
- √ The results
- √ Graphical representations
- √ Conclusion

All documents should be on headed paper and the document should be officially signed off. **All documentation must be in English** or include adequate translation.

Certification

Where certificates are provided, all tests must be carried out, witnessed by or accredited by an organisation that is accredited to a national accreditation body, recognised via the European Cooperation for Accreditation (preferred) or the International Accreditation Forum. **All documentation must be in English** or, include adequate translation.

Scientific equivalence

Some Triple E criteria conditions allow for scientifically equivalent tests and/or standards to be used.

If a product has not been designed, manufactured or tested to the specific standard named, then documentation relating to an equivalent internationally recognised standard may be used, where the phrase '*or scientific equivalent*' is included in the Triple E condition or help documentation.

In such applications, the onus is on the product submitter to demonstrate satisfactory equivalence of the standards. Submissions which reference such supporting documentation may take longer to process. If the product provider does not provide satisfactory evidence of equivalence, then the product will not be considered eligible. **All documentation must be in English** or include adequate translation.

Note: Where specific standards are cited in a condition or in the Triple E help documentation, then documentation demonstrating that the relevant products have been designed, manufactured or tested to these specific standards is preferred. Scientific equivalence is considered the exception rather than the norm.

Representative testing

Where test information is required for a range of technically similar products (e.g., configurations of one base product with alternative outputs for example), then – in exceptional instances – a form of representative testing may be used to reduce the number of performance tests that must be completed once *agreed in advance* with SEAI.

Such testing is where only representative products are tested from a technically similar group or range of products. Representative testing may form an acceptable basis for supporting documentation if:

- A clear correlation can be demonstrated between the tested product and a technically similar non-tested product
- and*
- Such a correlation clearly demonstrates the transferability of compliance to the non-tested product

Note: Where representative testing is used for a group or range of products, and the tested or representative product is removed from the list of eligible products then all related products must also be removed.