

BIOMASS STEAM BOILER FOR INDUSTRY > 5 MWth

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Sector	Industry: Generic Refers to a wood-fired steam boiler.
ETS / Non-ETS	Non-ETS
Type of Technology	Biomass
Description	The reference installation is a water pipe boiler with a grid that supplies steam (30 bar), using wood pellets as the reference fuel.
TRL level 2020	TRL 9 The solid biomass steam boiler is a commercial technology that is widely applied.

TECHNICAL DIMENSIONS

Capacity	Functional Unit		Value and Range								
	MWth		22.22								
Potential	MWth	NL	Current			2030			2050		
			Min	-	Max	Min	-	Max	Min	-	Max
			-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-
Market share	%		-								
Capacity utilization factor			1.00								
Full-load running hours per year			8,500								
Unit of Activity											
Technical lifetime (years)			15								
Progress ratio			-								
Explanation	<p>The functional unit refers to MWth input.</p> <p>The solid biomass potential is based on the biomass potential studies conducted by DNV GL and the Biomass Policies project. These studies looked at the biomass potential in the Netherlands. The feedstock categories included are: waste wood, forest residues, fuel wood (refers only to current fuel wood use), nature and landscape biomass, and woody/lignocelluloses dedicated crops (this category is included in the Biomass Policies project). The aforementioned studies indicate the solid biomass potential to be in the range of 41-46 PJ in 2020, increasing to 58.7-72.8 PJ in 2030.</p> <p>The import potential to the Netherlands is more difficult to determine. It will depend, amongst others, on the policy frameworks within the EU member states and outside. The biomass potential in Europe has been defined by a number of studies. The most recent ones are Biomass Policies (Elbersen et al., 2015), JRC EU-TIMES (Ruiz et al., 2015) and BioSustain (PWC, 2017). Among these studies, the lowest range (referred to as low availability) and the highest range (referred to as high availability) are observed in the JRC study. According to the JRC study, in 2020, the lowest and the highest EU total biomass potential are 8.33-18.17 EJ. In 2030, this range is 8.61-19.97 EJ and in 2050, it is 8.16-21.13 EJ. How much of this potential can be considered as import potential to the Netherlands will depend on the national policies of each country and the intra EU trade developments regarding wood chips and wood pellets. There is also wood chips and wood pellets import potential to Europe and to the Netherlands from regions outside of the EU (from the US, Canada, Russia and Ukraine, Latin and Central America etc). Biomass Policies defines the import potential as 16.67 EJ in 2030, whereas JRC defines it as 0.28-0.52 EJ, increasing to 0.94 EJ.</p>										

COSTS

Year of Euro	2015										
Investment costs	Euro per Functional Unit		Current			2030			2050		
	mIn. € / MWth		0.518			0.518			0.518		
Other costs per year	mIn. € / MWth		0.04			0.04			0.04		
	mIn. € / MWth		0.04			0.04			0.04		
Fixed operational costs per year (excl. fuel costs)	mIn. € / MWth		-			-			-		
	mIn. € / MWth		-			-			-		
Variable costs per year	mIn. € / MWth		-			-			-		
	mIn. € / MWth		-			-			-		
Costs explanation	<p>In the figures above, MWth refers to input. All costs data are converted to euro 2015</p> <p>Investment costs cover the costs regarding wood pellet storage in silos, steam boiler, SNCR installation and the dust filters. In SDE+, the costs associated with the construction of the installations (excluding the site costs) are also included in the investment costs.</p> <p>The fixed O&M costs consist of the costs for the warranty and maintenance contracts and insurance policies. Direct personnel costs are also part of the fixed O&M costs.</p>										

ENERGY IN- AND OUTPUTS

Energy carriers (per unit of main output)	Energy carrier	Unit	Current			2030			2050		
			Min	-	Max	Min	-	Max	Min	-	Max
Main output:	Heat	PJ	-0.90			-0.90			-0.90		
			Min	-	Max	Min	-	Max	Min	-	Max
			-0.90	-	-0.90	-0.90	-	-0.90	-0.90	-	-0.90
			-	-	-	-	-	-	-	-	-
Biomass (wood)	PJ	PJ	1.00			1.00			1.00		
			Min	-	Max	Min	-	Max	Min	-	Max
			1.00	-	1.00	1.00	-	1.00	1.00	-	1.00
			-	-	-	-	-	-	-	-	-
	PJ	PJ	-			-			-		
			Min	-	Max	Min	-	Max	Min	-	Max
			-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-
	PJ	PJ	-			-			-		
			Min	-	Max	Min	-	Max	Min	-	Max
			-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-

Energy in- and Outputs explanation

EMISSIONS (Non-fuel/energy-related emissions or emissions reductions (e.g. CCS))

Emissions	Substance	Unit	Current			2030			2050		
			Min	-	Max	Min	-	Max	Min	-	Max
			-			-			-		
			Min	-	Max	Min	-	Max	Min	-	Max
			-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-
			-			-			-		
			Min	-	Max	Min	-	Max	Min	-	Max
			-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-
			-			-			-		
			Min	-	Max	Min	-	Max	Min	-	Max
			-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-

Emissions explanation

REFERENCES AND SOURCES

SDE+ Eindadvies 2019
 DHV, 2017. Biomassapotentieel in Nederland. Verkennende studie naar vrij beschikbaar biomassapotentieel voor energieopwekking in Nederland. Paula Schulze, Johan Holstein, Harm Vlap. GCS.17.R.10032629.2