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Preparatory study for Steam Boilers Ecodesign



Stakeholder Meeting
Brussels, 6th March 2014

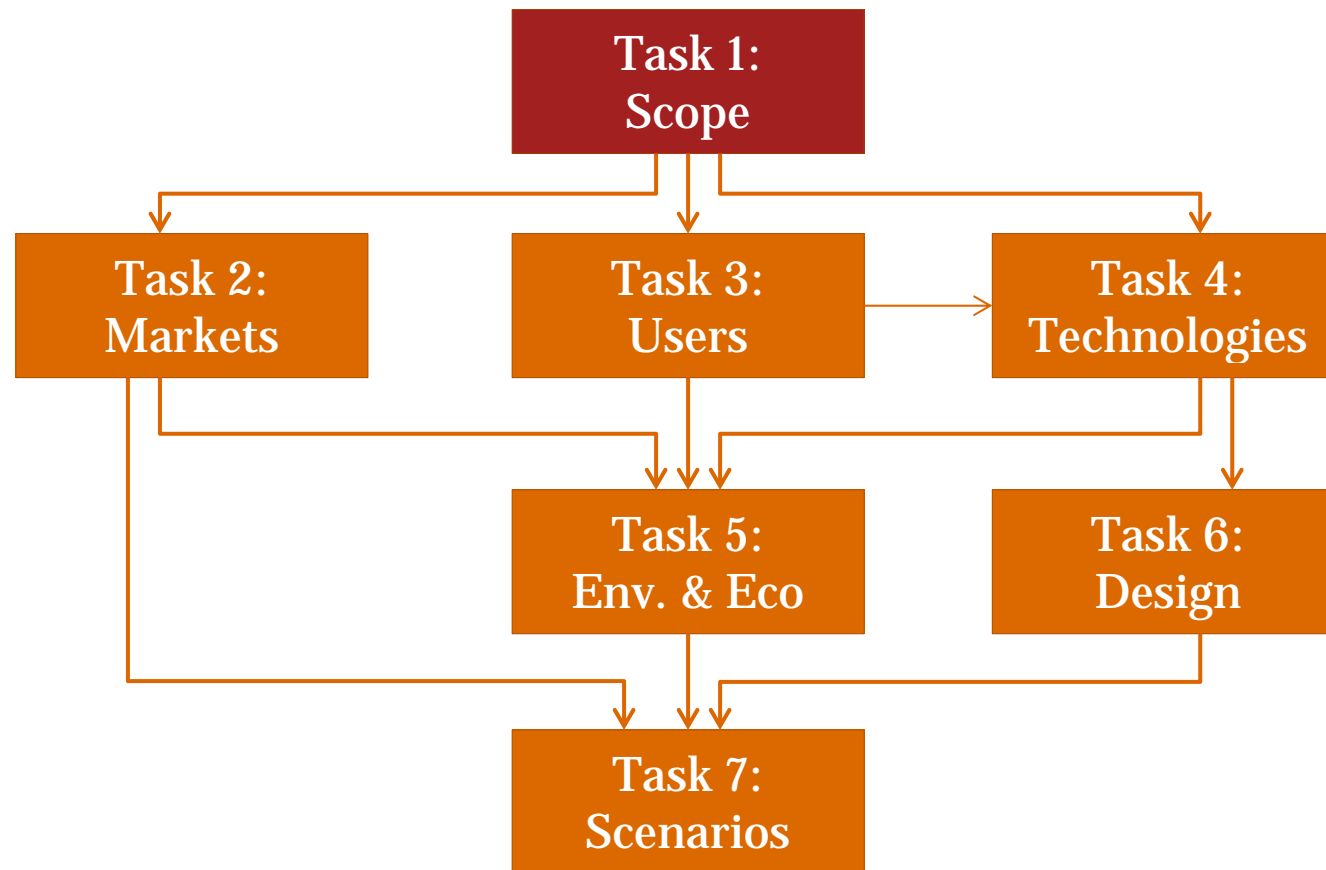
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Fraunhofer
ISI

Task 1: Scope

Tasks' structure



Agenda

Subtask 1.1: Product Scope

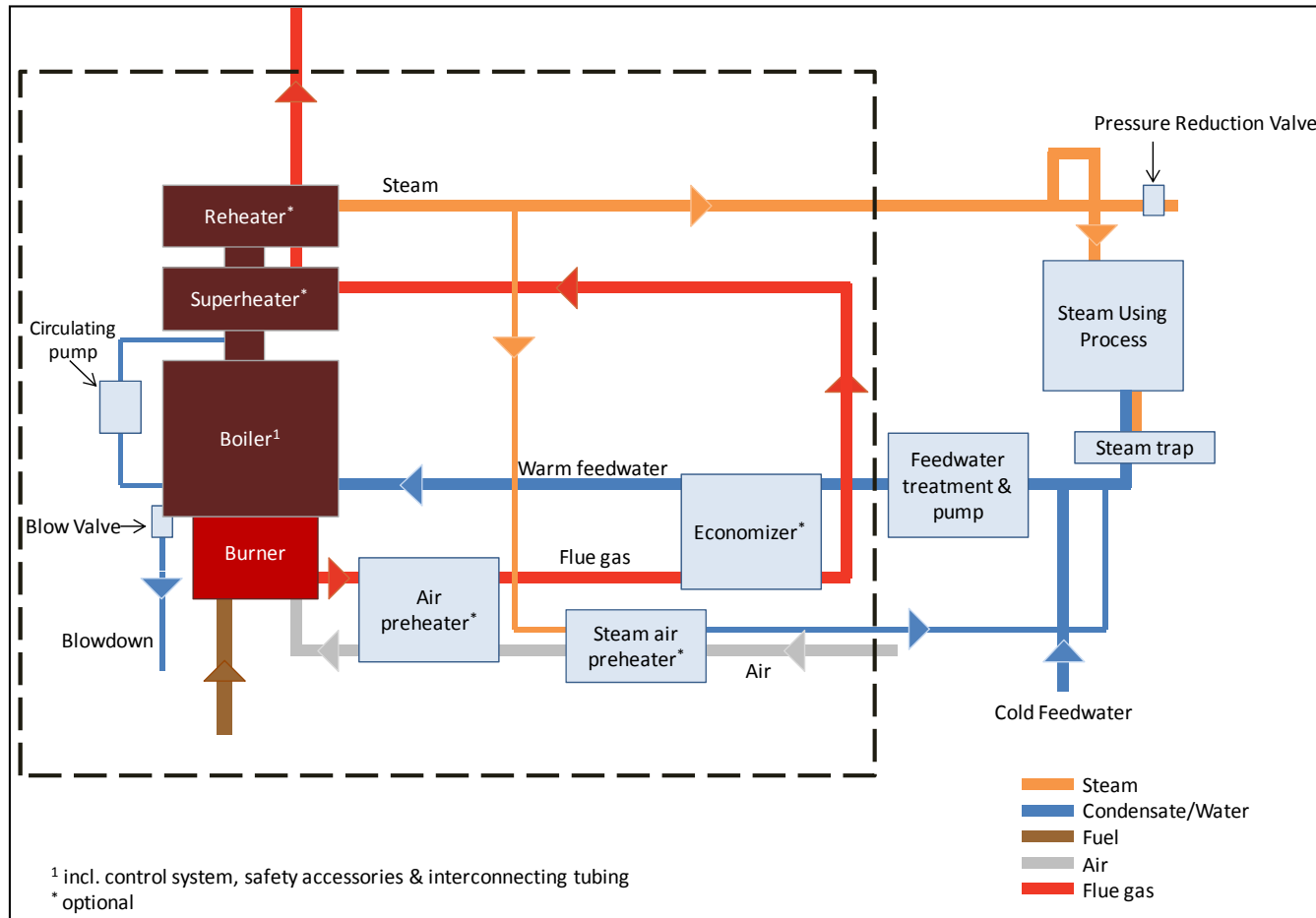
Subtask 1.2: Measurement/Test Standards

Subtask 1.3: Existing Legislation

Subtask 1.1: Product Scope

1.1

System Boundaries



PRODCOM Classification

PRODCOM category	Description	External trade nomenclature reference for 2012(HS/CN)
25.30.11.10	Watertube boilers (excluding central heating hot water boilers capable of producing low pressure steam)	8402[.11+.12]
25.30.11.50	Vapour generating boilers (including hybrid boilers) (excluding central heating hot water boilers capable of producing low pressure steam, watertube boilers)	8402 [.19(.10+.90)]
25.30.11.70	Super-heated water boilers (excluding central heating hot water boilers capable of producing low pressure steam)	8402 20

Boiler types (→ Task 4)

Fire tube boilers

- up to ~12000 kg/hr
- Low-Medium operating pressures

Water tube boilers

- up to ~120000 kg/hr
- Higher operating pressures

Boiler capacity

- Amount of steam produced over a defined time unit, (i.e. tn/hr)
- Heat produced under base load operation (in kW)

Boiler efficiency

Combustion efficiency indicates a burner's ability to burn fuel and is measured by unburned fuel and excess air in the exhaust gas stream. The amount of excess air in modern conventional boilers is approximately 10-15% for complete combustion of the fuel.

Thermal efficiency, which is used to rate the effectiveness of the transfer of the heat derived from the combustion process to the water or steam in the boiler, without taking into consideration radiation and convection heat losses. It is a measure of exclusively the heat exchanger of the boiler.

Fuel to fluid efficiency is the overall efficiency of the boiler, taking into account radiation and convection losses.

Heat content of generated vapor is expressed as the energy of the steam output of the boiler. It is a function of its pressure and temperature and determines the extent of usage capacity of the steam.

***Subtask 1.2:
Measurement/Test Standards***

1.2

European Standards (EN)

At the very moment, the only EN standards applicable for the steam boiler product group are related with the

- manufacturing,
- the structural properties and
- the quality assurance
- measurement of energy efficiency

of steam boilers (EN 12952 for tube boilers, EN 12953 for shell boilers).

International Standards (ISO)

ISO Standards regarding boilers and heaters can be found under the International Classification for Standards number 27 (Energy and heat transfer engineering).

- **ISO 16528 - Boilers and pressure vessels**
- **ISO 22968 - Forced draught oil burners**
- **ISO 22967 - Forced draught gas burners**

Subtask 1.3: Existing Legislation

1.3

Ecodesign Directive

Heat supply	ENER 1	Boilers and combiboilers
	ENER 2	Water heaters
	ENER 15	Solid fuels small combustion installations
	ENER 20	Local room heating products
	ENER 21	Central heating products using hot air to distribute heat
	ENER 22	Domestic and commercial ovens
	ENTR 4	Furnaces and Ovens

Emission Trading Directive

Steam boilers covered as

- combustion installations (> 20 MW thermal input) or
- as part of other production activities (acc. to dir. 2003/87/EC)

Only indirect effect on efficiency of steam boilers.

Industrial Emissions Directive

Capacity <> Activity	Annex I	Combustion installations
(>= 50 MW)	Covered by “combustion of fuels” (Annex I)	Covered by Subject to limit values set out in Parts 1 or 2 in Annex V
(< 50 MW)	Covered if part of other activities listed in Annex I	If two or more combustion plants add up and use or could use a common stack AND if the individual rated thermal input power is above (15 MW) (Art. 29)
Exceptions	Permit shall not include regulation on direct emissions of <u>green house gases</u> if the installation is covered by EU ETS (threshold for combustion there 20 MW or included in Annex I of ETS directives)	

Proposal for a directive on the limitation of emissions of certain pollutants into the air from medium combustion plants

Pollutant	Existing plants (for plants > 5 MW from 2025 and other plants from 2030)			New plants		
	SO ₂	NO _x	PM	SO ₂	NO _x	PM
Solid biomass	200	650	30 ⁽¹⁾	200	300	20 ⁽²⁾
Other solid fuels	400	650	30	400	300	20
Liquid fuels other than heavy fuel oil	170	200	30	170	200	20
Heavy fuel oil	350	650	30	350	300	20
Natural gas	-	200	-	-	100	-
Gaseous fuels other than natural gas	35	250	-	35	200	-
(1) 45 mg/Nm ³ for plants with a thermal input below or equal to 5 MW						
(2) 25 mg/Nm ³ for plants with a thermal input below or equal to 5 MW						

Conclusions

Task 1

1

Conclusions (1)

- Minimum nominal thermal input power of 1 MW or above
 - We exclude smaller steam boilers as according to the VHK study as 60 to 90% of the energy consumption is caused by larger boilers.
- Maximum nominal thermal input below 50 MW
 - We exclude larger boilers as they are already covered by the requirements of the IED.
- We exclude steam boilers driven by waste heat or by the incineration of waste.
 - Boilers driven by waste heat as the use of waste heat should not be penalized by regulatory means.
 - Boilers using waste as a fuel are subject to different environmental legislation and appear less relevant in terms of capacity, as they have to fulfill different technical requirements and because one of their main functions is to appropriately dispose of waste.

Conclusions (2)

- We do only consider carbon dioxide as an effluent
 - Other emissions are or will likely be covered by existing regulation as well (especially IED and draft directive on medium combustion plants).

Thanks for your attention!



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