Deliverable Report

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Project acronym: STEAM UP

Project title: Steam and Management Under Pressure

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Deliverable Number: Deliverable 2.2
Deliverable Title: Initial information data sets for Bench Marking

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Description of the Deliverable:
This deliverables consist of data sets collected at enterprises in the partner countries that represent the (energy efficiency) performance of steam boilers. Data are, as far as practically available at the enterprises, collected in an excel data sheet (one for each enterprise).

Summary
The objective of this deliverable is to collect a representative set of data to benchmark the steam efficiency performance of individual enterprises with their peers. It is the objective to bench mark the enterprises on 2 or 3 parameters that represent the steam performance of the enterprises, under the condition that sufficient representative data can practically be made available. Primary focus was on the following parameters:

- Efficiency of the steam boiler [%]
- Steam production efficiency (caloric value of steam generated/caloric value of fuel) [GJ/GJ]
- Overall steam use efficiency [kg steam produced/product (piece, kg, m^2)]

A total of **54** initial data sets were collected. The efficiency of the steam boiler could be obtained in almost 94 % of the cases however the other two parameters are less often available, respectively in 25 (46%) and 26 (48%) of the assessed enterprises.
Apart from the above mentioned parameters a set of **14** additional parameters was inventoried. This in order to get a complete as possible picture of steam boiler operation and performance in Europe. This information will in the course of the project be used to do (trend) analysis on steam boiler operation and performance.

General information

Country	SPAIN
Company number	1
Sector	Food Industry

Information Steam System

Installed Capacity	1000	[MWth]		
System	Open	X	Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	85	[%]		
Steam production efficiency	4,2	[GJ/Ton produced steam]		
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water]	10,3	[°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]		
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]		
- Alternativ when above not available	0,8	[kWh fuel for steam boiler / kg final product]		

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]				
Nominal steam capacity	1000	[tons/hour]				
Size of boiler	1000	[MWth]				
Boiler Pressure level	8	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	2200	[hours/year]				
Kind of control		[CO/O_2]				
Exhaust Gas Temperature	205	[°C] after economizers	economizer	yes		no X
O_2 level in exhaust gas in		[%]				
Rate of condensate return	0	[%]	at [temperature of condensate return]			[°C]
Rate of direct used steam	100	[%]				
Leakage detection steam traps	yes	no X	frequency			[times/year]

General information

Country	SPAIN
Company number	2
Sector	Food industry

Information Steam System

Installed Capacity	1,1	[MWth]		
System	Open		Closed	X

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	82	[%]		
Steam production efficiency	2,5	MJ/kg steam		
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water]	10,3	[°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]		
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]		
- Alternativ when above not available	0,45	kWh fuel/ kg final product		

Additional Bench Mark Data (collect when available)

Kind of fuel	diesel oil	[gas, oil, biomass]				
Nominal steam capacity	1500	[tons/hour]				
Size of boiler	1,1	[MWth]				
Boiler Pressure level	6,5	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	8000	[hours/year]				
Kind of control		[CO/O_2]				
Exhaust Gas Temperature	200	[°C] after economizers	economizer	yes		no X
O_2 level in exhaust gas in		[%]				
Rate of condensate return	70	[%]	at [temperature of condensate return]		96	[°C]
Rate of direct used steam	0	[%]				
Leakage detection steam traps	yes	no X	frequency			[times/year]

General information

Country	Spain
Company number	3
Sector	Chemical

Information Steam System

Installed Capacity		2,5	[MWth]		
System	Open			Closed	X

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	87	[%]		
Steam production efficiency	2,5	[GJ/Ton steam]		
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water]	10,4	[°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]		
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]		
- Alternativ when above not available	0,02	[kWh fuel /piece]		

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]				
Nominal steam capacity	2	[tons/hour]				
Size of boiler	2,5	[MWth]				
Boiler Pressure level	7	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	2500	[hours/year]				
Kind of control		[CO/O_2]				
Exhaust Gas Temperature	210	[°C] after economizers	economizer	yes		no X
O_2 level in exhaust gas in		[%]				
Rate of condensate return	80	[%]	at [temperature of condensate return]		92	[°C]
Rate of direct used steam	0	[%]				
Leakage detection steam traps	yes X	no	frequency		1	[times/year]

General information

Country	SPAIN
Company number	4
Sector	Food infustry - Meat processing

Information Steam System

Installed Capacity	8,1	[MWth]		
System	Open		Closed	X

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	85	[%]		
Steam production efficiency	3,8	[GJ/T produced steam]		
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water]	9,3	[°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]		
Overall steam use efficiency	0,38	kWh fuel/ kg final product		
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]		

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]				
Nominal steam capacity	9,4	[tons/hour]				
Size of boiler	8,1	[MWth]				
Boiler Pressure level	8	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	7000	[hours/year]				
Kind of control	O2	[CO/O_2]				
Exhaust Gas Temperature	212	[°C] after economizers	economizer	yes		no X
O_2 level in exhaust gas in		[%]				
Rate of condensate return	82	[%]	at [temperature of condensate return]		98	[°C]
Rate of direct used steam	15	[%]				
Leakage detection steam traps	yes X	no	frequency		2	[times/year]

General information

Country	SPAIN
Company number	5
Sector	Food industry

Information Steam System

Installed Capacity	0,5	[MWth]		
System	Open	X	Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	82	[%]
Steam production efficiency	2,1	GJ/T produced steam
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] 9,3 [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency	0,35	kWh fuel/ kg final product
- Alternativ when above not available	0,14	[kWh fuel for steam boiler / kg final product

Additional Bench Mark Data (collect when available)

Kind of fuel	diesel oil	[gas, oil, biomass]
Nominal steam capacity	0,6	[tons/hour]
Size of boiler	0,5	[MWth]
Boiler Pressure level	8	[barg] (pressure referred to atmosphere (1 bar absolute)
Boiler operation	2200	[hours/year]
Kind of control		[CO/O_2]
Exhaust Gas Temperature	208	[°C] after economizers
O_2 level in exhaust gas in		[%]
Rate of condensate return		[%]
Rate of direct used steam	100	[%]
Leakage detection steam traps	yes X	no X

economizer yes [ ] no X

at [temperature of condensate return] [ ] [°C]

frequency [ ] [times/year]

General information

Country	SPAIN
Company number	6
Sector	Beverage industry

Information Steam System

Installed Capacity		1,2	[MWth]		
System	Open	X	Closed	X	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	86	[%]
Steam production efficiency	1,32	[GJ/T produced steam]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] 9,3 [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency	0,11	kWh fuel/ L final product
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]						
Nominal steam capacity	1,3	[tons/hour]						
Size of boiler	1,2	[MWth]						
Boiler Pressure level	6	[barg] (pressure referred to atmosphere (1 bar absolute)						
Boiler operation	1000	[hours/year]						
Kind of control		[CO/O_2]						
Exhaust Gas Temperature	194	[°C] after economizers	economizer	yes		no	X	
O_2 level in exhaust gas in		[%]						
Rate of condensate return	65	[%]	at [temperature of condensate return]		95	[°C]		
Rate of direct used steam		[%]						
Leakage detection steam traps	yes X	no	frequency		0,5	[times/year]		

General information

Country	SPAIN
Company number	7
Sector	Chemical industry

Information Steam System

Installed Capacity	10	[MWth]		
System	Open		Closed	X

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	86	[%]		
Steam production efficiency	10,9	[GJ/T produced steam]		
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water]	10,3	[°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]		
Overall steam use efficiency	0,53	[kg steam/ per product (piece, kg, m2)]		
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]		

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]				
Nominal steam capacity	13,3	[tons/hour]				
Size of boiler	10	[MWth]				
Boiler Pressure level	8	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	8500	[hours/year]				
Kind of control		[CO/O_2]				
Exhaust Gas Temperature	216	[°C] after economizers	economizer	yes		no X
O_2 level in exhaust gas in		[%]				
Rate of condensate return	87	[%]	at [temperature of condensate return]		95	[°C]
Rate of direct used steam	0	[%]				
Leakage detection steam traps	yes X	no	frequency		1	[times/year]

General information

Country	SPAIN
Company number	8
Sector	Food industry

Information Steam System

Installed Capacity	10,9	[MWth]		
System	Open	X	Closed	X

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	88	[%]		
Steam production efficiency	0,75	[GJ/kg produced steam]		
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water]	11	[°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]		
Overall steam use efficiency	0,4	[kWh fuel/ kg final product]		
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]		

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]				
Nominal steam capacity	13,5	[tons/hour]				
Size of boiler	10,9	[MWth]				
Boiler Pressure level	8	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	2750	[hours/year]				
Kind of control	O2	[CO/O_2]				
Exhaust Gas Temperature	212	[°C] after economizers	economizer	yes	X	no
O_2 level in exhaust gas in		[%]				
Rate of condensate return	80	[%]	at [temperature of condensate return]	94	[°C]	
Rate of direct used steam	10	[%]				
Leakage detection steam traps	yes X	no	frequency	1	[times/year]	

General information

Country	SPAIN
Company number	9
Sector	Food industry

Information Steam System

Installed Capacity	1,6	[MWth]		
System	Open	X	Closed	X

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	88	[%]
Steam production efficiency	2,13	[GJ/ton produced steam]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] 10,3 [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency	0,14	kWh fuel/ kg final product
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	LPG	[gas, oil, biomass]				
Nominal steam capacity	2,13	[tons/hour]				
Size of boiler	1,6	[MWth]				
Boiler Pressure level	8	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	8500	[hours/year]				
Kind of control		[CO/O_2]				
Exhaust Gas Temperature	203	[°C] after economizers	economizer	yes	X	no
O_2 level in exhaust gas in		[%]				
Rate of condensate return	68	[%]	at [temperature of condensate return]		88	[°C]
Rate of direct used steam	30	[%]				
Leakage detection steam traps	yes X	no	frequency		5	[times/year]

General information

Country	SPAIN
Company number	10
Sector	Beverage industry

Information Steam System

Installed Capacity	4	[MWth]			
System	Open	X	Closed	X	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	85	[%]
Steam production efficiency	2,6	[GJ/kg produced steam]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] 9,3 [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available	12,11	[m³ gas for steam boiler / ton product]

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]					
Nominal steam capacity	5,5	[tons/hour]					
Size of boiler	4	[MWth]					
Boiler Pressure level	10	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	2000	[hours/year]					
Kind of control	O2	[CO/O_2]					
Exhaust Gas Temperature	220	[°C] after economizers	economizer	yes		no	X
O_2 level in exhaust gas in		[%]					
Rate of condensate return	30	[%]	at [temperature of condensate return]		98	[°C]	
Rate of direct used steam	60	[%]					
Leakage detection steam traps	yes X	no	frequency		1	[times/year]	

General information

Country	Austria
Company number	1
Sector	Laundry

Information Steam System

Installed Capacity		3,25	[MWth]		
System	Open	Open	Closed		

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	97	[%]
Steam production efficiency		[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel		Gas	[gas, oil, biomass]				
Nominal steam capacity		5	[tons/hour]				
Size of boiler		3,25	[MWth]				
Boiler Pressure level		10	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation		4500	[hours/year]				
Kind of control		modulated	[CO/O_2]				
Exhaust Gas Temperature		100	[°C] after economizers	economizer	yes	yes	no
O_2 level in exhaust gas in		2,40	[%]				
Rate of condensate return		70	[%]	at [temperature of condensate return]		[°C]	
Rate of direct used steam		30	[%]				
Leakage detection steam traps	yes	yes	no	frequency	1	[times/year]	

General information

Country	Austria
Company number	5
Sector	Dairy

Information Steam System

Installed Capacity		6,2	[MWth]	
System	Open	Open	Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	97	[%]
Steam production efficiency		[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	Gas	[gas, oil, biomass]	
Nominal steam capacity	10	[tons/hour]	
Size of boiler	6,2	[MWth]	
Boiler Pressure level	10	[barg] (pressure referred to atmosphere (1 bar absolute)	
Boiler operation	8600	[hours/year]	
Kind of control	Modulated	[CO/O_2]	
Exhaust Gas Temperature	130	[°C] after economizers	economizer yes yes no
O_2 level in exhaust gas in	4,4	[%]	
Rate of condensate return	80	[%]	at [temperature of condensate return] [°C]
Rate of direct used steam	20	[%]	
Leakage detection steam traps	yes	no	frequency [times/year]

General information

Country	Austria
Company number	11
Sector	Laundry

Information Steam System

Installed Capacity	3,927	[MWth]		
System	Open	X	Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	93,5	[%]
Steam production efficiency		[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	Gas	[gas, oil, biomass]				
Nominal steam capacity		[tons/hour]				
Size of boiler	3,927	[MWth]				
Boiler Pressure level	14,5	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	4500	[hours/year]				
Kind of control	Modulated	[CO/O_2]				
Exhaust Gas Temperature	130	[°C] after economizers	economizer	yes	Yes	no
O_2 level in exhaust gas in	5,2	[%]				
Rate of condensate return		[%]	at [temperature of condensate return]		[°C]	
Rate of direct used steam		[%]				
Leakage detection steam traps	yes	no	frequency	1	[times/year]	

General information

Country	Austria
Company number	12
Sector	Laundry

Information Steam System

Installed Capacity	3,935	[MWth]			
System	Open	X	Closed		

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	86,8	[%]
Steam production efficiency		[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	Gas	[gas, oil, biomass]					
Nominal steam capacity		[tons/hour]					
Size of boiler	3,935	[MWth]					
Boiler Pressure level	16	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	4500	[hours/year]					
Kind of control		[CO/O_2]					
Exhaust Gas Temperature	220before ECO	[°C] after economizers	economizer	yes	Yes	no	
O_2 level in exhaust gas in	4	[%]					
Rate of condensate return		[%]	at [temperature of condensate return]			[°C]	
Rate of direct used steam		[%]					
Leakage detection steam traps	yes yes		no	frequency	1	[times/year]	

General information

Country	Austria
Company number	13
Sector	Laundry

Information Steam System

Installed Capacity	1,95	[MWth]		
System	Open	X	Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	89,7	[%]
Steam production efficiency		[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	Gas	[gas, oil, biomass]					
Nominal steam capacity	2,6	[tons/hour]					
Size of boiler	1,95	[MWth]					
Boiler Pressure level	16	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	5000	[hours/year]					
Kind of control	Modulated	[CO/O_2]					
Exhaust Gas Temperature	227	[°C] after economizers	economizer	yes		no	No
O_2 level in exhaust gas in	3,5	[%]					
Rate of condensate return		[%]	at [temperature of condensate return]			[°C]	
Rate of direct used steam		[%]					
Leakage detection steam traps	yes X	no	frequency	1	[times/year]		

General information

Country	Austria
Company number	14
Sector	Laundry

Information Steam System

Installed Capacity		3,26	[MWth]		
System	Open	X	Closed		

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	88,5	[%]
Steam production efficiency		[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	Gas	[gas, oil, biomass]					
Nominal steam capacity		[tons/hour]					
Size of boiler	3,26	[MWth]					
Boiler Pressure level	14	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	4500	[hours/year]					
Kind of control	Modulated	[CO/O_2]					
Exhaust Gas Temperature	229before ECO	[°C] after economizers	economizer	yes	Yes	no	
O_2 level in exhaust gas in	4,6	[%]					
Rate of condensate return		[%]	at [temperature of condensate return]			[°C]	
Rate of direct used steam		[%]					
Leakage detection steam traps	yes	yes	no		frequency	1	[times/year]

General information

Country	Austria
Company number	15
Sector	Laundry

Information Steam System

Installed Capacity		1,3	[MWth]		
System	Open	X	Closed		

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	93,5	[%]
Steam production efficiency		[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	Gas	[gas, oil, biomass]					
Nominal steam capacity	2	[tons/hour]					
Size of boiler	1,3	[MWth]					
Boiler Pressure level	13	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	4500	[hours/year]					
Kind of control	Modulated	[CO/O_2]					
Exhaust Gas Temperature	125	[°C] after economizers	economizer	yes	X	no	
O_2 level in exhaust gas in	4	[%]					
Rate of condensate return		[%]	at [temperature of condensate return]			[°C]	
Rate of direct used steam		[%]					
Leakage detection steam traps	yes X	no	frequency	1	[times/year]		

General information

Country	Austria
Company number	16
Sector	Laundry

Information Steam System

Installed Capacity		2	[MWth]	
System	Open		Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	91,5	[%]
Steam production efficiency		[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	Gas	[gas, oil, biomass]					
Nominal steam capacity	3,2	[tons/hour]					
Size of boiler	2	[MWth]					
Boiler Pressure level	13	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	4500	[hours/year]					
Kind of control	Modulated	[CO/O_2]					
Exhaust Gas Temperature	170	[°C] after economizers	economizer	yes	X	no	
O_2 level in exhaust gas in	7	[%]					
Rate of condensate return		[%]	at [temperature of condensate return]			[°C]	
Rate of direct used steam		[%]					
Leakage detection steam traps	yes X	no	frequency	1	[times/year]		

General information

Country	Austria
Company number	Kunde 17
Sector	Kesselhaus

Information Steam System

Installed Capacity		7,41	[MWth]		
System	Open	X	Closed		

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	89,1	[%]
Steam production efficiency		[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	Gas	[gas, oil, biomass]					
Nominal steam capacity		[tons/hour]					
Size of boiler		[MWth]					
Boiler Pressure level	13	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	4500	[hours/year]					
Kind of control	Modulated	[CO/O_2]					
Exhaust Gas Temperature	245	[°C] after economizers	economizer	yes	Yes	no	
O_2 level in exhaust gas in	2,8	[%]					
Rate of condensate return		[%]	at [temperature of condensate return]			[°C]	
Rate of direct used steam		[%]					
Leakage detection steam traps	yes	no	frequency			[times/year]	

General information

Country	ITALY
Company number	1
Sector	PAPER MILL

Information Steam System

Installed Capacity: NOT AVAILABLE [MWth]

System: Open [ ] Closed [X]

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	90%	[%]
Steam production efficiency	NOT AVAILABLE	[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] 80 [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency	1,6	[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	GAS	[gas, oil, biomass]
Nominal steam capacity	80	[tons/hour] **3 BOILERS**
Size of boiler		[MWth]
Boiler Pressure level	10	[barg] (pressure referred to atmosphere (1 bar absolute)
Boiler operation	8300	[hours/year]
Kind of control		[CO/O_2]
Exhaust Gas Temperature		[°C] after economizers economizer yes [ ] no [ ]
O_2 level in exhaust gas in		[%]
Rate of condensate return	95	[%] at [temperature of condensate return] 80 [°C]
Rate of direct used steam		[%]
Leakage detection steam traps	yes X	no [ ] frequency n.a. [times/year]

General information

Country	ITALY
Company number	2
Sector	PAPER MILL

Information Steam System

Installed Capacity	NOT AVAILABLE	[MWth]		
System	Open		Closed	X

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	92%	[%]
Steam production efficiency		[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency	1,4	[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	GAS	[gas, oil, biomass]				
Nominal steam capacity	19	[tons/hour]				
Size of boiler		[MWth]				
Boiler Pressure level	10	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	8200	[hours/year]				
Kind of control		[CO/O_2]				
Exhaust Gas Temperature	105	[°C] after economizers	economizer	yes	X	no
O_2 level in exhaust gas in		[%]				
Rate of condensate return	95	[%]	at [temperature of condensate return]		70	[°C]
Rate of direct used steam		[%]				
Leakage detection steam traps	yes	no	frequency			[times/year]

General information

Country	ITALY
Company number	3
Sector	PAPER MILL

Information Steam System

Installed Capacity	NOT AVAILABLE	[MWth]		
System	Open		Closed	X

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	91%	[%]		
Steam production efficiency	NOT AVAILABLE	[GJ/GJ]		
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water]	80	[°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]		
Overall steam use efficiency	1,5	[kg steam/ per product (piece, kg, m2)]		
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]		

Additional Bench Mark Data (collect when available)

Kind of fuel	GAS	[gas, oil, biomass]				
Nominal steam capacity	6	[tons/hour]				
Size of boiler		[MWth]				
Boiler Pressure level	11	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	8100	[hours/year]				
Kind of control		[CO/O_2]				
Exhaust Gas Temperature	105	[°C] after economizers	economizer	yes	x	no
O_2 level in exhaust gas in		[%]				
Rate of condensate return		[%]	at [temperature of condensate return]			[°C]
Rate of direct used steam		[%]				
Leakage detection steam traps	yes	no	frequency			[times/year]

General information

Country	ITALY
Company number	4
Sector	PAPER MILL

Information Steam System

Installed Capacity: NOT AVAILABLE [MWth]

System: Open [ ] Closed [X]

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	91%	[%]
Steam production efficiency	NOT AVAILABLE	[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] 70/80 [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency	n.a.	[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	GAS	[gas, oil, biomass]
Nominal steam capacity	from 55 to 80	[tons/hour]
Size of boiler		[MWth]
Boiler Pressure level	40	[barg] (pressure referred to atmosphere (1 bar absolute)
Boiler operation	8300	[hours/year]
Kind of control		[CO/O_2]
Exhaust Gas Temperature		[°C] after economizers economizer yes X no [ ]
O_2 level in exhaust gas in		[%]
Rate of condensate return	95	[%] at [temperature of condensate return] 70/80 [°C]
Rate of direct used steam		[%]
Leakage detection steam traps	yes [ ]	no [ ] frequency [ ] [times/year]

General information

Country	ITALY
Company number	5
Sector	REFINERY

Information Steam System

Installed Capacity: NOT AVAILABLE [MWth]

System: Open [ ] Closed [ ]

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	92%	[%]
Steam production efficiency	n.a.	[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [ ] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	GAS	[gas, oil, biomass]
Nominal steam capacity	31	[tons/hour]
Size of boiler	24	[MWth]
Boiler Pressure level	15	[barg] (pressure referred to atmosphere (1 bar absolute)
Boiler operation	8300	[hours/year]
Kind of control		[CO/O_2]
Exhaust Gas Temperature	150	[°C] after economizers
O_2 level in exhaust gas in		[%]
Rate of condensate return		[%] at [temperature of condensate return] 110 [°C]
Rate of direct used steam		[%]
Leakage detection steam traps	yes x	no [ ] frequency 1 [times/year]

economizer yes X no [ ]

General information

Country	ITALY
Company number	6
Sector	PAPER MILL

Information Steam System

Installed Capacity	NOT AVAILABLE	[MWth]		
System	Open		Closed	X

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	90%	[%]		
Steam production efficiency	NOT AVAILABLE	[GJ/GJ]		
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water]	105	[°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]		
Overall steam use efficiency	1,3	[kg steam/ per product (piece, kg, m2)]		
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]		

Additional Bench Mark Data (collect when available)

Kind of fuel	GAS	[gas, oil, biomass]				
Nominal steam capacity	21,6	[tons/hour]				
Size of boiler		[MWth]				
Boiler Pressure level	20	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	8300	[hours/year]				
Kind of control		[CO/O_2]				
Exhaust Gas Temperature		[°C] after economizers	economizer	yes		no
O_2 level in exhaust gas in		[%]				
Rate of condensate return	95	[%]	at [temperature of condensate return]		105	[°C]
Rate of direct used steam		[%]				
Leakage detection steam traps	yes	no	frequency			[times/year]

General information

Country	ITALY
Company number	7
Sector	PAPER MILL

Information Steam System

Installed Capacity	NOT AVAILABLE	[MWth]		
System	Open		Closed	X

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	91%	[%]
Steam production efficiency	NOT AVAILABLE	[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency	0,7	[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	GAS	[gas, oil, biomass]
Nominal steam capacity	12,5	[tons/hour]
Size of boiler		[MWth]
Boiler Pressure level	10	[barg] (pressure referred to atmosphere (1 bar absolute)
Boiler operation	8400	[hours/year]
Kind of control		[CO/O_2]
Exhaust Gas Temperature	165	[°C] after economizers
O_2 level in exhaust gas in		[%]
Rate of condensate return	95	[%]
Rate of direct used steam		[%]
Leakage detection steam traps	yes	no

economizer yes X no

at [temperature of condensate return] [°C]

frequency [times/year]

General information

Country	ITALY
Company number	8
Sector	PAPER MILL

Information Steam System

Installed Capacity	NOT AVAILABLE	[MWth]		
System	Open		Closed	X

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	90%	[%]
Steam production efficiency	NOT AVAILABLE	[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency	1,55	[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	GAS	[gas, oil, biomass]				
Nominal steam capacity	60	[tons/hour]				
Size of boiler		[MWth]				
Boiler Pressure level	10	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	8100	[hours/year]				
Kind of control		[CO/O_2]				
Exhaust Gas Temperature		[°C] after economizers	economizer	yes X	no	
O_2 level in exhaust gas in		[%]				
Rate of condensate return	95	[%]	at [temperature of condensate return]		[°C]	
Rate of direct used steam		[%]				
Leakage detection steam traps	yes	no	frequency		[times/year]	

General information

Country	ITALY
Company number	9
Sector	PAPER MILL

Information Steam System

Installed Capacity	NOT AVAILABLE	[MWth]		
System	Open		Closed	X

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	90%	[%]
Steam production efficiency	NOT AVAILABLE	[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency	1,3	[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	GAS	[gas, oil, biomass]
Nominal steam capacity	7,5	[tons/hour]
Size of boiler		[MWth]
Boiler Pressure level	10	[barg] (pressure referred to atmosphere (1 bar absolute)
Boiler operation	8250	[hours/year]
Kind of control		[CO/O_2]
Exhaust Gas Temperature		[°C] after economizers economizer yes no
O_2 level in exhaust gas in		[%]
Rate of condensate return	95	[%] at [temperature of condensate return] [°C]
Rate of direct used steam		[%]
Leakage detection steam traps	yes	no frequency [times/year]

General information

Country	ITALY
Company number	10
Sector	PAPER MILL

Information Steam System

Installed Capacity	NOT AVAILABLE	[MWth]		
System	Open		Closed	X

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	92%	[%]
Steam production efficiency	NOT AVAILABLE	[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency	1,38	[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	GAS	[gas, oil, biomass]
Nominal steam capacity	26	[tons/hour]
Size of boiler		[MWth]
Boiler Pressure level	10	[barg] (pressure referred to atmosphere (1 bar absolute)
Boiler operation	8400	[hours/year]
Kind of control		[CO/O_2]
Exhaust Gas Temperature	130	[°C] after economizers
O_2 level in exhaust gas in		[%]
Rate of condensate return	95	[%]
Rate of direct used steam		[%]
Leakage detection steam traps		

economizer yes X no

at [temperature of condensate return] [°C]

Leakage detection steam traps yes no frequency [times/year]

General information

Country	Czech Republic
Company number	1
Sector	Pulp and paper

Information Steam System

Installed Capacity		393	[MWth]	
System	Open		Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	87	[%]	
Steam production efficiency	0.12	[GJ/GJ]	
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water]	145 [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]	
Overall steam use efficiency	22.261	GJ/Tons of product	
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]	

Additional Bench Mark Data (collect when available)

Kind of fuel	biomass	[gas, oil, biomass]				
Nominal steam capacity		[tons/hour]				
Size of boilers	393.5	[MWth]				
Boiler Pressure level	85	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	8000	[hours/year]				
Kind of control	all	[CO/O_2]				
Exhaust Gas Temperature	140	[°C] after economizers	economizer	yes X	no	
O_2 level in exhaust gas in	4	[%]				
Rate of condensate return	74	[%]	at [temperature of condensate return]	90 [°C]		
Rate of direct used steam	-	[%]				
Leakage detection steam traps	yes X	no	frequency	2 [times/year]		

General information

Country	Czech Republic
Company number	2
Sector	Chemical industry

Information Steam System

Installed Capacity	47,91	[MWth]		
System	Open		Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	67	[%]
Steam production efficiency	1,49	[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency		GJ/Tons of product
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	lignite	[gas, oil, biomass]					
Nominal steam capacity	13,5	[tons/hour]					
Size of boilers	15,97	[MWth]					
Boiler Pressure level	20	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	8000	[hours/year]					
Kind of control	all	[CO/O_2]					
Exhaust Gas Temperature	220	[°C] after economizers	economizer	yes	X	no	
O_2 level in exhaust gas in	15,7	[%]					
Rate of condensate return	60	[%]	at [temperature of condensate return]		90	[°C]	
Rate of direct used steam	30	[%]					
Leakage detection steam traps	yes	no x	frequency			[times/year]	

General information

Country	Czech Republic
Company number	3
Sector	Chemical industry

Information Steam System

Installed Capacity	332	[MWth]		
System	Open	x	Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	87	[%]
Steam production efficiency	1,3	[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency		GJ/Tons of product
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	coal	[gas, oil, biomass]					
Nominal steam capacity	405	[tons/hour]					
Size of boilers	332	[MWth]					
Boiler Pressure level	92	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	4500	[hours/year]					
Kind of control	all	[CO/O_2]					
Exhaust Gas Temperature	140 - 170	[°C] after economizers	economizer	yes	X	no	
O_2 level in exhaust gas in	2 - 10	[%]					
Rate of condensate return	40	[%]	at [temperature of condensate return]		50	[°C]	
Rate of direct used steam	35	[%]					
Leakage detection steam traps	yes X	no	frequency		4	[times/year]	

General information

Country	Czech Republic
Company number	4
Sector	Food industry

Information Steam System

Installed Capacity	22	[MWth]		
System	Open	x	Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	85	[%]
Steam production efficiency	1,4	[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency	0	GJ/Tons of product
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]					
Nominal steam capacity	28	[tons/hour]					
Size of boilers	22	[MWth]					
Boiler Pressure level	7	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	8760	[hours/year]					
Kind of control	all	[CO/O_2]					
Exhaust Gas Temperature	130 - 150	[°C] after economizers	economizer	yes	X	no	
O_2 level in exhaust gas in	8 - 10	[%]					
Rate of condensate return	50	[%]	at [temperature of condensate return]		70	[°C]	
Rate of direct used steam	35	[%]					
Leakage detection steam traps	yes		no x	frequency		[times/year]	

General information

Country	Czech Republic
Company number	5
Sector	Dairy industry

Information Steam System

Installed Capacity	16	[MWth]		
System	Open	x	Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	90	[%]
Steam production efficiency	1,1	[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency	0	GJ/Tons of product
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]					
Nominal steam capacity	24	[tons/hour]					
Size of boilers	16	[MWth]					
Boiler Pressure level	15	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	4800	[hours/year]					
Kind of control	all	[CO/O_2]					
Exhaust Gas Temperature	150 - 180	[°C] after economizers	economizer	yes	X	no	
O_2 level in exhaust gas in	4-8	[%]					
Rate of condensate return	80	[%]	at [temperature of condensate return]		50	[°C]	
Rate of direct used steam	15	[%]					
Leakage detection steam traps	yes	no x	frequency			[times/year]	

General information

Country	Czech Republic
Company number	6
Sector	Machinery

Information Steam System

Installed Capacity		31	[MWth]		
System	Open		Closed	x	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	88	[%]
Steam production efficiency	1,2	[GJ/GJ]
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency		GJ/Tons of product
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]					
Nominal steam capacity	45	[tons/hour]					
Size of boilers	31	[MWth]					
Boiler Pressure level	8	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	8300	[hours/year]					
Kind of control	all	[CO/O_2]					
Exhaust Gas Temperature	150 - 180	[°C] after economizers	economizer	yes	X	no	
O_2 level in exhaust gas in	8-10	[%]					
Rate of condensate return	90	[%]	at [temperature of condensate return]		85	[°C]	
Rate of direct used steam	0	[%]					
Leakage detection steam traps	yes x	no	frequency		1	[times/year]	

General information

Country	Greece
Company number	
Sector	food processing-cold cuts

Information Steam System

Installed Capacity			[MWth]	
System	Open		Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	91	[%]
Steam production efficiency	-	[GJ/GJ]
- Alternativ when above not available	-	[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available	-	[m³ gas/kg fresh water for steam]
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel		Mazut	[gas, oil, biomass]				
Nominal steam capacity		11	[tons/hour]				
Size of boiler		-	[MWth]				
Boiler Pressure level		7	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation		5000	[hours/year]				
Kind of control		YES	[CO/O_2]				
Exhaust Gas Temperature		175	[°C] after economizers	economizer	yes		no
O_2 level in exhaust gas in		-	[%]				
Rate of condensate return			[%]	at [temperature of condensate return]		98	[°C]
Rate of direct used steam		50	[%]				
Leakage detection steam traps	yes	YES	no		frequency	2	[times/year]

General information

Country	Greece
Company number	
Sector	food processing - cheese products

Information Steam System

Installed Capacity			[MWth]	
System	Open		Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	93& 92	[%]		
Steam production efficiency	-	[GJ/GJ]		
- Alternativ when above not available	-	[m³ gas/m3 feed in water] at [temperature of feed in water]		[°C]
- Alternativ when above not available	-	[m³ gas/kg fresh water for steam]		
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]		
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]		

Additional Bench Mark Data (collect when available)

Kind of fuel	LPG	[gas, oil, biomass]				
Nominal steam capacity	3&2	[tons/hour]				
Size of boiler	3,023&1,512	[MWth]				
Boiler Pressure level	7	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	8760	[hours/year]				
Kind of control	O2	[CO/O_2]				
Exhaust Gas Temperature	182 & 176	[°C] after economizers	economizer	yes		no
O_2 level in exhaust gas in	5,7 &4,5	[%]				
Rate of condensate return	-	[%]	at [temperature of condensate return]			[°C]
Rate of direct used steam	-	[%]				
Leakage detection steam traps	yes YES	no	frequency	1	[times/year]	

General information

Country	Greece
Company number	
Sector	food processing - dairy products

Information Steam System

Installed Capacity			[MWth]	
System	Open		Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	90	[%]		
Steam production efficiency	-	[GJ/GJ]		
- Alternativ when above not available	-	[m³ gas/m3 feed in water] at [temperature of feed in water]		[°C]
- Alternativ when above not available	-	[m³ gas/kg fresh water for steam]		
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]		
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]		

Additional Bench Mark Data (collect when available)

Kind of fuel	LPG, electricity	[gas, oil, biomass]				
Nominal steam capacity	1,6	[tons/hour]				
Size of boiler	1	[MWth]				
Boiler Pressure level	8-sep	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	2000	[hours/year]				
Kind of control	O2/co2	[CO/O_2]				
Exhaust Gas Temperature	240	[°C] after economizers	economizer	yes		no
O_2 level in exhaust gas in	6	[%]				
Rate of condensate return	-	[%]	at [temperature of condensate return]			[°C]
Rate of direct used steam	-	[%]				
Leakage detection steam traps	yes YES	no	frequency		1	[times/year]

General information

Country	NL
Company number	1
Sector	Plastics processing

Information Steam System

Installed Capacity		na	[MWth]		
System	Open	5	Closed	95	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	na	[%]	
Steam production efficiency	na	[GJ/GJ]	
- Alternativ when above not available	na	[m³ gas/m3 feed in water] at [temperature of feed in water]	[°C]
- Alternativ when above not available	na	[m³ gas/kg fresh water for steam]	
Overall steam use efficiency	na	[kg steam/ per product (piece, kg, m2)]	
- Alternativ when above not available	na	[m³ gas for steam boiler / per product(piece, kg, m^2)]	

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]				
Nominal steam capacity	na	[tons/hour]				
Size of boiler	na	[MWth]				
Boiler Pressure level	8-12	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	na	[hours/year]				
Kind of control	na	[CO/O_2]				
Exhaust Gas Temperature	na	[°C] after economizers	economizer	yes		no x
O_2 level in exhaust gas in	na	[%]				
Rate of condensate return	95	[%]	at [temperature of condensate return]		168	[°C]
Rate of direct used steam	5	[%]				
Leakage detection steam traps	yes	no x	frequency			[times/year]

General information

Country	NL
Company number	2
Sector	Paper processing

Information Steam System

Installed Capacity	na	[MWth]		
System	Open	14	Closed	86

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	90,6	[%]	
Steam production efficiency		(GJ gas en elektra/ GJ water)	
- Alternativ when above not available	683,0565	[m³ gas/m3 feed in water] at [temperature of feed in water]	15 [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]	
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]	
- Alternativ when above not available	431	m3/ton	

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]				
Nominal steam capacity	na	[tons/hour]				
Size of boiler	na	[MWth]				
Boiler Pressure level	10	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	na	[hours/year]				
Kind of control	na	[CO/O_2]				
Exhaust Gas Temperature	na	[°C] after economizers	economizer	yes		no x
O_2 level in exhaust gas in	na	[%]				
Rate of condensate return	86	[%]	at [temperature of condensate return]		85	[°C]
Rate of direct used steam	14	[%]				
Leakage detection steam traps	yes	no x	frequency			[times/year]

General information

Country	NL
Company number	3
Sector	Plastic processing

Information Steam System

Installed Capacity	8,4	[MWth]		
System	Open		Closed	100%

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	90	[%]		
Steam production efficiency	na	[GJ/GJ]		
- Alternativ when above not available	na	[m³ gas/m3 feed in water] at [temperature of feed in water]		[°C]
- Alternativ when above not available	na	[m³ gas/kg fresh water for steam]		
Overall steam use efficiency	na	[kg steam/ per product (piece, kg, m2)]		
- Alternativ when above not available	94	m3/ton		

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]				
Nominal steam capacity	na	[tons/hour]				
Size of boiler	2x4,2	[MWth]				
Boiler Pressure level	6-22	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	continu	[hours/year]				
Kind of control	na	[CO/O_2]				
Exhaust Gas Temperature	na	[°C] after economizers	economizer	yes		no x
O_2 level in exhaust gas in	na	[%]				
Rate of condensate return	100	[%]	at [temperature of condensate return]			[°C]
Rate of direct used steam	0	[%]				
Leakage detection steam traps	yes x	no	frequency is spoken of		0-1	[times/year]

General information

Country	NL
Company number	4
Sector	Meat processing

Information Steam System

Installed Capacity		5,6	[MWth]		
System	Open	100%	Closed	0%	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	78	[%]
Steam production efficiency		[GJ/GJ]
- Alternativ when above not available	na	[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available	na	[m³ gas/kg fresh water for steam]
Overall steam use efficiency	na	[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available	na	[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]					
Nominal steam capacity	na	[tons/hour]					
Size of boiler	2x2,8	[MWth]					
Boiler Pressure level	10	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	continu	[hours/year]	in rest 5 bar				
Kind of control	na	[CO/O_2]					
Exhaust Gas Temperature	na	[°C] after economizers	economizer	yes		no	x
O_2 level in exhaust gas in	na	[%]					
Rate of condensate return	0	[%]	at [temperature of condensate return]			[°C]	
Rate of direct used steam	100	[%]					
Leakage detection steam traps	yes		no x	frequency		[times/year]	

General information

Country	NL
Company number	5
Sector	Plastics processing

Information Steam System

Installed Capacity	7,4	[MWth]		
System	Open	82	Closed	18

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	88,1	[%]
Steam production efficiency		[GJ/GJ]
- Alternativ when above not available	73	[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available	141	m3gas/ton

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]
Nominal steam capacity	2x5	[tons/hour]
Size of boiler	2x3,7	[MWth] Eén is in gebruik (ander droog)
Boiler Pressure level	6,5	[barg] (pressure referred to atmosphere (1 bar absolute)
Boiler operation	na	[hours/year]
Kind of control	na	[CO/O_2]
Exhaust Gas Temperature	na	[°C] after economizers
O_2 level in exhaust gas in	na	[%]
Rate of condensate return	18	[%] at [temperature of condensate return] [°C]
Rate of direct used steam	82	[%]
Leakage detection steam traps	yes	no x frequency [times/year]

Rookgascondensor: YES

economizer yes no x

General information

Country	NL
Company number	6
Sector	Plastics processing

Information Steam System

Installed Capacity		4,3	[MWth]		
System	Open	80	Closed	20	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	75	[%]			
Steam production efficiency	0,62	[GJ/GJ]			
- Alternativ when above not available	67-76	[m³ gas/m3 feed in water] at [temperature of feed in water]	?	[°C]	
- Alternativ when above not available		[m³ gas/kg fresh water for steam]			
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]			
- Alternativ when above not available	126	m3gas/ton			

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]				
Nominal steam capacity	na	[tons/hour]				
Size of boiler	4,3	[MWth]				
Boiler Pressure level	7	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	2000	[hours/year]				
Kind of control	na	[CO/O_2]				
Exhaust Gas Temperature	na	[°C] after economizers	economizer	yes	x	no x
O_2 level in exhaust gas in	na	[%]				
Rate of condensate return	20	[%]	at [temperature of condensate return]			[°C]
Rate of direct used steam	80	[%]				
Leakage detection steam traps	yes x	no	frequency	1	[times/year]	

General information

Country	NL
Company number	7
Sector	Meat processing

Information Steam System

Installed Capacity		0,45	[MWth]		
System	Open	100	Closed		

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	83	[%]
Steam production efficiency	na	[GJ/GJ]
- Alternativ when above not available	na	[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available	na	[m³ gas/kg fresh water for steam]
Overall steam use efficiency	na	[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available	na	[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]					
Nominal steam capacity	na	[tons/hour]					
Size of boiler	na	[MWth]					
Boiler Pressure level	na	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	na	[hours/year]					
Kind of control	na	[CO/O_2]					
Exhaust Gas Temperature	na	[°C] after economizers	economizer	yes		no	x
O_2 level in exhaust gas in	na	[%]					
Rate of condensate return	0	[%]	at [temperature of condensate return]		[°C]		
Rate of direct used steam	100	[%]					
Leakage detection steam traps	yes	no x	frequency		[times/year]		

General information

Country	NL
Company number	8
Sector	Meat processing

Information Steam System

Installed Capacity		4,9	[MWth]		
System	Open	50	Closed	50	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	80	[%]	
Steam production efficiency	na	[GJ/GJ]	
- Alternativ when above not available	na	[m³ gas/m3 feed in water] at [temperature of feed in water]	na [°C]
- Alternativ when above not available	na	[m³ gas/kg fresh water for steam]	
Overall steam use efficiency	na	[kg steam/ per product (piece, kg, m2)]	
- Alternativ when above not available	na	[m³ gas for steam boiler / per product(piece, kg, m^2)]	

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]					
Nominal steam capacity	na	[tons/hour]					
Size of boiler	2,3+2,6	[MWth]					
Boiler Pressure level	7	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	na	[hours/year]					
Kind of control	na	[CO/O_2]			On just 1 of the boilers		
Exhaust Gas Temperature	na	[°C] after economizers	economizer	yes x	no x		
O_2 level in exhaust gas in	na	[%]					
Rate of condensate return	50	[%]	at [temperature of condensate return]	na [°C]			
Rate of direct used steam	50	[%]					
Leakage detection steam traps	yes	no x	frequency	[times/year]			

General information

Country	NL
Company number	9
Sector	Paper processing

Information Steam System

Installed Capacity		2,6	[MWth]	
System	Open	2		98

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	85	[%]		
Steam production efficiency		[GJ/GJ]		
- Alternativ when above not available	393	[m³ gas/m3 feed in water] at [temperature of feed in water]	12	[°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]		
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]		
- Alternativ when above not available	0,27	m3/kg paper (over 1 year)		

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]				
Nominal steam capacity	4	[tons/hour]				
Size of boiler	2,6	[MWth]				
Boiler Pressure level	9	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	5880	[hours/year]				
Kind of control	na	[CO/O_2]				
Exhaust Gas Temperature	na	[°C] after economizers	economizer	yes		no x
O_2 level in exhaust gas in	3-6	[%]				
Rate of condensate return	98	[%]	at [temperature of condensate return]			[°C]
Rate of direct used steam	2	[%]				
Leakage detection steam traps	yes	no x	frequency			[times/year]

General information

Country	NL
Company number	10
Sector	Meat processing

Information Steam System

Installed Capacity			[MWth]		
System	Open	100	Closed		

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	80	[%]
Steam production efficiency	na	[GJ/GJ]
- Alternativ when above not available	na	[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available	na	[m³ gas/kg fresh water for steam]
Overall steam use efficiency	na	[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available	na	[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]					
Nominal steam capacity	na	[tons/hour]					
Size of boiler	na	[MWth]					
Boiler Pressure level	na	[barg] (pressure referred to atmosphere (1 bar absolute)					
Boiler operation	na	[hours/year]					
Kind of control	na	[CO/O_2]					
Exhaust Gas Temperature	na	[°C] after economizers	economizer	yes		no	x
O_2 level in exhaust gas in	na	[%]					
Rate of condensate return	na	[%]	at [temperature of condensate return]		na	[°C]	
Rate of direct used steam	na	[%]					
Leakage detection steam traps	yes		no x	frequency	na	[times/year]	

General information

Country	NL
Company number	11
Sector	Paper processing

Information Steam System

Installed Capacity		8,4	[MWth]		
System	Open	2%	Closed	98%	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	88	[%]		
Steam production efficiency	0,79	[GJ/GJ]		
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water]	12	[°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]		
Overall steam use efficiency	NA	[kg steam/ per product (piece, kg, m2)]		
- Alternativ when above not available	NA	[m³ gas for steam boiler / per product(piece, kg, m^2)]		

Additional Bench Mark Data (collect when available)

Kind of fuel	gas	[gas, oil, biomass]				
Nominal steam capacity	NA	[tons/hour]				
Size of boiler	8,4	[MWth]				
Boiler Pressure level	11	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	NA	[hours/year]				
Kind of control		[CO/O_2]				
Exhaust Gas Temperature	NA	[°C] after economizers	economizer	yes		no x
O_2 level in exhaust gas in		[%]				
Rate of condensate return	98	[%]	at [temperature of condensate return]			[°C]
Rate of direct used steam	2	[%]				
Leakage detection steam traps	yes	no x	frequency			[times/year]

General information

Country	NL
Company number	12
Sector	Fruit processing (softdrinks)

Information Steam System

Installed Capacity		11,6	[MWth]	
System	Open		Closed	100%

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	85	[%]
Steam production efficiency		[GJ/GJ]
- Alternativ when above not available	197	[m³ gas/m3 feed in water] at [temperature of feed in water] NA [°C]
- Alternativ when above not available		
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available	12,62	m3 gas/ ton production

Additional Bench Mark Data (collect when available)

Kind of fuel	Gas	[gas, oil, biomass]
Nominal steam capacity	2x 8,5	[tons/hour]
Size of boiler	2x 5,82	[MWth]
Boiler Pressure level	8	[barg] (pressure referred to atmosphere (1 bar absolute)
Boiler operation	6000	[hours/year]
Kind of control		[CO/O_2]
Exhaust Gas Temperature	130	[°C] after economizers — economizer yes x no
O_2 level in exhaust gas in		[%]
Rate of condensate return	100	[%] at [temperature of condensate return] 80 [°C]
Rate of direct used steam		[%]
Leakage detection steam traps	yes	no x — frequency [times/year]

General information

Country	Denmark
Company number	1
Sector	Pharmacuetical

Information Steam System

Installed Capacity			[MWth]	
System	Open		Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	> 90	[%]
Steam production efficiency	1)	[GJ/GJ]
- Alternativ when above not available	2)	[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[m³ gas/kg fresh water for steam]
Overall steam use efficiency	NA	[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]

Additional Bench Mark Data (collect when available)

Kind of fuel	Nat. gas	[gas, oil, biomass]
Nominal steam capacity	48	[tons/hour] (2*12.5) + 10 + 13 (gasturbine)
Size of boiler		[MWth]
Boiler Pressure level	8	[barg] (pressure referred to atmosphere (1 bar absolute)
Boiler operation	5-6000	[hours/year]
Kind of control	O_2	[CO/O_2]
Exhaust Gas Temperature	90-105	[°C] after economizers
O_2 level in exhaust gas in		[%]
Rate of condensate return	60	[%] at [temperature of condensate return] [°C]
Rate of direct used steam	40	[%]
Leakage detection steam traps	yes x	no

economizer yes x no

frequency 12 [times/year]

+ 2 ann. overhaul

1) Online measurement of steam production, 2) Gas meter and feed water temperature available.

General information

Country	Denmark
Company number	2
Sector	Laundry

Information Steam System

Installed Capacity			[MWth]	
System	Open		Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	89	[%]		
Steam production efficiency	90	[%]		
- Alternativ when above not available	100	[m³ gas/m3 feed in water] at [temperature of feed in water]	130	[°C]
- Alternativ when above not available	14,5	[kg steam/m³ gas]		
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]		
- Alternativ when above not available		[m³ gas for steam boiler / per product(piece, kg, m^2)]		

Additional Bench Mark Data (collect when available)

Kind of fuel	biomass	[gas, oil, biomass]	(8600 Kcal/kg)			
Nominal steam capacity	4	[tons/hour][1]				
Size of boiler	2.736	[kWh]				
Boiler Pressure level	11-12	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	8760	[hours/year]				
Kind of control		[CO/O_2]				
Exhaust Gas Temperature	72,8	[°C] after economizers	economizer	yes	x	no
O_2 level in exhaust gas in	4,2	[%]				
Rate of condensate return	80	[%]	at [temperature of condensate return]	95	[°C]	
Rate of direct used steam		[%]				
Leakage detection steam traps	yes x	no	frequency	2	[times/year]	

[1] LP: 8+15 ton/hour, HP: 11=10 tons/hour (11 comes from CHP)

General information

Country	Denmark
Company number	4
Sector	Laundry

Information Steam System

Installed Capacity			[MWth]	
System	Open		Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	NA	[%]		
Steam production efficiency	2,5	[GJ/ton]		
- Alternativ when above not available		[m³ gas/m3 feed in water] at [temperature of feed in water]		[°C]
- Alternativ when above not available		[kg steam/m³ gas]		
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]		
- Alternativ when above not available	93	[m³ gas for steam boiler / per tons of paper)]		

Additional Bench Mark Data (collect when available)

Kind of fuel	nat. gas	[gas, oil, biomass]	(8600 Kcal/kg)			
Nominal steam capacity	16 + 18	[tons/hour]				
Size of boiler		[kWh]				
Boiler Pressure level	15+12	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	8300	[hours/year]				
Kind of control		[CO/O_2]				
Exhaust Gas Temperature	48	[°C] after economizers	economizer	yes	x	no
O_2 level in exhaust gas in	3	[%]				
Rate of condensate return	90-95	[%]	at [temperature of condensate return]			[°C]
Rate of direct used steam		[%]				
Leakage detection steam traps	yes	no	frequency			[times/year]

General information

Country	Denmark
Company number	7
Sector	Foods

Information Steam System

Installed Capacity	1,04	[MWth]		
System	Open		Closed	

Primary Bench Mark Data (prioritized by Steam Up partners)

Efficiency of steam boiler	NA	[%]
Steam production efficiency		[GJ/ton]
- Alternativ when above not available	15	[m³ gas/m3 feed in water] at [temperature of feed in water] [°C]
- Alternativ when above not available		[kg steam/m³ gas]
Overall steam use efficiency		[kg steam/ per product (piece, kg, m2)]
- Alternativ when above not available		[m³ gas for steam boiler / per tons of paper)]

Additional Bench Mark Data (collect when available)

Kind of fuel	nat. gas	[gas, oil, biomass]	(8600 Kcal/kg)			
Nominal steam capacity	1,6	[tons/hour]				
Size of boiler		[kWh]				
Boiler Pressure level	7	[barg] (pressure referred to atmosphere (1 bar absolute)				
Boiler operation	8760	[hours/year]				
Kind of control		[CO/O_2]				
Exhaust Gas Temperature	124	[°C] after economizers	economizer	yes		no x
O_2 level in exhaust gas in	4,1	[%]				
Rate of condensate return	40	[%]	at [temperature of condensate return]		90	[°C]
Rate of direct used steam		[%]				
Leakage detection steam traps	yes x	no	frequency		2	[times/year]