



**Combined heat and power (CHP)
&
Industrial burner gas production
at the manufacturing site**

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Agenda

- Why gasification?
- Meva Energy's solution
- 2 case examples
 - Tissue drying
 - Engineered wood production
- Biochar as valueable by-product



Industrial process heat constitutes 24% of total world energy consumption



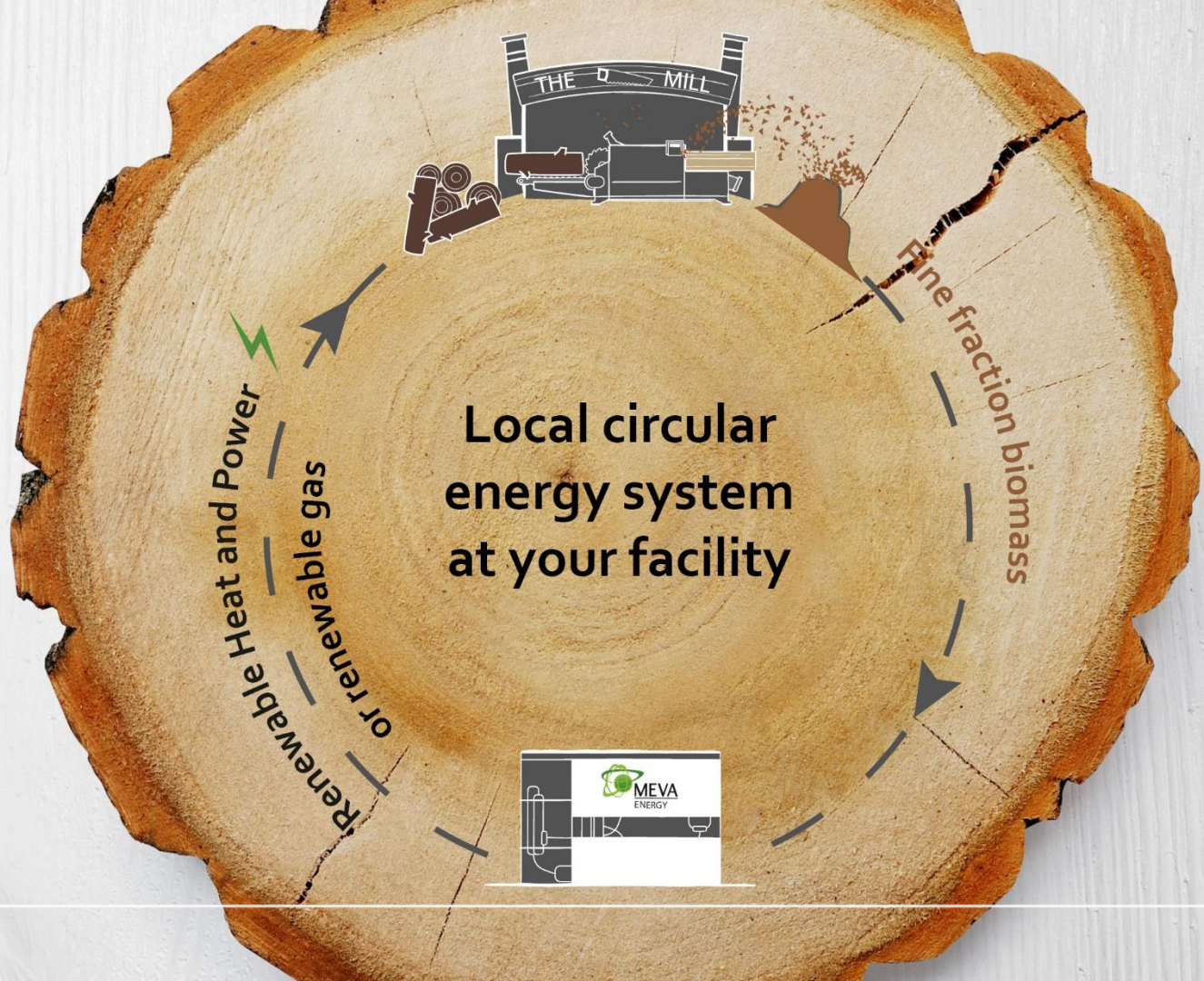


Bioenergy needs new solutions

Contaminated
biomass such
as MDF-dust

Emission
challenges:
Particulate, NOx

Fine fraction
biomass



Local circular
energy system
at your facility



Meva Energy existing gasification plant in Piteå, Sweden

Industrial scale CHP plant installed in Piteå, Sweden

Capacity:
1,2MWe and 2,4MWt



The existing Hortlax plant, Piteå Sweden

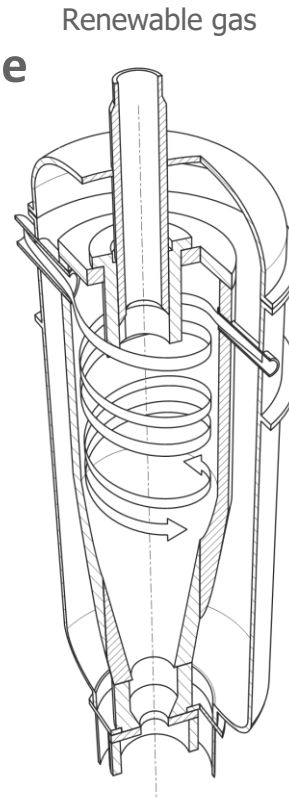


Entrained flow cyclone gasification principle



Biomass fines
introduced in air stream

Saw dust, MDF, bark,
straw, rice husks etc.



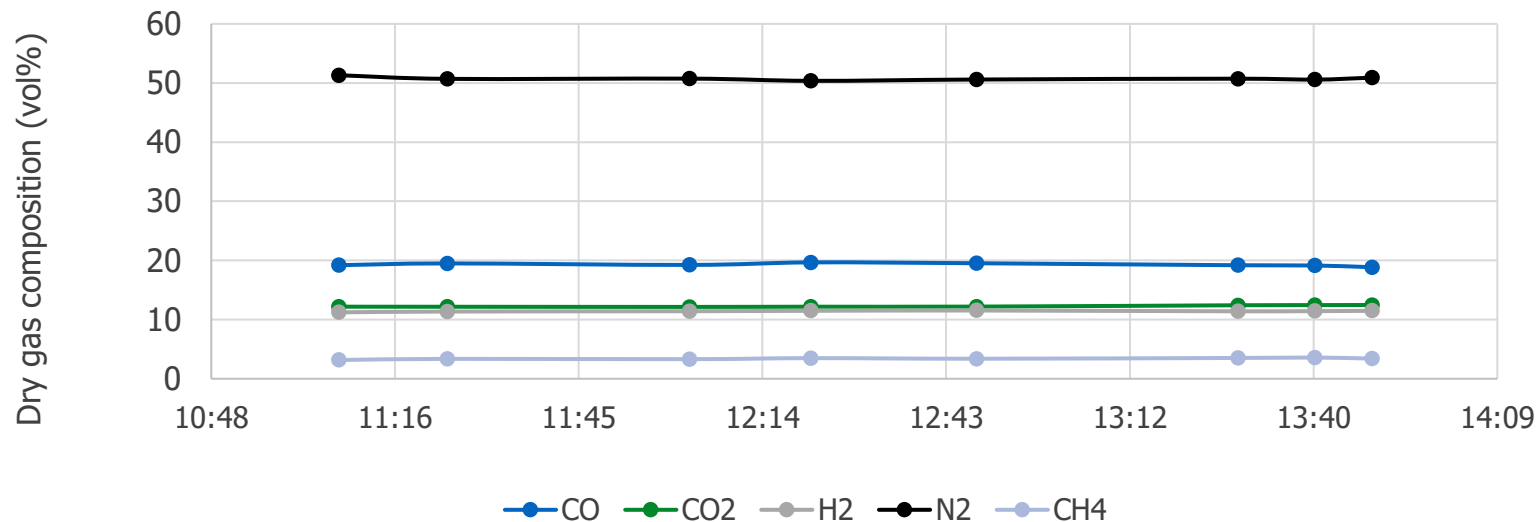
Biomass fines
introduced in air stream

Saw dust, MDF, bark,
straw, rice husks etc.

Biochar side stream




Stable gas flow, temperature and functionality



Calorific value 6,5MJ/Nm3



More efficient and less costly than conventional biopower solution

	 MEVA ENERGY	Conventional Biomass Steam Turbine (comparable size)
Capacity	2.6 MW	<10 MW
Power generation efficiency	30%	14-18%
Capital costs/MWe (%)	53-87%	100%
Operating costs (% of capital costs)	4%	5.5-6.5%
Harmful NOx and particulate emissions	0-15%	100%
By-product	Biochar (carbon sink)	Ashes
Additional environmental permits for waste combustion	NO	YES



^[1] Source for reference scenario units: IEA analysis based on DECC (011, IPCC (2011), Mott MacDonald (2011), Uslu et.al. (2012)

Gas for industrial burners



Combustion and tissue drying verified by RISE and together with commercial burner manufacturers at Hortlax



ANDRITZ  **enviroburners** **RISE**



Market segment: Tissue industry

Issue:

Tissue drying is dependent on fossil gas to generate high quality process heat, conflicting demand for CO2 reduction

Solution:

Meva Energy renewable gas from local biomass replacing fossil gas

Market potential:

Beachhead: Swedish Tissue industry

>700 tissue mills

Ceramics, building industry, metals, food, glass, textiles etc.



Board-based furniture





Market segment: Engineered wood industry

Issue:

Waste issue of fine fraction contaminated wood dust (MDF/particle boards/HDF etc.) and urge to transform to renewable energy.

Solution:

Meva Energy combined heat and power plant using wood residue to generate cost-efficient renewable energy at site

Market potential:

Beachhead: 80 Furniture related plants
147 MDF plants and 209 Particle boards in Europe

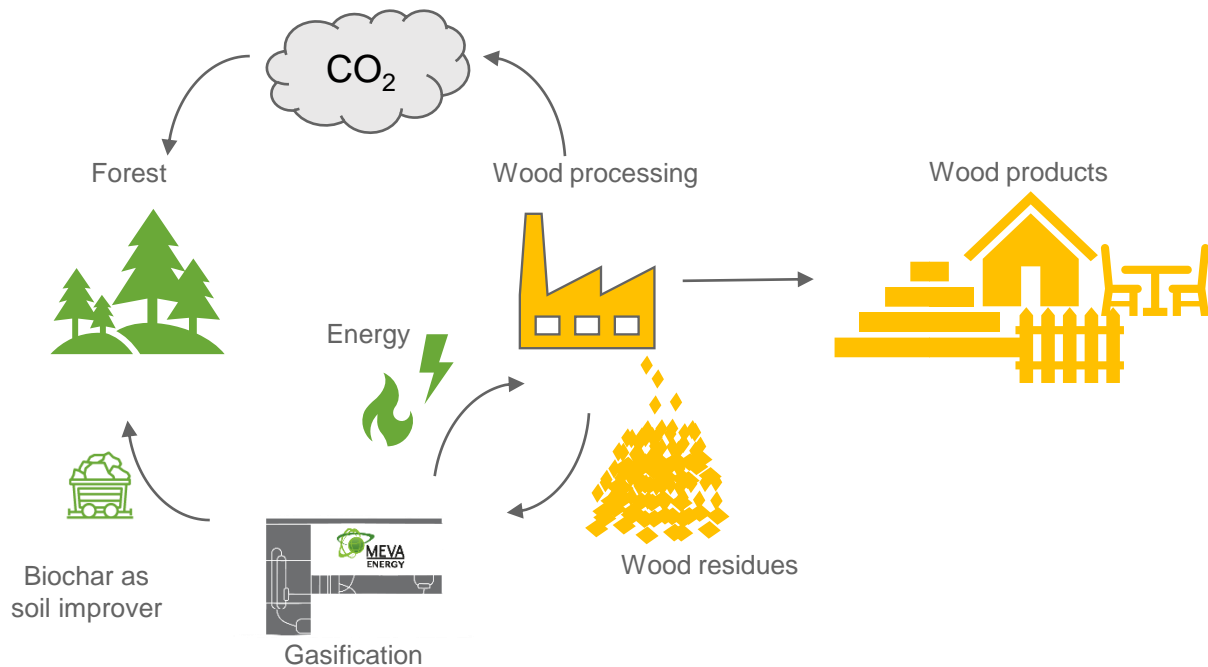


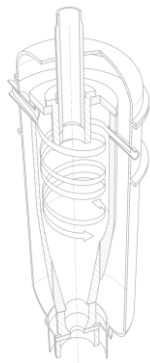
By-stream of valuable biochar



Circularity with biochar as soil improver

- Better yield**
 - More CO₂ reduction
 - More products
- Store carbon**
 - More CO₂ reduction





Entrained flow
cyclone gasification
principle

Heat & Power (CHP)
Decentralized combined
heat and power

TECHNOLOGY



With the utilization of low
cost, small fraction dry
biomass
(woodfiber, sawdust, rice husk etc.)

Gas fuel
Replacing fossil natural gas
and LPG in industrial burners

APPLICATIONS



2 application examples

CHP
Board based furniture manufacturing

Projects will be announced soon

Gas
Tissue industry





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