

### *Sustainable energy growth*

The growth of renewable energy resources is a corner stone to meet the increasing global demand for energy in a sustainable manner. Gasification of biomass has been appointed by both the United Nations (UN) and the International Energy Agency (IEA) as a critical technology to fulfill this demand.

### *Proven but unique*

Cortus Energy has developed the WoodRoll® process, a breakthrough technology for gasification of biomass. WoodRoll® is based upon industrially proven part-processes that are combined into a unique and patented gasification process.

### *Renewable and cost effective*

Woodroll® produces a renewable energy gas in a cost effective process. WoodRoll®'s innovations include:

- *A fully integrated process:* from receiving the none pretreated biomass to the delivery of a clean energy gas.
- *Widest fuel flexibility:* enabling use of local low-grade feedstock e.g. wood chips, bark, forest residues industrial and agricultural waste and byproducts.
- *Highest efficiency:* heat is generated internally and recovered within the process, typically 80% of the energy from the biomass is converted into the energy gas.
- *A clean energy gas:* impurities are separated before gasification resulting in a unique tar-free energy gas ready for use and eliminating the need of expensive gas cleaning.
- *High energy density with a favorable gas composition:* Truly indirect heated gasifier using steam as oxidizing agent results in a non-diluted energy gas with a favorable chemical composition.

Typical applications for WoodRoll® are to replace fossil fuels in high temperature industrial processes, feedstock to the petrochemical industry, Combined Heat & Power (CHP), SNG (“Biomethane”) and renewable Hydrogen.

### *Interested? – Let’s Talk*

We are excited about discussing how WoodRoll® can assist with your energy needs and invite your inquiries for more information. Please email: [info@cortus.se](mailto:info@cortus.se)

### **Cortus Energy**

Founded in Sweden 2006, listed at the NASDAQ OMX First North in Stockholm, Sweden.

[www.cortusenergy.com](http://www.cortusenergy.com)

### **Business idea**

*Provide cost effective renewable energy gas for power, industrial and transport applications based upon the patented WoodRoll® process.*

### **Product status**

A 0,5 MW WoodRoll® test installation (Sweden) has been in operation since 2011. It produces an ultra-clean energy gas. Impurities are only detected on PPM level.

WoodRoll® is now ready to be commercialized. Initial capacity is fixed to 6 MW. The plant delivery is based on a modular concept securing quality, facilitating a fast installation resulting in a compact plant. Further scale up to 20 MW is in the pipeline.

The first 6 MW project is at Höganäs AB, Sweden. Renewable energy gas from WoodRoll® will replace natural gas in an iron powder process. Start of operation scheduled to 2018.



# WoodRoll® – Versatile green Energy gas

WoodRoll® is a unique technology that replaces fossil energy by efficient gasification of biomass that produces green energy for vehicles, industry and power generation.

## Feedstock

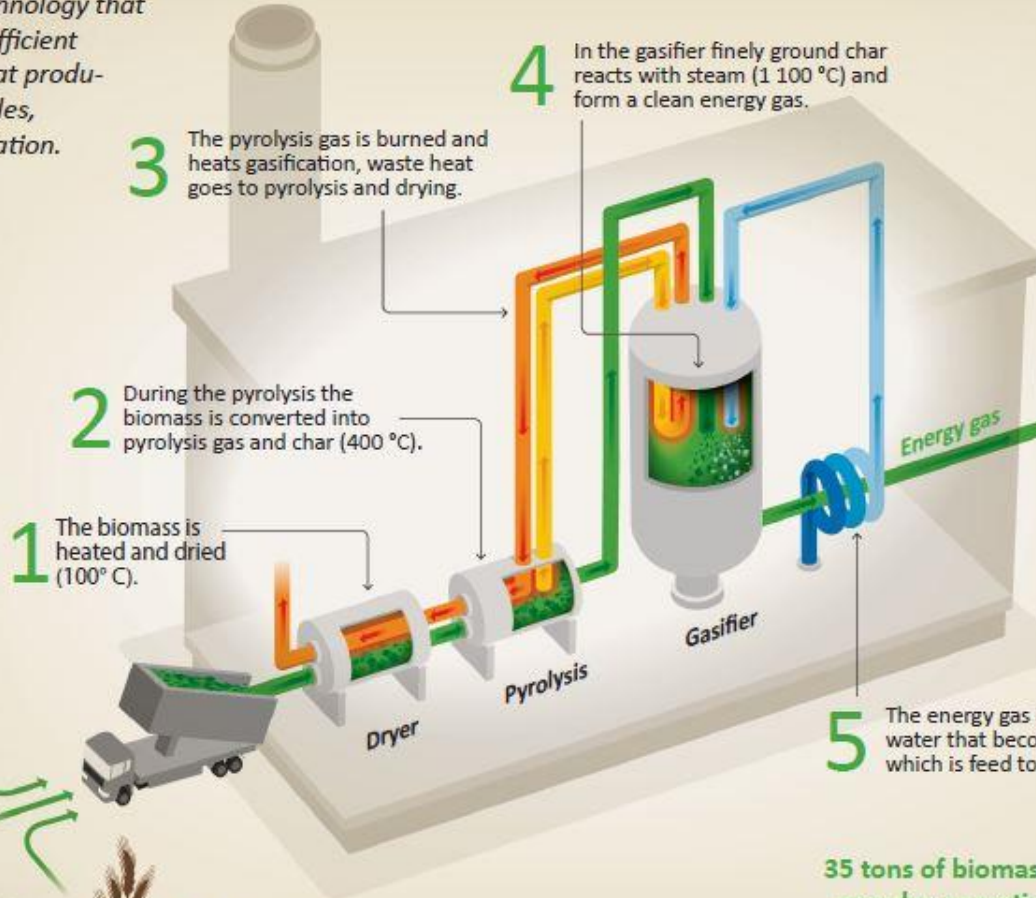
Forest-based feedstock such as forest residues and energy crops.



Waste from industry such as fiber sludge and construction waste.



Agricultural waste such as animal manure and crop residues.



1 The biomass is heated and dried (100° C).

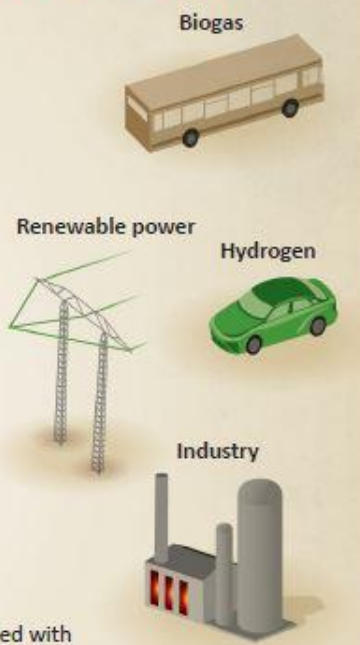
2 During the pyrolysis the biomass is converted into pyrolysis gas and char (400 °C).

3 The pyrolysis gas is burned and heats gasification, waste heat goes to pyrolysis and drying.

4 In the gasifier finely ground char reacts with steam (1 100 °C) and form a clean energy gas.

5 The energy gas is cooled with water that becomes steam, which is feed to the gasifier.

## Applications



35 tons of biomass (equivalent to a lorry with trailer)  
one-day operation of a WoodRoll® = 100 oil barrels

