

# Gasification

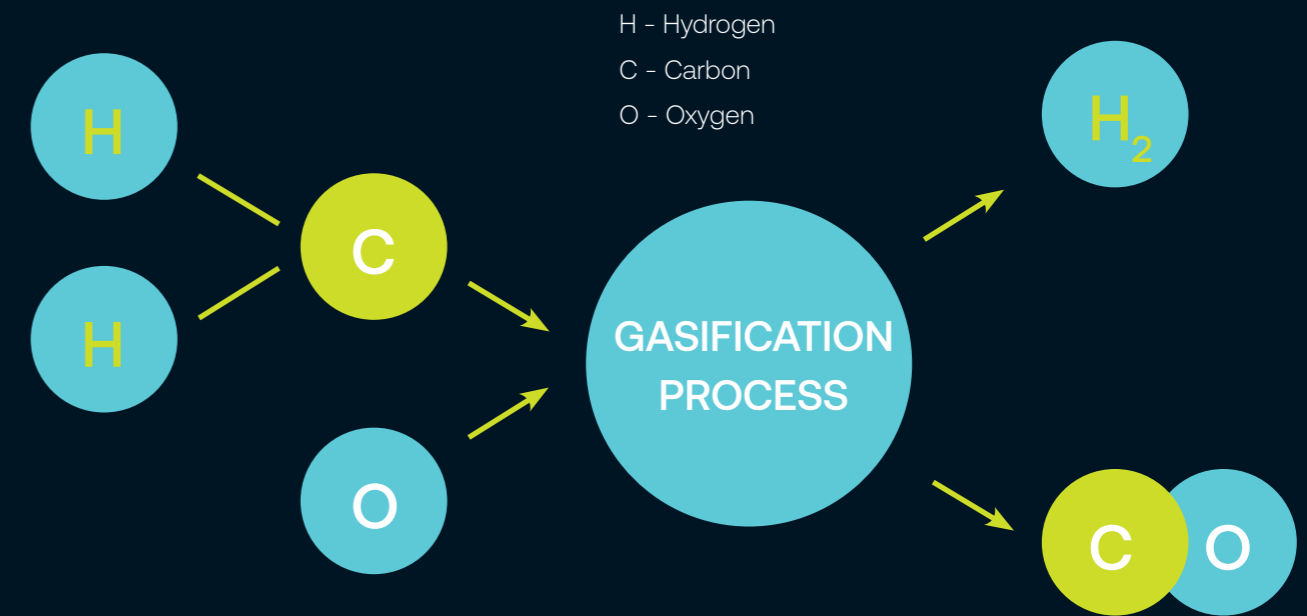


# Biomass and waste gasification

## A versatile and flexible solution for polygeneration

Gasification is a process that can find new value in biomass and waste feedstocks. Gasification can unlock the energy value of waste materials such as waste wood from construction, forest, lumber and paper industries, as well as a wide range of non-hazardous solid wastes including sorted plastics and recycled waste fuels (RDF/SRF) derived from municipal solid waste (MSW) and similar industrial and commercial waste (ICW). The oxygen-steam gasification process uses heat to break down the solids and liquids into their basic gaseous chemical components, mainly hydrogen and carbon monoxide, which are the raw materials for production of a wide range of chemicals, liquid biofuels, renewable gas, and hydrogen. We clean this syngas from the gasifier to fit the requirements of downstream product synthesis.

We are currently offering solutions up to 150 MWth. Our gasifiers are based on fuel-flexible fluidized bed technology. Fluidized bed technology utilizes vigorous mixing and long particle residence times to efficiently gasify the feedstock. The low-temperature in fluid bed gasification technology avoids melting of the ash, allowing the use of feedstocks that have a low ash melting temperature.



## Complete Customer Service

In addition to supplying the most advanced gasification technology, we also offer a full range of support services, such as:

- Overall flowsheet integration
- Energy optimization
- Selection of technologies
- Value engineering
- Reliability studies
- Cost estimates and economic analysis
- Control system philosophy



Featured project: NSE Biofuels  
**Production of carbon-neutral transportation fuels**



**Varkaus, Finland**

Start up year: **2009**

Capacity: **12 MWth**

Fuel: **Biomass, Forestry Residues**

Together with NSE Biofuels Oy Ltd., we have developed a CFB biomass gasification and syngas cleaning system which was part of NSE's new-generation renewable diesel demonstration project at Stora Enso's Varkaus Mill in Finland. This project demonstrated the conversion of biomass fuels into clean syngas that can be used to produce renewable transportation fuels.

**Key Features:**

- 12 MWth Plant to demonstrate gasification for conversion biomass into biodiesel
- SFW delivered the CFB biomass gasification and syngas cleaning systems on EPC basis
- Oxy-steam biomass gasification testing for 9000 hours
- Successfully demonstrated technical viability of producing liquid biofuels from biomass via gasification

Featured project: Corenso

**Recycling of aluminum foil-lined juice containers**

**Varkaus, Finland**

Start up year: **2000**

Capacity: **50 MWth**

Fuel: **Waste from Juice Carton Recycling Plant**

The gasification plant enables Corenso to convert the waste from the recycling plant into valuable steam needed to support their manufacturing process, while separating the aluminum for further recycling. This enables the reduction of dependence on fuel oil, helping Corenso to both save the environment and reduce operating cost.

**Key Features:**

- Innovative solutions for recycling juice containers into energy and an aluminum recycling stream
- Displaces fossil fuels, reducing both operating cost and the impact on the environment
- Reduces the company's carbon footprint
- Reduces wastes going to landfills

**Our Fluidized Bed Gasifier References**

Start-Up Date	Customer	Steam MWth	Primary Fuel	Application
2009	NSE Biofuels Finland	12	Biomass	Biomass to Renewable Diesel
2002	Electrabel Belgium	50	Biomass	Biomass co-firing in PC
2002	Corenso United Finland	50	Plastic Waste	Recycling and Energy Recovery of Waste
1997	Lahti Energia Finland	50	Recycled Fuels	Biomass Co-Firing in PC
1993	Sydskraft Sweden	18	Biomass	Biomass IGCC
1985	Portucel Portugal	15	Biomass	Lime Klin
1984	ASSI Karlsborg Sweden	27	Biomass	Lime Klin
1984	Norrstudent Bruks Sweden	25	Biomass	Lime Klin
1983	Oy W. Schauman Ab	35	Biomass	Lime Klin
1981	Hans Ahlstrom Laboratory Finland	3		Test Facility

**Complete expertise**

As a major player in gasification, we have the necessary in-house expertise located in our major engineering design centers around the world.



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## About us

Since 1891, Sumitomo SHI FW have developed and delivered the highest quality technology solutions within the everchanging energy market. Now the transition to a net zero world is reshaping industries and economies to improve our impact on our environment.

We work in partnership with our customers, cultivating a deep understanding of their businesses, to deliver integrated energy solutions.

We want to be a life-cycle partner, bringing complementary expertise and working closely with our customers across the entire process. This is from customer value creation to design, scope, installation, execution, maintenance, and operations.

We partner with a diverse array of experts to meet rapidly evolving customer needs. With our unique knowledge, proven expertise, leading

technology, and global reach, we go further, together. By working closely with our customers, we enhance customer value and can reach decarbonization goals faster.

Whatever the customer challenge, we endeavor to find the solutions.

**Powering a decarbonized world  
for everyone.**