



**IEA Bioenergy**  
*Technology Collaboration Programme*

## Status report on thermal gasification of biomass and waste 2021

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### Annex 6

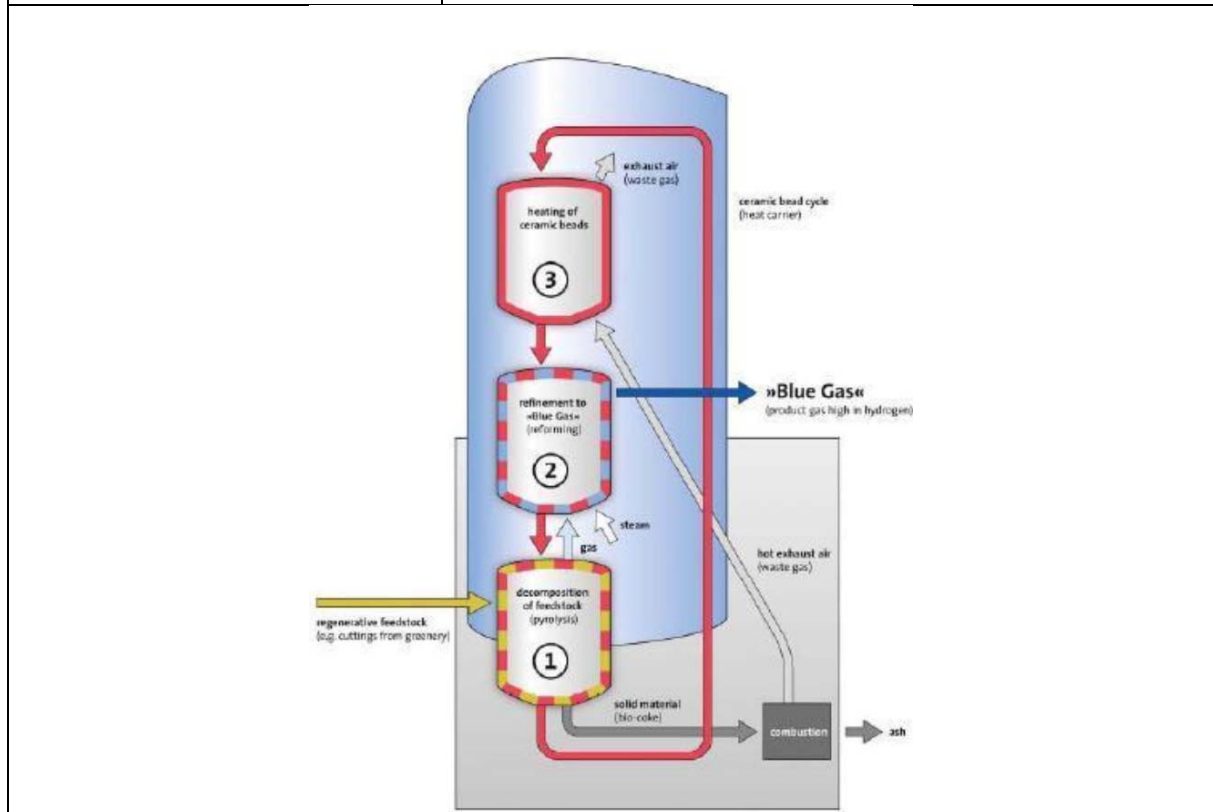
**Other gasification technology – Non-operational, historical (project cancelled before 2012), cancelled, stopped while under construction, deconstructed, idle, on hold**

	<b>Owner</b>	<b>Project name</b>	<b>Country</b>	<b>Page</b>
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Project name	Blue Tower Technology Herten
Project owner	H2Herten GmbH
Status	On hold
Start up	2009
Country	Germany
City	Herten
Type	TRL 6-7 Demonstration
Technology	Other Gasification Technology
Raw Material	lignocellulosics
Input 1	roadside greenery
Input 2	Syngas (13 MW)
Output 1	hydrogen (150 m3/h)
Output 2	heat
Partners	Blue Tower GmbH, Dresden
Technology Brief	Green hydrogen is expected to be produced in the blue tower using a multi-stage reforming process. The technique: green waste (roadside greenery) is decomposed at temperatures around 600°C of which 80 % is converted into gas. The remaining solids are converted into coke which can be used again to generate the process heat that is required. The gas produced is purified into a very hydrogen rich 'blue gas' (approx. 50% hydrogen) at approximately 950°C using water vapour. This hydrogen rich gas is concentrated into pure hydrogen or is used in gas motors to generate electricity. With a thermal input of 13 megawatts the process yields 150 cubic metres of hydrogen an hour and 37,500 MWh p.a. of electricity. This is equivalent to the energy consumption of 12,000 homes. The project is setting new technical as well as economical standards.
Contact	CHP Herten & other innovation





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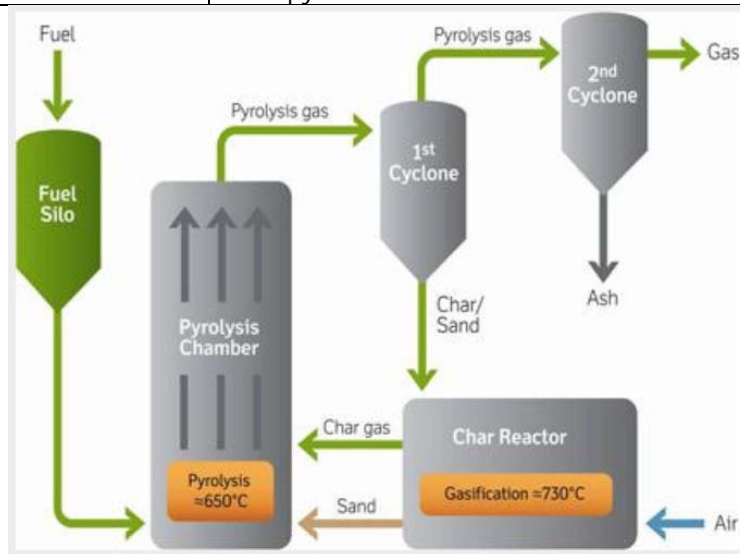
Project name	Wood co-gasification in IGCC
Project owner	NUON/Vattenfall
Status	Non operational (shut down)
Start up	2006
Country	The Netherlands
City	Buggenum
Type	TRL 9 Commercial
Technology	Other gasification technology (cofiring)
Raw Material	Biomass coal blends
Output 1 Name	Power (electricity)
Output 1 Capacity	30 MWe1 in 253 MWe1 coal plant
Partners	NUON/Vattenfall
Technology Brief	<p>NUON operates a 253 MWe coal gasification plant in Buggenum (the former Demcolec Power station). It is an Integrated Gasification Combined Cycle plant (IGCC) with Shell entrained flow gasification technology and Siemens gas turbine. After several successful biomass co-gasification trials with biomass input up to 30 wt%, the plant has been modified to co-gasify 30 wt% wood on a continuous basis. New biomass storage and feedings systems were put into operation in spring 2006. Since 2007, the plant has been operated with approximately 10% (energy) biomass. In 2011, activities were started to increase the co-firing share to 50% or more. In 2013 it was decided to close down the installation, due to low energy prices and relatively high cost of operation of the plant.</p>
Additional Information	<p><a href="http://www.nuon.com">www.nuon.com</a>  <a href="http://www.nuon.com/company/core-business/energy-generation/power-stations/buggenum/">http://www.nuon.com/company/core-business/energy-generation/power-stations/buggenum/</a></p>
Contact	Not known
	



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Project name	Pyroneer Demonstration Plant
Project owner	Pyroneer - Orsted A/S
Status	Non operational
Country	Denmark
City	Kalundborg
Type	TRL 6-7 Demonstration
Technology	Other Gasification Technology
Technology additional information	Low temperature circulating fluidized bed for co-combustion in CHP plant
Raw Material	lignocellulosics
Input 1	wheat straw
Output 1	other (6 MWth)
Output additional information	Gas
Technology Brief	The Pyroneer gasifier typically consists of three main components; a pyrolysis chamber, a char reactor and a recirculating cyclone. Cleaning the gas may simply be done with a second cyclone. Gas co-fired into coal boiler. Stable and safe operation demonstrated. Ash used for fertiliser field tests.
Additional Information	Status End 2015: Technology not sold, project mothballed, staff moved/fired
Contact	<a href="http://www.pyroneer.com">www.pyroneer.com</a>





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Project name	Wood gasifier Geertruidenberg
Project owner	RWE Essent
Status	idle
Start up	2005
Country	Netherlands
City	Geertruidenberg
Type	TRL 9 Commercial
Technology	Other gasification technology
Raw Material	Waste wood, RDF
Input Capacity	150.000 t/y
Output Name	Power (electricity)
Output Capacity	34 MWeI
Technology Brief	<p>At the Amer Power Station in Geertruidenberg, a CFB gasifier plant has been constructed to produce gas as fuel for the Amer-9 600 MWe pulverized coal power plant, which is operated as large CHP plant. The project originally was to be started in 2000. The 83 MWth gasifier is to convert about 150,000 t/y demolition wood, replacing 70,000 t/y of coal. The gasifier is a low-pressure Lurgi CFB operating at 750 - 850°C. Originally, the raw gas was to be cleaned from particles, ammonia, and tars before entering the coal boiler. This has been modified to the much simpler system where the raw gas is partially cooled to approximately 450°C and particulate reduction by cyclones. During commissioning, practical problems mostly related to the fuel supply system. After modifications and successful trials in 2005, the gasifier had to be stopped. In the Dutch interpretation of the European WID (Waste Incineration Directive), the complete coal-fired plant was identified in December 2005 as waste incinerator because of the demolition wood fired gasifier. This situation has been solved November 2006 by allowing wood gas on the national "white list" of clean biomass fuels under certain conditions related to the concentration of 9 heavy metals. The gasifier typically operates 5000 h per year.</p>
Additional Information	<a href="http://www.essent.nl">www.essent.nl</a>
Contact	W. Willeboer, RWE Essent wim.willeboer@essent.nl



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Project name	Veralia Champagne (Xylowatt)
Project owner	Saint-Gobain France
Status	On hold
Start up	2015
Country	France
City	Epernay
Type	TRL 9 Commercial
Technology	Other Gasification Technology
Technology additional information	Syngas for industrial purpose
Raw Material	lignocellulosics
Input 1	clean wood chips (class A) (240 kg/h)
Output 1	other (0.95 MW)
Technology Brief	<p>NOTAR® gasifier is a patented medium scale down-draft gasification technology. It is one of the few process which produces tar-free syngas from biomass. It is designed with a multi stage process and a splitting of the pyrolysis, combustion and reduction zones. This physical separation leads to a compact gasification unit producing a very high-quality syngas. The energy produced from solid biomass is then used as fuel to produce heat and power or for industrial applications.</p>
Additional Information	<a href="https://www.xylowatt.com/">https://www.xylowatt.com/</a>
Contact	Poskin Pierre-David +32 472 52 96 24