

Status report on thermal gasification of biomass and waste 2019

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Annex 2

Gasification facilities for CHP production – Non operational, historical (project cancelled before 2012), cancelled, stopped while under construction, deconstructed, idle, on hold

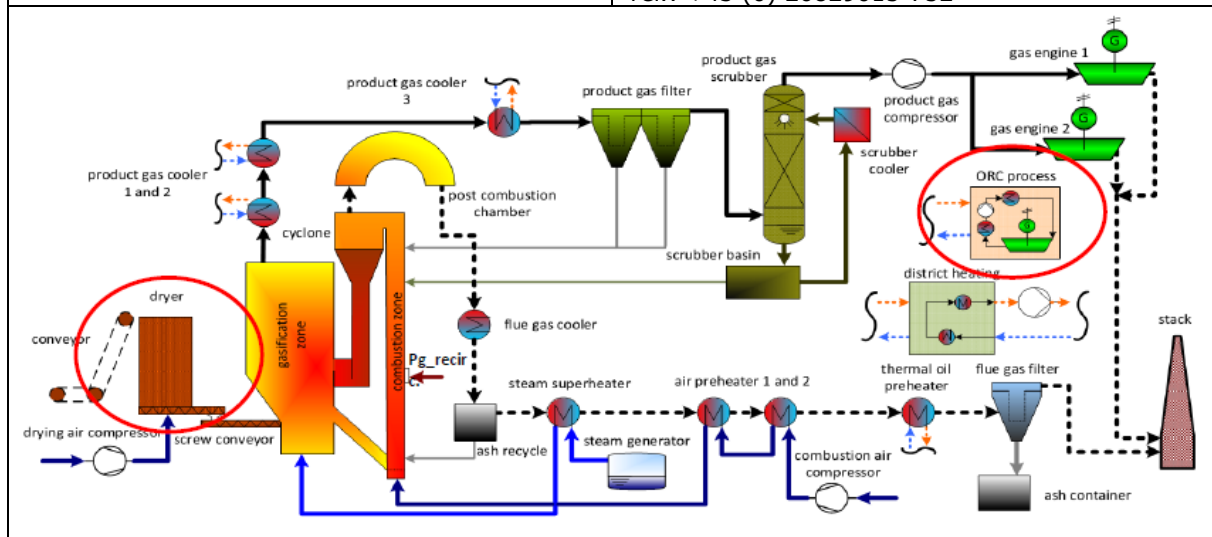
Owner	Project name	Country	Page
Aerni Pratteln	CHP Pratteln	CH	2
Biomasse Energie GmbH	FICFB Villach	AT	3
EMPA Dübendorf	CHP Dübendorf	CH	4
Energie Oberwart	FICFB Oberwart	AT	5
Güssing Renewable Energy	FIFCB Güssing	AT	6
Host	CFB Tzum	NL	7
MEVA	VIPP Demo	SE	8
VVBGC AB	Vaexjoe Vaernamo Biomass Gasification Center AB	SE	9
Weiss	Hillerod two stage gasifier	DK	10
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Project name	CHP Pratteln
Project owner	Aerni Pratteln
Status	Non operational
Start up	2009
Country	Switzerland
City	Pratteln
Type	TRL 6-7 Demonstration
Technology	CHP
Raw Material	Wood chips dried
Input 1 Name	Wood chips dries
Output 1 Name	Power (electricity')
Output 1 Capacity	0,13
Output 1Unit	MWeI
Output 2 Name	Heat
Output 2 Capacity	0,26
Output 2 Unit	MWth
Technology Brief	downdraft Kuntschar/Wegscheid/Aerni modified
Additional Information	Closed down due of technical reasons. Operational 2009-2014.
Contact	non

Project name	FICFB Villach
Project owner	Biomasse Energie GmbH
Status	Idle
Start up	
Country	Austria
City	Villach
Type	TRL 9 Commercial
Technology	CHP
Raw Material	Wood chips
Output 1 Name	Power (electricity)
Output 1 Capacity	3,7
Output 1 Unit	MWe1
Output 2 Name	Heat
Output 2 Capacity	6,7
Output 2 Unit	MWth
Technology Brief	FICFB gasifier
Contact	Not known

Project name	CHP Dübendorf
Project owner	EMPA Duebendorf
Status	Stopped while under construction
Country	Switzerland
City	Duebendorf
Type	TRL 9 Commercial
Technology	Power/CHP
Raw Material	Lignocellulosic crops
Input 1 Name	dried chips from waste wood
Output 1 Name	Power (electricity)
Output 1 Capacity	0,7
Output 1 Unit	MWeI
Partners	EKZ / Woodpower
Technology Brief	Downdraft Woodpower gasifier. After 2 Mio CHF investment project cancelled and abandoned
Additional Information	project stopped
Contact	non

Project name	FICFB Oberwart
Project owner	Energie Oberwart
Status	On hold
Start up	2008
Country	Austria
City	Oberwart
Type	TRL 9 Commercial
Technology	CHP
Raw Material	Wood chips
Output 1 Name	Power (electricity)
Output 1 Capacity	2,8
Output 1 Unit	Mwel
Output 2 Name	Heat
Output 2 Capacity	4,1
Output 2 Unit	MWth
Total Investment	16 Mio
Total Investment Currency	Euro
Partners	Ortner Anlagenbau
Technology Brief	FICFB, steam as oxidizing agent in gasification zone, air in combustion zone; the same technology as in Guessing, ORC added
Additional Information	
Contact	Ing. DI (FH) Dr. Klaus Bosch Tel.: +43 (0) 26829015-752



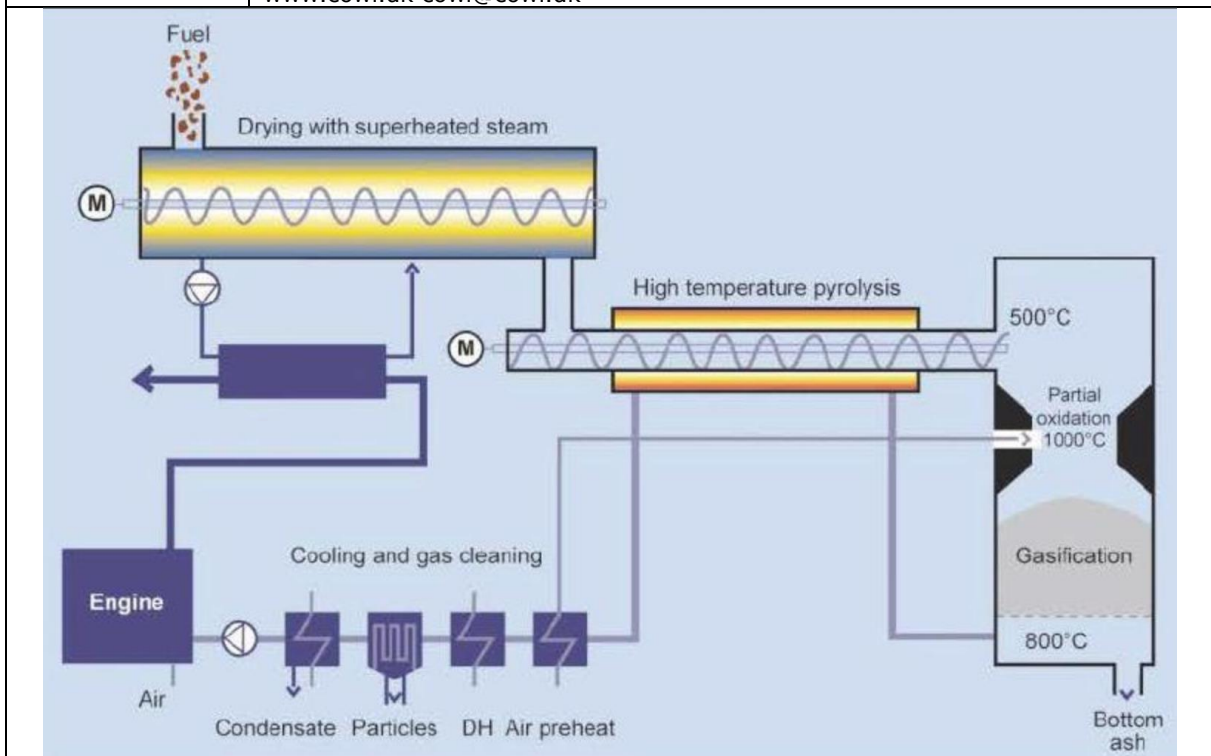
Project name	FICFB Guessing
Project owner	Guessing Renewable Energy
Status	On hold
Start up	2002
Country	Austria
City	Guessing
Type	TRL 9 Commercial
Technology	CHP
Raw Material	Wood chips
Input 1 Capacity	3
Input 1 Unit	t/h
Output 1 Name	Power (electricity)
Output 1 Capacity	2
Output 1 Unit	MWel
Output 2 Name	Heat
Output 2 Capacity	4,5
Output 2 Unit	MWth
Partners	Austrian Energy
Technology Brief	The basic idea of the FICFB concept is to divide the fluidised bed into two zones, a gasification zone and a combustion zone. Due to the favourable characteristics of the product gas (low nitrogen, high hydrogen content) there are several research projects, which use slip streams of the product gas.
Contact	Ing. Reinhard Koch r.koch@eee-info.net
	<p>The diagram illustrates the FICFB process. Biomass is fed into a fluidized bed reactor consisting of two zones: a gasification zone and a combustion zone. Air for combustion is supplied to both zones. The gasification zone produces gasification gas, which passes through a heat exchanger, a bag filter, and a scrubber. The combustion zone produces product gas, which passes through a heat exchanger, a bag filter, and a catalyst. Both gas streams are then burned in a product gas burner. The burner's output goes through a heat exchanger and a chimney. Ash is collected as bed ash and fly ash.</p>

Project name	CFB Tzum
Project owner	HoSt
Status	idle
Start up	2006
Country	The Netherlands
City	Tzum
Type	TRL 6-7 Demonstration
Technology	CHP
Raw Material	Chicken manure
Output Name	Heat
Output Capacity	3
Output Unit	MWth
Technology Brief	<p>HoSt constructed a 3 MWth chicken manure gasifier in Tzum in the Netherlands. The gasifier is a circulating fluidized bed (CFB). The gas is used in a low-NOx gas boiler to produce heat and electricity. The chicken farm uses the heat. Power is delivered to the grid. The plant has been successfully started spring 2006. During 2006 and 2007 several improvements have been made (new ash removal system, new fuel dryer, ...). it has been operated 3500 h in 2007. Mein problem remains the supply of sufficiently dry fuel (chicken manure). HoSt constructed a second chicken manure gasifier in Portugal as part of a 1 MWe CHP plant in 2010.</p>
Additional Information	http://www.host.nl
Contact	Not known
	

Project name	VIPP Demo
Project owner	MEVA Innovation
Status	Deconstructed
Start up	2012
Country	Sweden
City	Hortlax
Type	TRL 6-7 demo
Technology	CHP
Raw Material	Lignocellulosic crops
Input 1 Name	Biomass pellets
Output 1 Name	Power (electricity)
Output 1 Capacity	1,2
Output 1 Unit	MWth
Output 2 Name	Heat
Output 2 Capacity	2,2
Output 2 Unit	MWth
Partners	Pite Energi, Cummins Ltd, Envibat AB
Technology Brief	Crushed pellets were pneumatically fed with air into a cyclone gasifier. The resulting gas was cooled and the quenched in a co-current scrubber using a biooil. After separation of the liquid, the gas was cleaned in a WESP prior to be routed into the gas engine.
Additional Information	www.mevaenergy.se
Contact	Niclas Davidsson info@mevaenergy.se niclas.davidsson@mevaenergy.se +46 708 40 72 41

Project name	Växjö Värnamo Biomass Gasification Center AB
Project owner	VVBGC AB
Status	Idle
Start up	1995
Country	Sweden
City	Värnamo
Type	TRL 6-7 Demonstration
Technology	Other gasification Technology CHP/Synthesis
Raw Material	Lignocellulosic crops
Input 1 Name	Woody biomass, agrowaste
Output 1 Name	Power (electricity)
Output 1 Capacity	6
Output 1 Unit	MWel
Output 2 Name	Heat
Output 2 Capacity	8
Output 2 Unit	MWth
Output 3 Name	Clean syngas
Output 3 Capacity	1000
Output 3 Unit	m3/h
Partners	Foster Wheeler, E.ON for CHP
Technology Brief	<p>The plant was originally built for CHP production based on an IGCC concept. Fuel was fed by means of a lock hopper system. The gasifier was an airblown CFB operating at approx 20 atm. Downstream of the gasifier and its associated cyclone, the gas was cooled to 400 C and then passed a hot gas filter in which particulates were removed. The gas was then directly routed to either the flare or an SGT100 gas turbine. Bleed air from the gas turbine compressor was used in the gasifier after pressure boosting. The exhaust gas from the turbine passed a HRSG generating steam at 45 bar 450 C and also some district heating before being released to the stack.</p> <p>The steam was used in a steam turbine, after which there was a district heating condenser. The plant was operated in this way until 2000 when it was mothballed.</p> <p>There has been several attempts to revive the plant for use as a steam-oxygen blown unit for synthesis gas production. The last attempt failed in 2011 for lack of industrial financing.</p>
Additional Information	www.vvbgc.se
Contact	Gunnar Crona email: info@vvbgc.se +46 370 69 41 00

Project name	Hillerod two stage gasifier
Project owner	Weiss
Status	Non operational
Country	Denmark
City	Hillerod
Type	TRL 6-7 Demonstration
Technology	CHP
Raw Material	Wet wood chips
Output 1 Name	Power (electricity)
Output 1 Capacity	0,5
Output 1 Unit	MWel
Output 2 Name	Heat
Output 2 Capacity	1
Output 2 Unit	MWth
Partners	DTU, Weiss, COWI
Technology Brief	Staged down draft Gasifier Developed and patented by DTU, Scale-up by Weiss and DTU, Licensed by COWI
Additional Information	Plant has been dismantled, Weiss has filed bankruptcy and ceased operations
Contact	http://www.dtu.dk/english/service/phonebook/person?id=6144&tab=1 www.cowi.dk cowi@cowi.dk



Project name	CHP Wila
Project owner	Woodpower in Wila
Status	Non operational
Start up	2007
Country	Switzerland
City	Wila
Type	TRL 9 Commercial
Technology	Power/CHP
Raw Material	Lignocellulosic crops
Input 1 Name	dried chips from demolition wood
Output 1 Name	Power (electricity)
Output 1 Capacity	0,38
Output 1 Unit	Mwel
Output 2 Name	Heat
Output 2 Capacity	0,425
Output 2 Unit	MWth
Partners	EKZ
Technology Brief	Downdraft Woodpower gasifier. oprational 2007-11; 2011 end of operation, 2012 dismantled