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Swiss Federal Office of Energy SFOE

Thermal Gasification of Biomass Country Report Switzerland (brief update)



Martin Rügsegger, *ETECA GmbH*, CH-3617 Fahrni

IEA Bioenergy, Task 33, Meeting October 2011, Pitea, Sweden



General Swiss Energy Policy + Programs

- General policy made by Swiss Federal Office of Energy (SFOE)
 - High efficiency
 - Increasing renewable energy
- CO₂ Act (Kyoto)
 - emissions reduction of 10% by 2010 (aim not fulfilled)
 - and of 20% by 2020 compared to 1990 levels
- Approved action plans by Swiss Federal Council 2008
 - 50% renewable energy to overall energy consumption
 - reduce the consumption of fossil fuels by 20 per cent by 2020
 - 2010 -2020 max 5% increase of electricity consumption
 - After 2020 stabilise electricity consumption
- Vision
 - The 2000 Watt society is a long-term vision of sustainable per capita energy consumption



General Swiss Energy Policy + Programs

- Programs
 - REN-Projects by the Cantons (CO₂ –contribution)
 - Cost-covering remuneration for feed in the electricity grid
 - El. + 5'400 GWh/a from renewables (+10% of total) by 2030
 - Biomass: Large increase of power production with CHP
- Further Information Swiss Federal Office of Energy (SFOE)
 - www.admin.bfe.ch
 - [Position papers](#) : Bio fuel, Energy from Biomass, Energy from Biomass Wood
 - [Federal government energy research concept 2008-2011](#)
 - [Biomass and Wood energy research concept 2008-2011](#)
 - [Swiss Strategy for production, treatment and use of biomass](#)
- Facts
 - In the year 2009, 56.15% of Switzerland's overall electricity production comes from renewable sources; hydropower was by far the biggest contributor (96.5%).



Research Activities

Thermal Gasification of Biomass

- PSI www.psi.ch
 - Gasification of dry biomass (wood, grass)
 - Co-firing in NGCC for power generation
 - High temperature fuel cells for CHP
 - Gas processing for SNG production <http://tpe.web.psi.ch/>
 - Dr. Serge Biollaz http://tpe.web.psi.ch/person/per_biollaz.htm
 - Gasification of moist biomass (manure, algae)
 - For SNG production
 - Dr. Frédéric Vogel http://cpe.web.psi.ch/CPE/per_Vogel.html



Swiss Industries 2010

Thermal Gasification of Biomass

- EKZ

- Supplier for turnkey biomass gasifier plants (BMG technique similar to WILA Woodpower)
- Energy contracting for biomass cogenerating plants

www.ekz.ch



- Pyroforce Energietechnologie AG

- Supplier for turnkey biomass gasifier plants (BMG technique according to Stans Nidwalden)
- Other projects: Güssing: 300 kW_{el} 2 gasifiers; 2009
 Spiez: 200 kW_{el} 1 gasifiers; 2000-2007

www.pyroforce.ch



- XyloPower AG

- Supplier for turnkey biomass gasifier plants (BMG Technique similar to WILA)

www.xylopower.com



- Foster Wheeler AG (published March 2010 Infos about BTL-Plant in Finland)

- Foster Wheeler AG in Baar Switzerland (April 2010 Zug)
- Foster Wheeler Managment AG in Geneva Switzerland



News Swiss Projects October 2011

Thermal Gasification of Biomass

- EMPA EAWAG Dübendorf CHP gasifier Plant
Project is in the stage of detail planning; awaiting building permission
 - Supplier will be EWZ Woodpower-type gasifier
 - 2 x 350 kW el
- Woodpower Wila out of operation since 1. of July 2011
- 3 MW Gasifier Project for brick production in rotating furnace
 - fuel gas shall replace fossil fuel
 - The fuel gas will be produced by 3 gasifier units each 1 MW
 - Test with 1 MW unit gasifier estimated in the beginning of 2012
 - similar CO₂ reduction project in discussion for several brick plants
- PSI: Biomethane Development => 20-80MW BM-to-SNG Pilot plant in discussion based on BFB methanation technology



Thermal Biomass Gasification CHP-Plants in Switzerland Summary 1, March 2011

	Aerni in Pratteln	Holzstrom in Stans	Woodpower Wila	Woodpower EMPA
Gasifier	1 Kuntschar	8 Pyroforce	1 modified Dasagren	2 modified Dasagren
Type	downdraft	2-zone downdraft	downdraft	downdraft
Gas engine	1 x 130 kW Adapt. MAN	2 x 690 kW Jennbacher	1 x 350 kW Jennbacher	2 x 350 kW
Waste heat therm	230 kW for district heating	1,2 MW for district heating	425 kW for wood chip drying	district heating
extra Boiler	2MW wood chip district heating	1,6 MW W'chips + 1,7 MW oil for district heating	200 kW waste coal for district heating	?
Commissioning	2009	2007	2007	2012/13
Remarks	in modification	24h_7d p week operation	in 24h_7d p week operation	

out of operation since July 2011

Approved project in planning



Thermal Biomass Gasification CHP-Plants in Switzerland Summary 2, October 2011

	Aerni in Pratteln	Holzstrom in Stans	Woodpower in Wila	Woodpower EMPA
Fuel	Dry clean wood chips	Dry demolition wood/scrap wood chips	Dry waste wood chips	Dry waste wood chips
Moisture	8%	10%	12%	?
Operating hours last 6 Months	?	Block 1: 4'200h Block 2: 3'800 h	12'000 h	n.a.
Declared revision / modification	Gasifier	Block 1: non Block 2: non		
Total live time operation h Oct of 2011	?	Block 1: 12'300 h Block 2: 19'700 h	16 000 h Motor 20 000 h Gasifier	n.a.
Remarks	New design of gasifier		5 Year approval as waste incineration plant	

out of operation since 1. July 2011

Approved project in planning



Thermal Biomass Gasification CHP-Plants Pratteln Switzerland

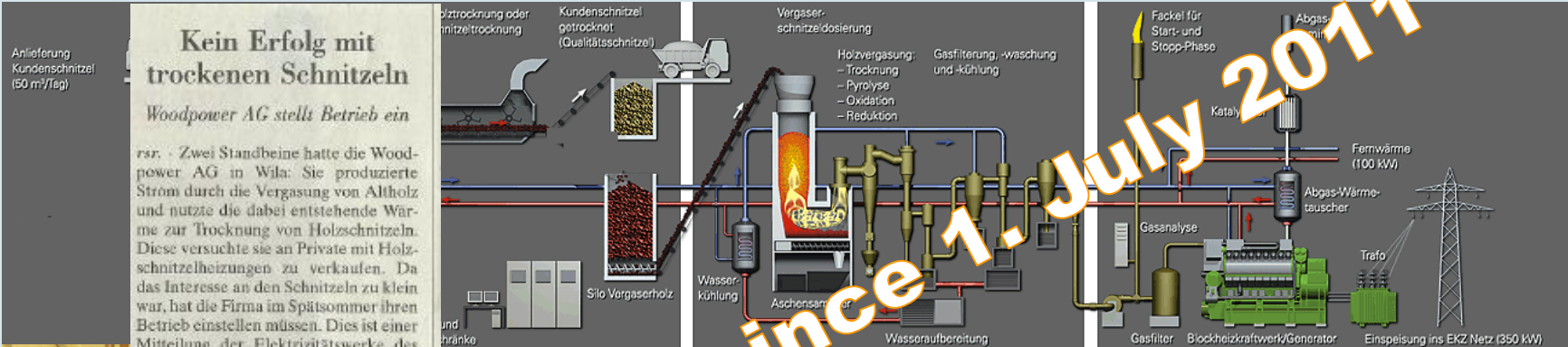


M Rügsegger *ETECA GmbH*; CH-3617 Fahrni
IEA Bioenergy: Task 33 Thermo Gasification of Biomass

Pitea Sweden
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Thermal Biomass Gasification CHP-Plants Wila Switzerland



Anlieferung Kundenschnitzel (50 m³/Tag)

Kein Erfolg mit trockenen Schnitzeln

Woodpower AG stellt Betrieb ein

rsr: Zwei Standbeine hatte die Woodpower AG in Wila: Sie produzierte Strom durch die Vergasung von Altholz und nutzte die dabei entstehende Wärme zur Trocknung von Holzchnitzeln. Diese versuchte sie an Private mit Holzchnitzelheizungen zu verkaufen. Da das Interesse an den Schnitzeln zu klein war, hat die Firma im Spätsommer ihren Betrieb einstellen müssen. Dies ist einer Mitteilung der Elektrizitätswerke des Kantons Zürich (EKZ) vom Donnerstag zu entnehmen. Die EKZ waren als Minderheitsaktionär zu 49 Prozent an Woodpower beteiligt. Wie Priska Labáda, Sprecherin der EKZ, auf Anfrage erklärt, kommt es durch die Geschäftsaufgabe zu keinen Entlassungen. Und die EKZ müssten keinen finanziellen Verlust hinnehmen; die 2007 getätigte Investitionen von 6 Millionen Franken seien vollumfänglich abgeschlossen.

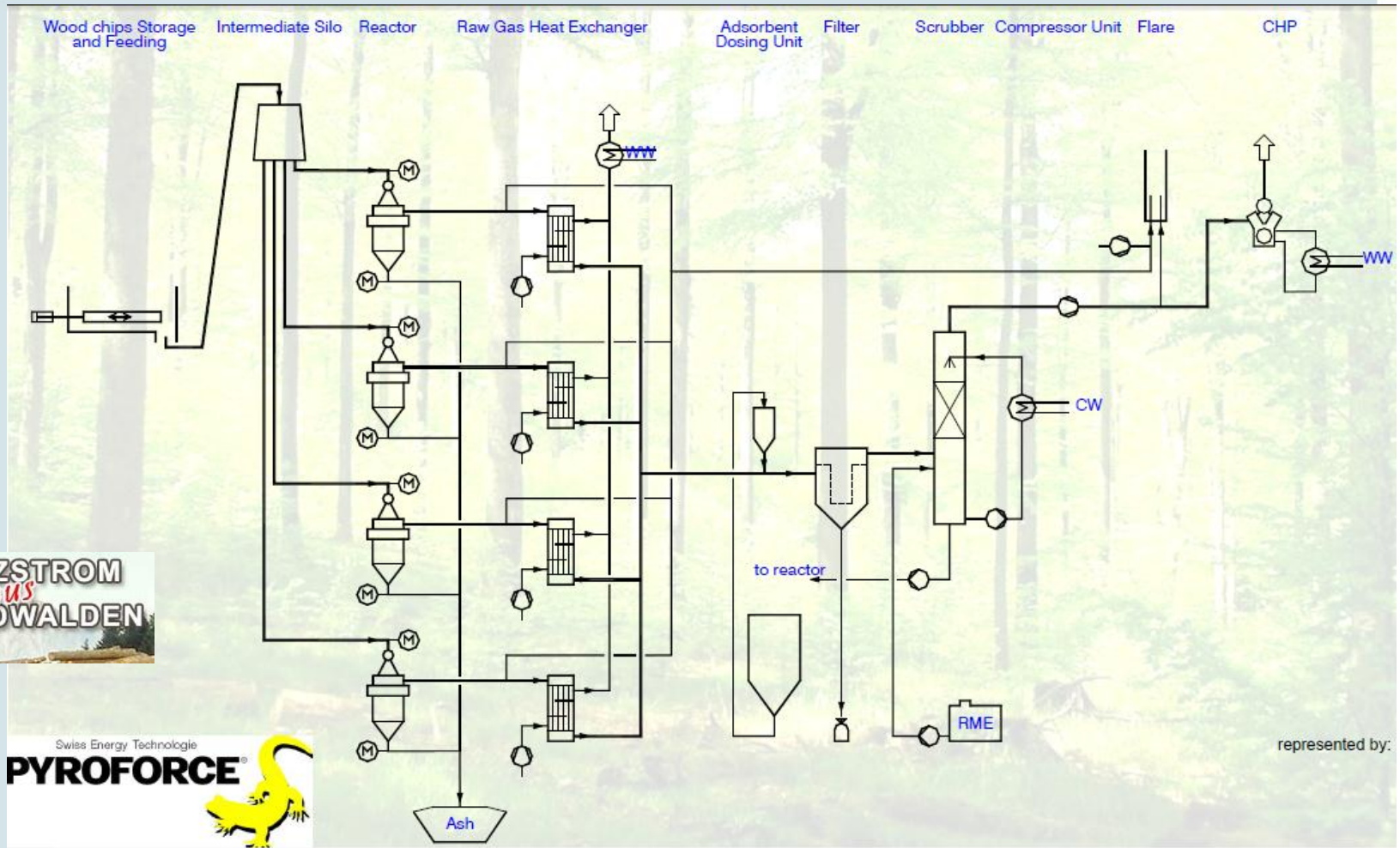
Das Scheitern von Woodpower ist für die EKZ in keinster Weise ein Erfolgspotenzial. Holzvergasung zu zweifeln. Die neue Anlage in Wendo... aut werden, welche Ea- und Empa mit Abwärme und zwei... 10 Kilowattstunden Strom verbringt. Der gegenüber normalen Verbrennungsanlagen höhere Wirkungsgrad bei der Vergasung rührt daher, dass Strom und Wärme produziert werden. Nicht rentiert hat die Anlage in Wila, weil die Abwärme neben dem defizitären Trocknen von Schnitzeln nicht anderweitig genutzt werden konnte.



out of operation since 1. July 2011



Thermal Biomass Gasification CHP-Plants Stans Switzerland 1





Thermal Biomass Gasification CHP-Plants Stans Switzerland 2

