



**IEA Bioenergy**  
Technology Collaboration Programme



## Country report Sweden

### IEA Task 33 - Thermal gasification of biomass and waste

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Online meeting, June 29-30

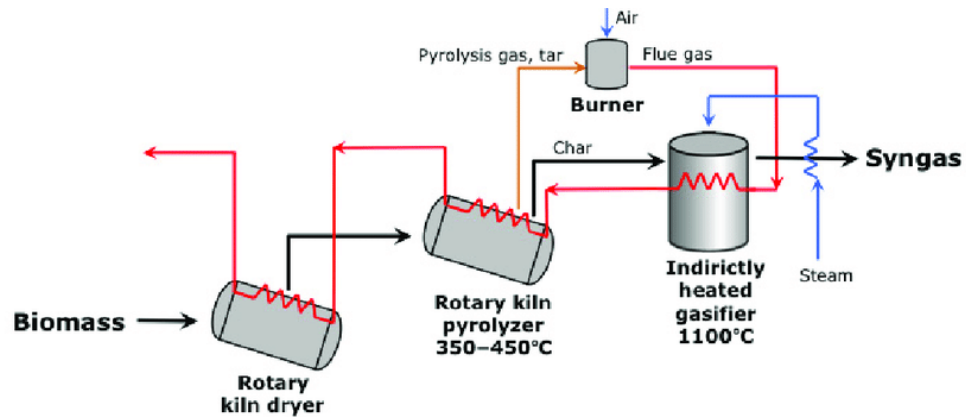
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**Technology Collaboration Programme**

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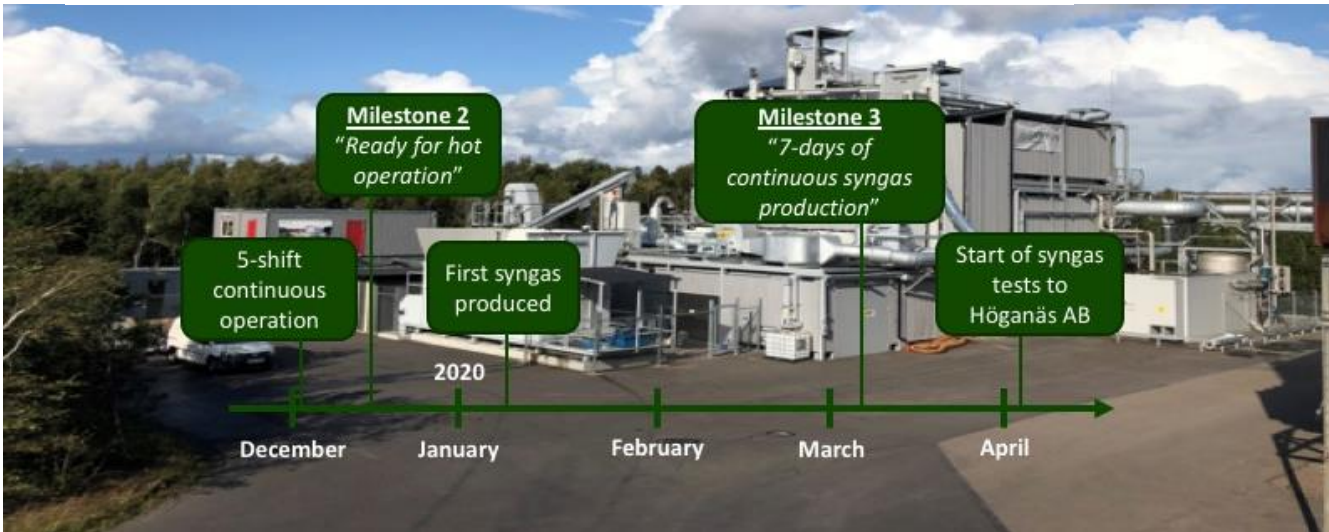
# Commercial gasification projects - current status

# Cortus 6 MW WoodRoll® gasifier at the Höganäs steel plant



- First gas production in March 2020 - but with bio-coal from another plant
- Currently, issues with the safety system (flare)
- Expected 7 days of full operations without stop producing pressurized syngas in the near-term

More info at <http://cortus.se>



# Cortus WoodRoll® in Mariposa (US)

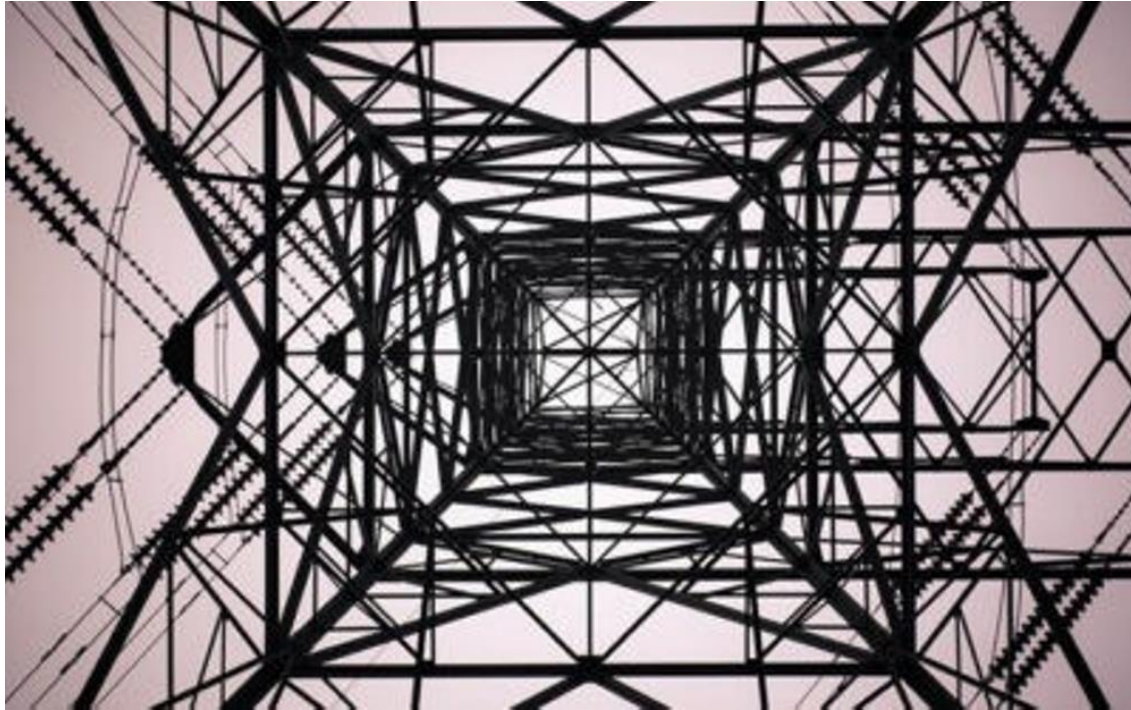


Photo from <http://cortus.se>

- Biomass-to-electricity project in Mariposa
- Pacific Gas & Electric (PG&E) has approved Cortus and the Mariposa-project for delivery of 2,7 MW electricity.
- Cortus can now participate in forthcoming auctions within the BioMAT-program

More info at <http://cortus.se>

\* Bioenergy Feed-in Tariff Program, [https://www.cpuc.ca.gov/SB\\_1122](https://www.cpuc.ca.gov/SB_1122)

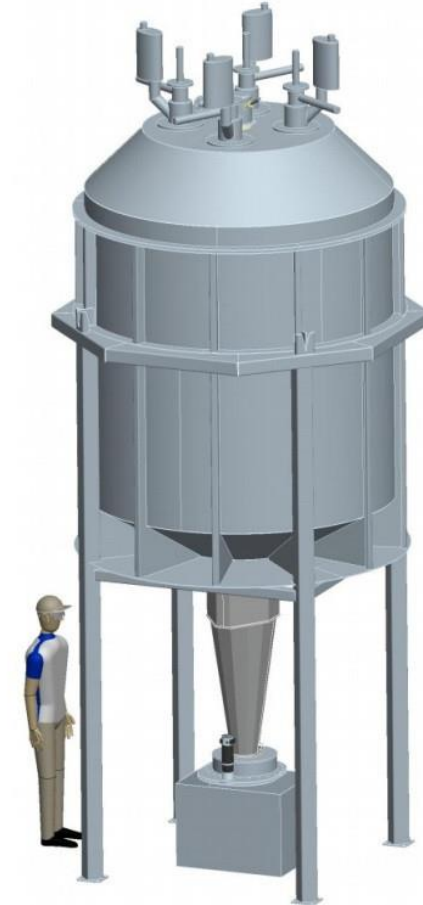
# Cortus WoodRoll® & ENGIE (Fr)

- Collaboration project (WoodHy) initiated 2019 on biomass-to-hydrogen project in Bordeaux, France
- An order from **Engie Cofely** worth 135 000 € to carry out an **Advanced Feasibility Study** of a plant for hydrogen and CO<sub>2</sub> production

More info at <http://cortus.se>

**Woodroll  
Gasifier**

 **CORTUS**



# Cortus WoodRoll® & Float Production AS (No)

**Woodroll  
Gasifier**

 **CORTUS**



- Production of biomethanol using WoodRoll®
- Fuel tests in lab scale to be carried out

# MEVA CHP-plant in Hortlax



- Entrained flow cyclone gasifier emanated from research at Luleå University of Technology
- Energy outputs 1.2 MW<sub>el</sub> and 2.4 MW<sub>th</sub>
- Small fraction fuels (sawdust, wood fibers and agricultural residues)
- Applications: CHP, fossil process gas replacements and industrial drying processes
- Current focus on tar removal and utilization of biochar

More information at <http://mevaenergy.com>

# Commercial initiatives under development



# Gobigas plant in Gothenburg



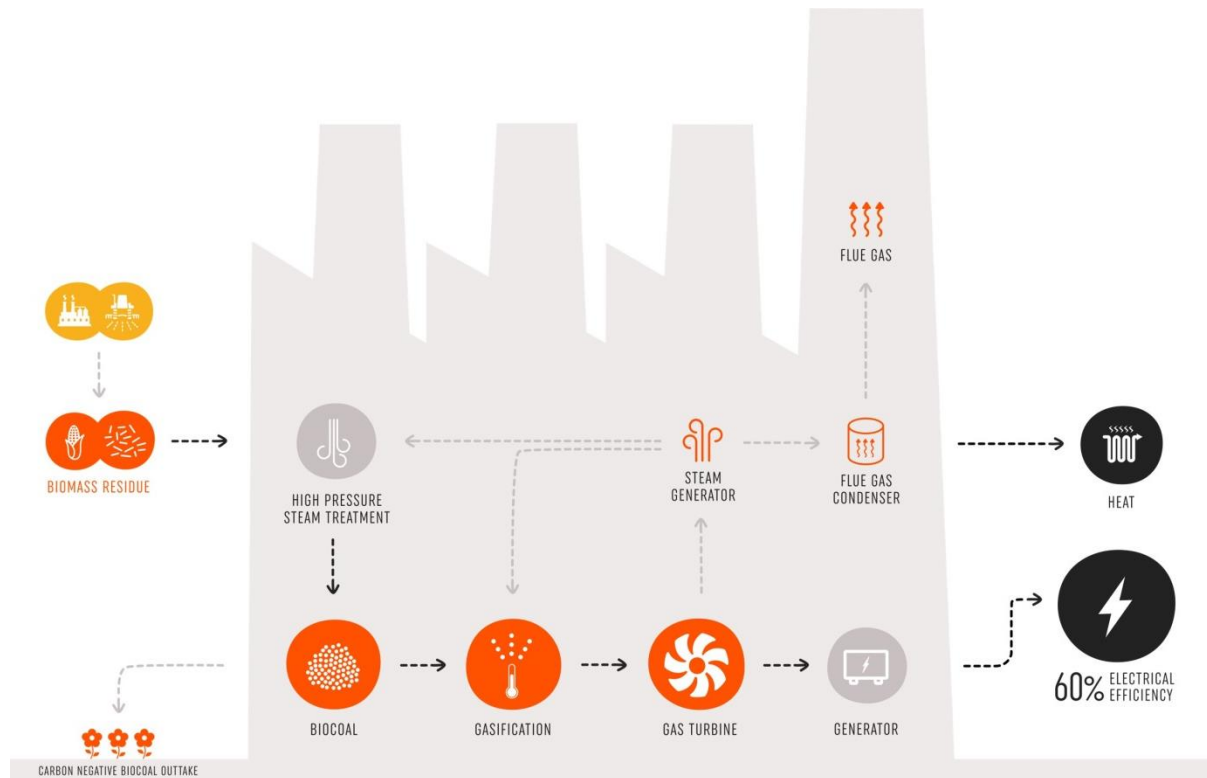
- First stage of a 2-stage scheme aimed to reach 1 TWh/a bio-SNG
- Economy failed when energy prices dropped in 2014. **Now plant is moth-balled and for sale**
- Meetings are currently held with **several new industrial stakeholders**

# LTU Green Fuels plant

- Still moth-balled to a high cost
- Discussions with the Swedish Energy Agency
- Large risk for dismantling



# Phoenix Biopower



- The Biomass-fired TopCycle (BTC) - high-pressure steam treatment and entrained flow gasification
- Gas turbine for power generation
- Aiming at electrical efficiency of up to 60 %
- Funding for a pre-study on a pilot plant together with Tekniska Verken in Linköping

More information at <http://phoenixbiopower.com/>

# Research activities

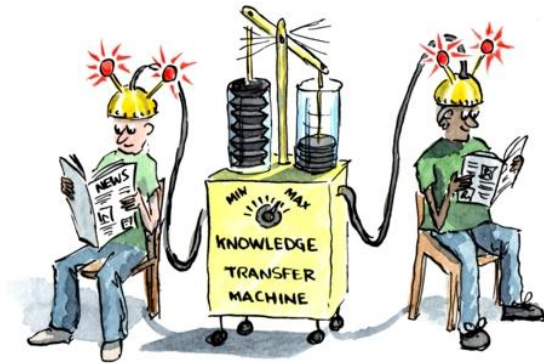
# Ongoing Swedish Gasification-related R&D Programs

- Swedish Gasification Centre (SFC): 2011-2021, budget 54 M€
- Swedish Knowledge Centre for Renewable Transportation Fuels (f<sup>3</sup>): New phase 2018-2021, budget 3.3 M€
- Swedish Energy Agency's biofuel program: On-going 2017-21. Both thermal and biochemical conversion, budget 18 M€
- Biofuels for Sweden 2030: 2017-20, budget 0.6 M€

# Swedish Gasification Centre (SFC)



- Strengthen and coordinate Swedish gasification R&D and foster a new generation of gasification competence in Swedish academy and industry
- Serve as a national network for knowledge transfer and problem solving within the field of gasification
- In total, 19 companies, 8 universities and one research institute
- 25-30 senior researchers and 30-35 PhD students
- Produced >35 PhDs and >400 journal and conference publications (2012-2019)
- [www.sfc-sweden.se](http://www.sfc-sweden.se)



# Participating universities, institutes and authorities



**CHALMERS**



GÖTEBORGS UNIVERSITET



LUNDS  
UNIVERSITET  
Lunds Tekniska Högskola



**RI  
SE**



# Participating companies





# Swedish Gasification Centre (SFC)



- Current program ends April 2021
- Plan for a renewed research program with broadened scope and increased industrial relevance
- Industrial co-funding uncertainties due to forthcoming RED II implementation and COVID-19

# Policy issues influencing gasification technologies

- The **reduction obligation for transport fuels** forces fuel distributors to blend in pre-determined shares of renewable fuels into fossil diesel and gasoline or pay fairly large fines
- The reduction obligation in itself is good, but in the current form, it **fails to promote domestically produced biofuels**
- Sweden has now instead become a **very large importer of HVO**, which is, in the long term hardly sustainable. SFC has published a position paper in the matter, see [www.sfc-sweden.se](http://www.sfc-sweden.se)

# Policy issues influencing gasification technologies

- A governmental investigation on the biogas market proposes to give **economic support to biogas/biomethane** - but only if produced via anaerobic digestion
- **No premium for biomethane produced via gasification** - further investigations planned
- SFC has via **several statements of opinions** to the ministry from partner universities and companies **strongly argued against this proposal**

# Thanks!

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