LIGNO SYS

System study of lignocellulosic feedstock for biomethane production

The LignoSys project
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Jörgen Held, Renewtec AB

http://lignosys.renewtec.se

Project formalities

Project period: 1 January 2016 – 30 June 2018

Project budget: 2.415 MSEK out of which 1.365 MSEK is public funding

Project partners: Cortus Energy AB • DGC, European Biogas Association • G4 Insights Inc. • Institute for Biogas • Waste Management & Energy • Lund University • Montanuniversität Leoben • OX2 Bio AB • Renewtec AB • SYSAV Utveckling AB

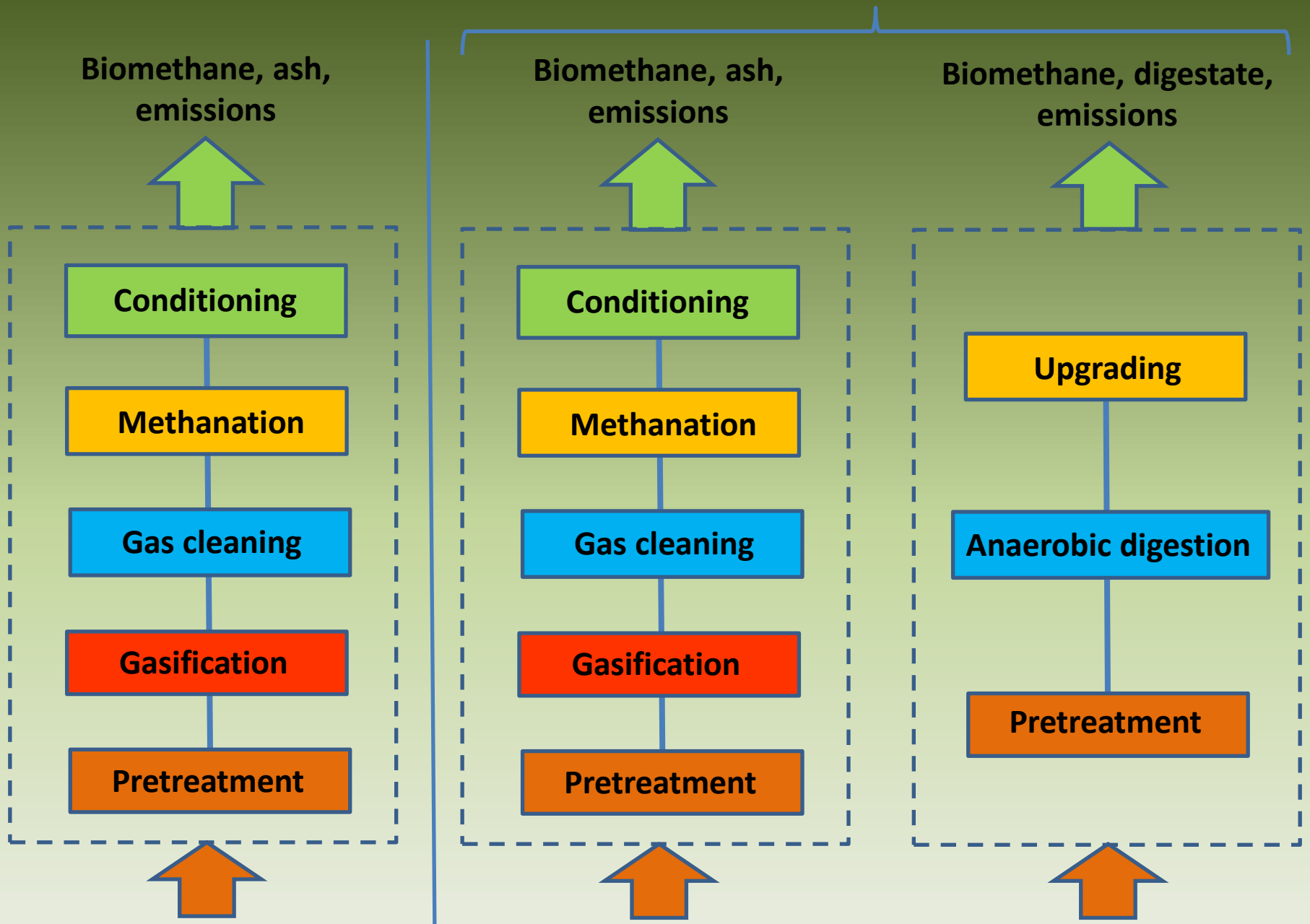
Project targets

- Make a system study* for three thermo-chemical biomethane routes, Heatpipe Reformer, WoodRoll® and PyroCatalytic Hydrogenation based on woody biomass
- Make a system study* for the thermochemical routes and for anaerobic digestion in comb-ination with pretreatment and upgrading, for non-woody lignocellulosic feedstock

* energy, resource, cost efficiency and GHG emissions perspective

Project targets

- Identify synergies between the bio- and thermochemical conversion routes


Biomethane, ash, emissions
Conditioning
Methanation
Gas cleaning
Gasification
Pretreatment
Biomethane, ash, emissions
Conditioning
Methanation
Gas cleaning
Gasification
Pretreatment
Biomethane, digestate, emissions
Upgrading
Anaerobic digestion
Pretreatment
Woody biomass as feedstock
Non-woody lignocellulosic feedstock

Partner roles

Lund University – conduct the system analysis

DGC – lab scale test with heatpipe reformer

Montanuniversität – info on heatpipe reformer and input to system analysis modelling

European Biogas Association – access to biogas network, dissemination activities

Institute for Biogas, Waste Management & Energy – input related to anaerobic digestion

Partner roles

G4 Insights Inc. – provide info on PyroCatalytic Hydrogenation

Cortus Energy AB – provide info on WoodRoll®

OX2 Bio AB – provide industrial view on the project and primary receiver of the results

SYSAV Utveckling AB – provide industrial view on the project and primary receiver of the results

Renewtec AB – project coordinator, gather info, economic analysis, dissemination activities

Activities/results so far

- Kick-off meeting
- Project website
- Study tour at the Cortus pilot plant in Köping
- Selection of input parameters (e.g. water and ash content), pretreatment methods and upgrading technology, required gas quality etc
- Input data (battery limits) have been collected for the thermochemical routes
- Complete interface (gasifier system/upgrading unit) has been calculated by external partner

Activities/results so far

- DGC has installed the lab scale heatpipe reformer and is prepared to do the gasification tests with straw
- The system studies are ongoing

As a result of the project meetings a new idea how to more than double the biomethane yield from straw has been proposed (AD-PRIME).

Why biomethane?

- Highest conversion efficiency from feedstock to fuel of todays commercially available 2nd generation biofuels (typically 60-70%)
- The most versatile fuel
- Ultralow emissions
- Miscible in any proportion with natural gas
- Takes advantage of the global development of natural gas applications and infrastructure

REGATEC 2018

3-4 May 2018

Toulouse, France

www.regatec.org

REGATEC has a technical and industrial focus and is directed towards biomethane production through bio-, electro- and thermochemical conversion of biomass and waste, and biomass gasification for CHP production and industrial use.

REGATEC is organized by Renewtec AB and Institute for Biogas, Waste Management & Energy

Why biomethane?

- Natural gas is expected to take over the role as the dominating fuel during this century
- There is an EU directive stating that there should be refuelling stations for compressed methane at least every 150 km for the European NGV fleet to be able to circulate within the member states. Biomethane offers a sustainable off-grid solution in areas without a natural gas grid (cf refuelling stations with upgraded biogas)

Why small scale biomethane?

- Lower economic risk
- Easier to secure the feedstock supply (incl. low quality feedstock)
- Easier feedstock logostic
- Easier to match the excess process heat with local heat and steam demand
- Can be implemented by non-commercial players

Why small scale biomethane?

- The high specific investment cost associated with down-scaling can be circumvented by opting for gasification technology developed for small scale facilities (i.e. indirect gasification).