

Joint Workshop

Task 39/44

"Role of biofuels production / biorefineries in grid balancing"

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The workshop was moderated by Jim McMillan (T39) and Jaap Kiel (T44).

Agenda

Welcome

T39

- short introduction (Jim McMillan) - 5 Minutes
- T39 presentations each 10-15 minutes + discussion
- Franziska Müller-Langer „SynBioPTx to use synergies of the biobased and powerbased routes“
- Gudbrand Rødsrud “Borregaard- The worlds most advanced biorefinery in operation - a peek into our secrets”

T44

- short introduction (Daniela Thrän) - 5 Minutes
- T44 presentations each 10-15 minutes + discussion
- Tilman Schildhauer “Dimensions and options of flexible energetic use of biomass”
- Esa Kurkela “FLEXCHX - Flexible combined production of power, heat and transport fuels from renewable energy sources”

Discussion

Abstract:

Due to increasing production of electricity from fluctuating renewable sources like wind and solar, the role of bioenergy in the electricity sector has to be more flexible for grid stabilisation and secure supply. On the other hand, surplus power can be used in biofuels production and biorefinery processes to increase conversion rates and fuels output. Several concepts to produce heat, electricity, fuels and other products in single high-efficiency processing plants are under development. The aim of this workshop is to provide an overview on the flexibility options, get insights into concepts for more flexible biofuel and biopower production, and discuss the challenges and success factors to implement these concepts in energy systems with high shares of renewables.

FRANZISKA MÜLLER-LANGER „SYNBIOPTX TO USE SYNERGIES OF THE BIOBASED AND POWERBASED ROUTES“

Questions and Answers:

Tilman: Which are the biomasses used for the process?

Franziska: Technical question-hydrothermal procession for pre-treatment for straw and biogas process. Also here biowaste, sludge- need for closed circles

How to integrate renewable energy? In the pilot plane hydrogen will be with tanks- but this is a big/key question- how to storage hydrogen.

Jim: Requirement for biogas- is there enough to produce; Franziska: yes, there is.

Gudbrand: What will the added costs for renewable energy be if we have to build large storage capacity?....will be discussed after Gudbrands presentation.

GUDBRAND RØDSRUD "BORREGAARD- THE WORLDS MOST ADVANCED BIOREFINERY IN OPERATION - A PEEK INTO OUR SECRETS"

Questions and Answers:

Leif: market demand for ??? product???

Gudbrand: 15.000 tons, still not done, takes along time to get into the market; more than 1000 customers, sourced out the sampling; lot of interest in this.

Jim: Norway situation with hydropower/wind options are very special; how would you look at the power supply in other countries? How to tackle the higher energy costs in other countries.

Gudbrand: Transport of biomass is costly. A new biorefinary has to be close of the biomass (transport is cost infe), combined heat and power plant (wood chips).

Jaap: Flexibility, how to created or improved the products to impliment into the market?

Gudbrand: Geografie gives the flexibility- you can ship products to the area where is needed; have a range of products, supply the booming industries, focus on regions with special needs, which industry is moving, there you can supply; products do a job in customers service.

Jim: How much designing extra do you need for the flexibility (buildings, chemical)?

Gudbrand: We use the same reactors for the products; we are quite strict to build stocks, instead close contact to the customers.

Alok: we don't have wood in India, experienced with lignin, but too much ash, conversion of lingo sulphinate are sheeper- do you have recommendations, what is economic more?

G: structure of annual plants is not good for lignin, better is softwood, best is producing aromatics as a starting point.

TILMAN SCHILDHAUER "DIMENSIONS AND OPTIONS OF FLEXIBLE ENERGETIC USE OF BIOMASS"

Questions and Answers:

Jim: infrastructure, how much do we want to pay extra for flexibility (hydrogen grid, stream grid, Co2 or batteries, storage is still the question)?

Tilman: Depends on the different country: hydropower plants in Switzerland, same with batteries; either methane for grid or for liquid- depends on circumstances what you would do.

Jaap: industrial symbiosis- Netherlands hope for this; many industrial activities; how would that interact?

T: perfect match! Biogas or wastewater treatment plants, electric is expensive (hydrogen)- get all synergies as you can. There have to be more spots for this, please tell if you see one!

ESA KURKELA "FLEXCHX - FLEXIBLE COMBINED PRODUCTION OF POWER, HEAT AND TRANSPORT FUELS FROM RENEWABLE ENERGY SOURCES"

Questions and Answers:

Luc: not just seasonal flexible price, how much flexible is biogas using/switching different mode prices?

Esa: Within an hour level, a full change will be possible

Jim: economics is challenging- prices have been low and they pick up soon, politics (palmoel challenging) T39 prospective feedstocks are very limited- everybody wants them to produce things- what is the role of regulation & policy to increase economics

Esa: there are already many papers written in this issue; 1000 Euro/t productions cost- 2x price as normal price; Demo plant might not be economic- so it is still a challenge

Jaap: REDII will help?

Esa: Yes, but not this quick- it is a long process. Nice targets, plenty; takes 5 years to have it in commercial level

Ilkka: biomass is cheaper than hybrid process, if you are interested in Power2X you should look into (Ilkka would you pls. add) paper -LINK???

You need less biomass to produce some level of power

Tilman: oxygen will be on top

Jim: we need policy for this further use of all this an symbiose, integrated thinking

Tillman: Carbon in biomass, 3 ways to end up in different ways

Ilkka: electricity not to increase biomass but to have more carbon saved

Franziska: considering in this project, what is the minimum % of GHG? Did you discuss this?

Esa: Have LCA study to look at this. They use residues- only if they would use forest, it will be a problem. Closing plastic circles are used here as well.

Antti: think that will be a huge part of the discussion related to REDII next winter and spring.

(SUMMARY)

Jack: transportation, in northern regions electrification, finding success stories, find more examples Identify activities for further collaboration. Any kind of examples and success stories.

Jim: Tilman questionnaires??? Maybe post it.

Germany's testbed- we need these types of projects. What is the low hanging fruit in the next steps? IEA members countries, we need to get there.

Ian: agrees, international work on this, so a lot of collaboration for the US- they look and see, how they get more involved; we get there faster together

Dina: electro fuel production- intertask topic in new triennium? Demo test- e Fuels facilities-.

Luc: rather focus on hybrid Ilkka recommend; so much about E-fuels- we have to put this forward.

Jim: hybrid concepts more efficient.

We started a good conversation! How can we help each other and find issue for the next triennium.

Daniela: hybrid success story could be a good (out from the different concepts, we heard of)???

Thanks a lot for all speakers. It was an excellent start.

Presentation will be shared as pdf in the Tasks. All presenters agree!