EX-JOBB

FÖR DIG PÅ KAU SOM VILL JOBBA MED

LIGNOCITY

LignoCity är en världsunik plattform inom miljöteknik med ambitionen att överbrygga från forskning till kommersialisering av hållbara processer och produkter, med specifikt fokus på lignin från skog och mark som råvara. Förslagen på ex-jobb riktar sig till dig som är student på Karlstads universitet, och sker samverkan med LignoCity, Paper Province, Rise och Karlstads universitet. Beskrivningarna är på engelska.

www.paperprovince.com/studenter/ex-jobb

KARLSTADS UNIVERSITET

PAPER PROVINCE

RI. SE

Master Thesis Work:

Biomass to bio-fuels and bio-carbons by use of microwave enhanced pyrolysis

Background & objective

The value chain for lignin feedstock to bio-oils and bio-carbons is focused in this Master Thesis work.

The objective is to clarify/identify the technical and commercial potential to develop a business case, where kraft lignin or kraft lignin mixed with solid biomass (for example saw mill residues) is depolymerized to a biooil (for different purposes where one example is transportation fuel) and a bio-char (bio-carbon) by-product. Consequently, there is a need to identify different potential applications for both the bio-oil and the bio-char (bio-carbon). The depolymerization technology studied in this work is microwave-enhanced catalytic pyrolysis (MWDP) technology developed by Bionic BTL GmbH.

The bio-oil could have many different uses. The bio-oil could for example be hydrogenated to meet public standards for transportation fuel. The value chain summarized, and the best business concept proposed in more detail by a draft technology and commercialization roadmap for industrialization.

The commercial benefit of this technology is two product streams, i.e. bio-oil and char, targeting different market needs and customers. The technology is suitable for medium-sized, perhaps large, operations and will facilitate independent regional bio-economy in regions, potentially rural areas, with resources of lignin, saw dust and forestry residues. This has the potential to strengthen the local economy by local job creation and contribution on a national level to the “green conversion” of bio-oils and potentially transport fuels.

Challenges

- Cost structure for feedstocks, applications and creation of a complete business concept
- The technology which is in a quite early development phase
- Quality of products (bio-oil and bio-char), need for further purification/refining and production capacity
- Identification of funding & entrepreneurial forces
- Market interest – Market pull? Market push?
- A serious technology and commercialization roadmap for industrialization

Project Plan

The thesis work is suitable for one or two master students with excellent background in both technology and economy.

The objective with this master student work is to clarify if it is possible to find a concept with good potential to form a business case in Värmland for a regional or national market. The work will focus use of available information which the master student/-s develop and refine. Limited experimental work can be justified in some cases.

Candidate

As a candidate for this Master Thesis work you should preferably like independent and creative work where you collect a lot of information by different contacts with the established actors in the field. A suitable background is industrial economy, chemistry, chemical technology and analytical chemistry. The work is planned for Q1 and Q2 2019.

Location

The LignoCIty Initiative in Bäckhammar – cooperation with Karlstad University, Paper Province and RISE Bioeconomy.

Contact persons

The LignoCity Initiative:

- Karlstad University: Zane Rowe (zane.rowe@kau.se)
- RISE Bioeconomy in Stockholm: Per Tomani RISE (per.tomani@ri.se)

Operative supervisors will be discussed and decided together with the master student.

---

www.paperprovince.com/studenter/in-dagen-2018

Master Thesis Work:

Markets for & production of lignin-based polyurethanes (PU)

Background & objective

The company Enerlab in Canada has developed possible applications for lignin-based polyurethanes (PU) – 1) Spray Polyurethane Foam (SPF), 2) Polyisocyanurate Insulation Board (PIR) and 3) Structural Insulated Panel (SIP). This master thesis work focus the potential for this type of lignin-based PU:s for the Nordic market.

The objective is to clarify where the market is and who are the actors are today on the PU market in the Nordic countries and EU, the potential for the technology by Enerlab and if there are other actors in "green" PU:s. The demand on production od lignin-based PU:s should be clarified and the information summarized into a road map for commercialization.

Challenges

- A map of todays actors in production and users as well as specific products
- Specifications
- Alternative "green" PU:s
- Cost structure
- Drivers for change into "green" options and well as limitations
- Production demands – what is needed in terms of equipment and infrastructure etc.
- R&D challenges

Project Plan

The objective with this master student work is to clarify if it is possible to find a concept with good potential to form a business case in Värmland for the Nordic (or European) market. The work will focus use of available information which the master student/-s develop and refine. Limited experimental work can be justified in some cases.

Candidate

As a candidate for this Master Thesis work you should preferably like independent and creative work where you collect a lot of information by different contacts with the established actors in the field. A suitable background is industrial economy, chemistry, chemical technology and analytical chemistry. The candidate will need to have interest and skills in both technology, economy and business development. The work is planned for Q1 and Q2 2019.

Location

The LignoCity Initiative in Bäckhammar – cooperation with Karlstad University, Paper Province and RISE Bioeconomy.

Contact persons

The LignoCity Initiative:

- Karlstad University: Zane Rowe (zane.rowe@kau.se)
- RISE Bioeconomy in Stockholm: Per Tomani RISE (per.tomani@ri.se)

Operative supervisors will be discussed and decided together with the master student.

Master Thesis Work:
Upscaling of lignin-based polyesters

Background & objective

Lignin-based polyesters with a biodegradable property is an interesting future product developed by partners in the LignoCity Initiative. When a suitable production method is defined in detail and a business opportunity is secured we need to have larger scale production up running.

This master thesis work will focus the work usually made by consultants to create a first design of a production line. However, we want to take this opportunity to instead form a master thesis work, as a pre-project to a commercial installation. A production line is in this case planned to be built within the LignoCity Initiative in Bäckhammar. The objective is to design the layout of the production line, create and compare different alternatives, make cost calculations and predict the hurdles and advantages/ drawbacks (make a SWOT analysis) for the different options to build such line. It is expected to select the best alternative and in more detail create a decision material from which it is possible to act on an investment.

The scale and more detailed specifications will be defined by the supervisors. The work includes collecting detailed information from many different sources. A lot of different aspects are to be taken into consideration from the foot-print of the upscaling to a detailed plan on how to put the different unit operations together into a production line.

Candidate

As a candidate for this Master Thesis work you should preferably like independent and creative work where you collect a lot of information by different contacts with the established actors in the field. A suitable background is polymer technology or chemical technology with specific interest in equipment used in production where polymers are processed. The work is planned for Q1 and Q2 2019.

Location

The LignoCity Initiative in Bäckhammar – cooperation with Karlstad University, Paper Province and RISE Bioeconomy.

Contact persons

The LignoCity Initiative:

- Karlstad University: Zane Rowe (zane.rowe@kau.se)
- RISE Bioeconomy in Stockholm: Per Tomani RISE (per.tomani@ri.se)

Operative supervisors will be discussed and decided together with the master student.

Master Thesis Work:

Markets for and production of lignin-based flocculants and dispersing agents

Background & objective

The work by Lakehead University in Ontario Canada show interesting results for lignin-based flocculants. This master thesis work will focus the potential for this type of lignin-based flocculants and dispersing agents for the Nordic or European market.

The objective is to clarify where the market is and who are the actors are today on these different markets in the Nordic countries or EU, the potential to establish a production site in Värmland using a defined technology where lignin is modified to a flocculant or dispering agent for a specific market and to identify if there are other actors in the field of "green" flocculants / dispersing agents. The demand on production od lignin-based flocculants/dispersing agents should be clarified and the information summarized into a road map for commercialization.

Challenges

- A map of todays actors in production and users as well as specific products
- Specifications
- Alternative "green" products
- Cost structure
- Drivers for change into "green" options and well as limitations
- Production demands – what is needed in terms of equipment and infrastructure etc.
- R&D challenges

Project Plan

The objective with this master student work is to clarify if it is possible to find a concept with good potential to form a business case in Värmland for the Nordic (or European) market. The work will focus use of available information which the master student/-s develop and refine. Limited experimental work can be justified in some cases.

Candidate

As a candidate for this Master Thesis work you should preferably like independent and creative work where you collect a lot of information by different contacts with the established actors in the field. A suitable background is industrial economy, chemistry, chemical technology and analytical chemistry. The candidate will need to have interest and skills in both technology, economy and business development. The work is planned for Q1 and Q2 2019.

Location

The LignoCity Initiative in Bäckhammar – cooperation with Karlstad University, Paper Province and RISE Bioeconomy.

Contact persons

The LignoCity Initiative:

- Karlstad University: Zane Rowe (zane.rowe@kau.se)
- RISE Bioeconomy in Stockholm: Per Tomani RISE (per.tomani@ri.se)

Operative supervisors will be discussed and decided together with the master student.

Master Thesis Work:

Markets for and production of lignin in asphalt applications

Background & objective

The work by Wageningen University & Wageningen Research show interesting results for lignin-based asphalt. This master thesis work will focus the potential for this type of lignin-based asphalt for the Nordic or European market.

The objective is to clarify where the market is and who are the actors are today on these different markets in the Nordic countries or EU, the potential to establish a production site in Värmland using a defined technology where lignin is modified to a product for asphalt and to identify if there are other actors in the field of "green" solutions in addition to just the easy switch from a fossil to a bio fuel. The demand on production of the lignin-based asphalt as well as the business case should be clarified and the information summarized into a road map for commercialization.

Challenges

- A map of todays actors in production and users as well as specific products
- Specifications
- Alternative "green" products
- Cost structure
- Drivers for change into "green" options and well as limitations
- Production demands – what is needed in terms of equipment and infrastructure etc.
- R&D challenges

Project Plan

The objective with this master student work is to clarify if it is possible to find a concept with good potential to form a business case in Värmland for the Nordic (or European) market. The work will focus use of available information which the master student/-s develop and refine. Limited experimental work can be justified in some cases.

Candidate

As a candidate for this Master Thesis work you should preferably like independent and creative work where you collect a lot of information by different contacts with the established actors in the field. A suitable background is industrial economy or chemical technology. The candidate will need to have interest and skills in both technology, economy and business development. The work is planned for Q1 and Q2 2019.

Location

The LignoCity Initiative in Bäckhammar – cooperation with Karlstad University, Paper Province and RISE Bioeconomy.

Contact persons

The LignoCity Initiative:

- Karlstad University: Zane Rowe (zane.rowe@kau.se)
- RISE Bioeconomy in Stockholm: Per Tomani RISE (per.tomani@ri.se)

Operative supervisors will be discussed and decided together with the master student.