

# Biorefinery Pilot Research, 7.5 hp

PhD Course within the Bio4Energy Graduate School

Bio4Energy is a research environment based in northern Sweden. Its 220 researchers deliver methods and tools for making biofuels, "green" chemicals and bio-based materials. Appointed by the Swedish government as a Strategic Research Environment in bioenergy and biorefinery, it includes researchers from three universities and several of the RISE Research Institutes of Sweden. Umeå University, Luleå University of Technology and the Swedish University of Agricultural Sciences at Umeå are academic members, working in collaboration with RISE Energy Technology Center, RISE Processum and a part of RISE Innventia. The research environment includes an industrial network of 21 founding members.



BIO4ENERGY

This is an invitation to participate in the Biorefinery Pilot Research course hosted by the Bio4Energy Graduate School in collaboration with RISE Energy Technology Center (ETC) and RISE PROCESSUM within RISE Bioeconomy. The course consists of three parts, where part 1 starts August 27<sup>th</sup> 2018. The course is suited for people interested in the future of biorefineries, especially students at doctoral and postdoctoral levels, as well as people from industry who want to increase their knowledge and insight into the innovation chain.

## Objectives

The course will provide:

- A technical overview of the biorefinery technologies represented in the pilot/demonstration scale facilities within the Bio4Energy environment.
- Insight into various approaches for physical upscaling of research facilities and examples of challenges and benefits when performing research in large-scale facilities.
- Understanding of the societal landscape for taking biorefinery research to implementation.
- Access to interdisciplinary exchange through networking activities with the participants.

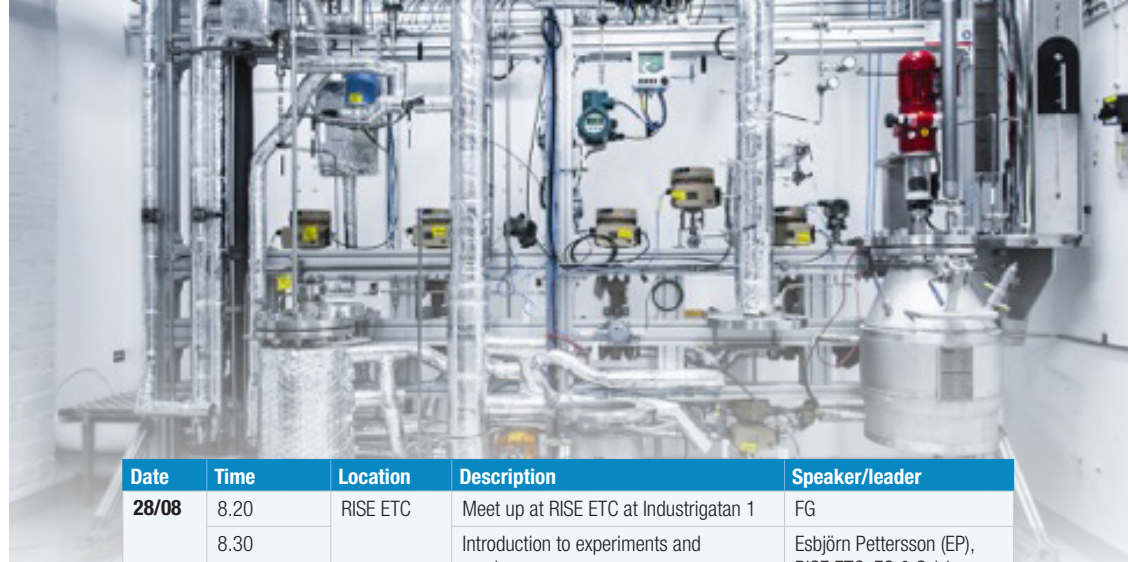
## Contents

- On-site at pilot and demonstration facilities: Demonstrations, lectures and interactive seminars.
- Biorefinery pilot and demonstration R&D – National and international outlook, concepts of technical innovation system, knowledge and skills of importance issues in pilot and demonstration R&D: Lectures, literature and interactive seminars.
- Technology upscaling within your own research field: Group/individual work to describe, compare, and discuss the current state-of-the-art (approaches, bottlenecks, actor constellations, etc.) – Written report and examination seminar.

## Preliminary program and dates

### Part 1, Piteå August 27<sup>th</sup> -29<sup>th</sup> 2018

Date	Time	Location	Description	Speaker/leader
<b>PITEÅ 27/08</b>	11.30	Pite Havsbad	Gathering and checking in	Francesco Gentili (FG), SLU
	12.00		<i>Lunch</i>	
	13.00		Welcome and Introduction	FG
	14.00		Introduction to innovation system roles	Hans Hellsmark (HH), Chalmers
	14.20		Innovation system roles – group seminar + <i>Coffee</i>	FG & HH
	15.40		Introduction to Technical Innovation Systems (TIS) and the strategic value of pilot and demonstration plants	HH
	16.30-17.00		Introduction to Pilot project assignment	FG & HH
	17.30		<i>Dinner at Skeppet</i>	
	18.30-20.00		<i>Swimming at the adventure pool</i>	



Date	Time	Location	Description	Speaker/leader
<b>28/08</b>	8.20	RISE ETC	Meet up at RISE ETC at Industrigatan 1	FG
	8.30		Introduction to experiments and seminars	Esbjörn Pettersson (EP), RISE ETC, FG & Sylvia Larsson (SL), SLU
	9.00		RISE ETC block 1 (2+2 groups for seminar and experiments)	
	13.00		<i>Buffé lunch and networking</i>	RISE ETC
	14.00		RISE ETC block 2 (2+2 groups for seminar and experiments)	RISE ETC
	18.00		Summary	EP & FG
	19.00		<i>Dinner at RISE ETC</i>	
	21.00		<i>Transportation to Pite Havsbad</i>	

29/08	8.20	ETC	Meet up at RISE ETC at Industrigatan 1	FG
	8.30		Inspiration lecture part I	Ingvar Landälv (IL), LTU
	9.30		<i>Coffee and networking (prel. Poster viewing RISE ETC &amp; LTU)</i>	
	10.00		Inspiration lecture part 2	IL
	11.00		ETC-LTU GF site introduction	EP & Fredrik Granberg, LTU
	12.00		<i>Lunch Smurfit Kappa Kraftliner</i>	
	13.00-13.45		Summary of Piteå gathering	FG

### Part 2: September 17<sup>th</sup> -21<sup>th</sup> Örnsköldsvik - Umeå.

The Swedish northern coastal area with the cities of Piteå, Umeå and Örnsköldsvik offers a unique opportunity to visit several different pilot facilities. In the second part we will visit and gain experiences regarding the potentials and challenges of the pilot park of RISE Processum (Örnsköldsvik), the biomass torrefaction pilot and the algae pilot (Umeå).

### Part 3: October 22<sup>th</sup> -23<sup>th</sup> Umeå; Final seminar and presentation

This will be the final event where all the course participants present their study cases about the pilots visited or their own initiative of a potential pilot of interest for the course participant.



## Course fee and accommodation

The course fee is 5000 SEK for academic participants not member of Bio4Energy and 10 000 SEK for participants from the industry. The course fee includes all course materials, social events, amenities, meals and accommodation.

## Registration

Registration should be done no later than 7<sup>th</sup> of August 2018 using the registration form available on the Bio4Energy website (<http://www.bio4energy.se/education/bio4energy-graduate-school.html>).

## Contacts

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