**VIPP** VALUES CREATED IN
FIBRE-BASED PROCESSES
AND PRODUCTS

# THE VIPP NEWSLETTER #6

APRIL 2014

## A PARADIGM SHIFT

There is an ongoing paradigm shift in the Forest industry, in Sweden as well as across Europe. How to produce the raw materials, how to develop new products for new purposes and how to be more energy efficient, more sustainable – with maintained or improved profitability? The key word is bioeconomy. This is also the theme for the Spring Meeting 2014, kindly hosted by Akzo Nobel Pulp and Performance Chemicals AB.

The concept for Vipp Industrial Graduate School connects well to bioeconomy. Raw materials, products and processes are undergoing research and development to meet the new demands. Customer requirements are met by adding value to the traditional products, reaching new markets such as plastics, pharmaceuticals and biofuel. The interdisciplinary approach at Vipp combines research in chemical engineering, energy and environment with service management and innovation. All of them areas which are vital to the future success for companies in this highly competitive line of business.

Vipp Industrial Graduate School has now been extended, enabled by the Knowledge foundation and partner companies. This means another four doctoral students and a prolonged project time to 2019. The success of application to the Knowledge foundation is the result of all the good work from the many involved in Vipp; partners, researchers and co-workers.

Professor Lars Järnström
*Program Director of*
*VIPP Industrial Graduate School*

***VIPP stands for Values created in fibre-based processes and products and is an interdisciplinary industrial graduate school located at Karlstad University.***

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KK-stiftelsen

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# VIPP INDUSTRIAL GRADUATE SCHOOL EXPANDS

Vipp Industrial Graduate School will be extended to year 2019 and another four doctoral students will start their dissertation projects shortly. Vipp+ has been made possible through further funding from the Knowledge foundation together with four companies. Vipp now includes 18 doctoral students and have a total budget of 85 million SEK during 2011-2019, including grant from the Knowledge foundation, contribution from participating companies and Karlstad University's own funding.

The holistic approach of Vipp connects well to changes in the industry today. The forest industry companies in Sweden are in a process of making production processes more efficient, which involve development of more lean and environmentally friendly processes.

– We see a paradigm shift in the forest industry, in Sweden as well as across Europe. Bio economy is in the spotlight and requires a holistic view as well as a focus on value added processes. The current trends are consistent with the interdisciplinary approach taken by Vipp. The doctoral students have a task to reflect upon their own research from a process-, environmental and service perspective, says Lars Järnström, Director of Vipp.

The pulp and paper industry is also developing products for the future markets, including products from wood other than traditional papers. The lingo cellulosic materials production line represents a versatile source for different products and raw materials. The production of different biofuels from wood products and forest production lines, as main product or as side products are expected to increase in the future as well.

– Further research is required, both when it comes to the processes and the development of business models. We will enhance our focus on the service research perspective with a stronger impact of service-oriented research in the new Vipp plus, says Lars Järnström.

The Knowledge foundation has granted 6 million SEK to the expansion of Vipp. The companies taking part in the expansion are contributing with approx. 8 million SEK (in-kind or cash). The new companies joining Vipp are Härjedalens Miljöbränsle AB and SP Technical Research Institute of Sweden, with one doctoral student each. The other two new doctoral students will be working with Pöyry Sweden and Stora Enso.

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VIPP EXPANDS: NEW DOCTORAL STUDENT - DAVID JOELSSON

# STRENGTHENING THE TRANSFORMATIVE CAPACITY OF THE PULP AND PAPER INDUSTRY BY SEEKING NEW WAYS OF PRODUCING, TRANSFERRING AND ASSESSING KNOWLEDGE

Strengthening the transformative capacity of the pulp and paper industry by seeking new ways of producing, transferring and assessing knowledge" is the working title for my project. The focus is on service innovation and business models for the forest industry. My research environment will be at the Service Research Center at Karlstad University.

My background is somewhat varied, with an engineering exam and a master's exam in business and design. My doctoral studies will be in business administration, a new experience after viewing myself more as a designer.

During recent years I have been a consultant in service design, developing business models and innovation processes. I see design as both a process and an approach that is suitable for all kinds of innovation. Now I really look forward to my doctoral studies and where they will take me.

Photo: Linda Fridberg

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| Name: | **David Joelsson** |
| Project start: | **During 2014** |
| Supervisors KAU: | **Martin Löfgren and Per Kristensson** |

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VIPP EXPANDS: NEW DOCTORAL STUDENT - HELENA JOHANSSON CIDER

# INCREASED PRODUCTION OF WOOD PELLETS WITH A SIMULTANEOUS DECREASE IN ENERGY USE THROUGH INVESTIGATION AND REDUCTION OF CLOGGING IN THE DRYING SYSTEM

Wood pellets are a renewable fuel, mainly produced from waste material from the wood industry. An increased production of wood pellets makes society less dependent on fossil fuels. This makes it an important fuel in an environmentally sustainable energy system.

This project is carried out in cooperation with Härjedalens Miljöbränsle AB, HMAB, a large pellet manufacturing plant located outside Sveg in Härjedalen, Sweden. Their production is currently reduced due to problems with their sawdust drying process. Clogging in the drying equipment causes stoppages, where the equipment must be taken apart and cleaned. The cleaning is both time and energy consuming. The purpose of the project is to find the causes behind the clogging and minimizing the clogging problems in the drying process, thereby increasing the productivity.

Part of the study will be carried out by mathematical methods. Statistical modeling will be used for examining process data and multiphysics modeling will be used for deepening the understanding of the drying process and the circumstances under which clogging occurs. An investigation will also be made for finding out what substance in wood becomes sticky and causes the clogging.

My background is a Master of Science in Engineering Physics at Karlstad University, and I graduated in 2008. Since graduation I have been working mainly with modelling and simulation in different fields. For the past two years, I have been employed by Karlstad University as a junior lecturer in environmental and energy systems. I look forward to starting my research and the more I read about the field I will be studying, the more interesting opportunities I see.

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| Name: | **Helena Johansson Cider** |
| Project start: | **During 2014** |
| Supervisors KAU: | **Roger Renström, Jonas Berghel and Lars Nilsson** |

HMAB
HÄRJEDALENS MILJÖBRÄNSLE AB

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VIPP EXPANDS: NEW DOCTORAL STUDENT - JONAS KIHLMAN

# SYSTEMS ANALYSIS OF MULTI-PRODUCT PULP MILLS

The tentative title of this project is “Systems analysis of multi-product pulp mills” and the aim is to find new aspects on how to use wood raw material in a more effective way. Traditional pulping strategies aiming for a single product is in the future likely to be challenged by multi product strategies where simultaneous production of pulp, fuels and chemicals are targeted. In the planned project, different established and novel fiber line process configurations and operational parameters will be examined and analyzed in a context of total value maximization from the wood raw material. Potential trade-offs between fiber yield/properties, energy/chemical consumption and value of achievable side products will be examined. Most important is to increase the knowledge in this area and to discover new strategies which can create an interest at the pulp and paper mills.

I have a Master of Science in Chemical Engineering with a focus on pulp and paper. I graduated from Karlstad University in the beginning of 2006 after completing my thesis at Pöyry. Since then, I have worked at Pöyry as a process engineer with a great variety of assignments, mainly in pulp- and paper industry but also in the field of energy and biofuels.

I look forward to my doctoral studies and I am eager to get started. I see it as an opportunity and a challenge to further explore this interesting field. The graduate school offers me an opportunity to develop my skills further and reach enhanced skills in an area which add to my previous knowledge and experience.

Photo: Marcus Jonsson, Pöyry

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| Name: | **Jonas Kihlman** |
| Project start: | **During 2014** |
| Supervisors KAU: | **Ulf Germgård, Per Kristensson and Lars Nilsson** |

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# JUST A MOMENT, MARTIN LÖFGREN...

**...associate professor in Business administration and researcher at the Service Research Centre. You run the course Service Management in Vipp Industrial Graduate School. Why is this a useful course for doctoral students mainly focused on industry?**
– In this course we give different perspectives on value creation and innovations from a service perspective. We know from previous courses and research that those areas are very fruitful for all industries.

**How will the doctoral students benefit from the course?**
– I hope that they will be given new perspectives on their different research topics and that those perspectives add values to their dissertations.

**How would you describe Swedish industry today in regards to Service management?**
– Swedish industry is very open minded regarding service management and CTF has a long tradition of working together with manufacturing companies. We collaborate both with regional SME:s and multi-national companies like Ericsson, IKEA, and Volvo. The current economy is to a large extent, both nationally and internationally, driven by services. This makes service management a key management process across all industries.

**KAU.SE/EN/VIPP**

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