VIPP INDUSTRIAL GRADUATE SCHOOL
A PARTNERSHIP OF 14 COMPANIES IN THE PAPER AND PULP INDUSTRY AND KARLSTAD UNIVERSITY

VIPP stands for values created in fibre based processes and products and is a unique partnership in Swedish higher education. This is a long-term project financed by the Knowledge Foundation and the partner companies. The partnership was launched in 2011 and presently 18 doctoral students are busy with as many research projects. Three strong industrial graduate school environments:

• pulp, paper and graphic technology
• environment and energy
• service innovation and customer satisfaction

Here the disciplines of chemistry, chemical engineering, environmental and energy systems, physics, mechanical and materials engineering and the Service Research Center (CTF) at Karlstad University are collaborating.

The doctoral students share their time between Karlstad University and their respective company. Their academic supervisors and industrial mentors participate actively throughout the whole process.

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ABOUT KARLSTAD UNIVERSITY
As one of the youngest universities in Sweden, we hope to be more adventurous in challenging the established and exploring the unknown.

Our ambition is to contribute to the development of knowledge at international, regional and individual levels. Thanks to our openness, creativity and multidisciplinary, we have already attained a significant level of academic achievement. All our education and research is underpinned by a close dialogue with private companies and public organizations.

16 000 students and 1 200 employees make the University an inspiring place to work and study. We offer approximately 40 Bachelor’s degree programs, 30 Master’s level degree programs and 900 courses in the humanities and fine arts, social and economic sciences, natural sciences, engineering and technology, health care and teacher training.
ADDED VALUE FROM BIOMASS BY BROADER UTILIZATION OF FUELS AND CHP PLANTS

DOCTORAL THESIS
DECEMBER 08, 2016

ABSTRACT
Bioeconomy has been identified to hold a great potential for reducing fossil fuel dependence and for maintaining and creating economic growth. Large parts of the combined heat and power (CHP) sector, which successfully have contributed in the transition towards a fossil free society, are at present facing stagnation. District heating actors are facing challenges due to warmer climate, better insulated buildings and competition from heat pumps. The forest industry where CHP plants supplies processes with heat is facing structural changes foremost in the graphic segments.

The emerging bioeconomy and the stagnation for the existing business models in large parts of the CHP sector form the background for the examination of additional value-creating processes in the existing CHP structure presented in this thesis. The technical viability for integration of fast pyrolysis, gasification and leaching with existing CHP plants has been analysed as well as the motivation and ability of the CHP incumbents to participate in a transition towards the bioeconomy by developing their plants to biorefineries.

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BIography
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LIST OF PUBLICATIONS

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Other work by the author