

7th International Congress on

BIOFUELS AND BIOENERGY

October 02-04, 2017 Toronto, Canada

Commercializing the bio-based economy: Pilot and demonstration plants in innovation management and policy

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Pilot and demonstration plants (PDPs) play important roles in the process of technological development, particularly in the so-called formative phase of technological development, which is characterized by long development periods, substantial uncertainties and small volumes of production. Moreover, in this phase the actor networks are not well-developed and need to be formed and aligned with institutions and technology, making the understanding and management of the actor networks key. The PDPs represent key bridges between basic knowledge generation and technological breakthroughs on the one hand and industrial application and commercial adoption on the other. This is especially valid for capital intensive processes/technologies such as the advanced bio-refinery technologies. Today, demonstration activities are increasingly emphasized in different policy initiatives, including NER 300, Horizon 2020 etc. Still, in spite of the high policy relevance of PDPs, the knowledge gap in this field is substantial. There exists an extensive research on the growth of technological innovation systems, their dynamics and implications for policy design. Very few studies, though, explicitly address the value of PD plants from an innovation policy viewpoint. This presentation will present highlights from an ongoing 5-year research project aimed at addressing two over-arching research questions: (1) How can the societal benefits of PDPs be understood and evaluated? And (2) How can the PDP activities be organized and supported to maximize these benefits (e.g., funding, ownership etc.)? The research addresses the actor networks surrounding important bio-refinery-related plants in Sweden and their role in knowledge generation enabling technology up-scaling and diffusion.

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