



Holistic processes and practices for clean energy in strengthening bioeconomic strategies (INDO-NORDEN)

The EU and India share common objectives in enhancing energy security, promoting energy efficiency and energy safety, and the pursuit of sustainable development of clean and renewable energy source. The EU's Renewable Energy Directive has set a binding target of at least 27% final energy consumption from renewable sources by 2030. Therefore, EU countries have committed to reaching their own national renewable targets. India, on the other hand, is emerging as one of the fastest growing countries in the world. Energy being the driver of this growth, its availability is of great importance to sustain a high level of growth. It is projected that the energy demand in India will be three to four times higher than the current level in the next 25 years. Bio-based energy (produced from biomass and waste) is of particular interest for all of our consortium partners in meeting the common objective of replacing or complementing fossil fuels in the transport sector and in power (and heat) generation.

Finland (Dr. Narasinha Shurpali, University of Eastern Finland (UEF), Kuopio) will coordinate the INDO-NORDEN project. Finland will contribute to the project in a two-fold approach – solid biomass and biogas production from farm waste and plant biomass. Forestry in Finland has a major share in the national GDP. Owing to Finland's bold bioeconomy plans, forestry sector is under pressure to intensify its contribution to the bioenergy supply. However, we do not yet clearly understand how forestry intensification practices will affect our environment. We plan to measure greenhouse gas (GHG) exchange from clear-cut and stump harvested forest sites with an intact forest stand as the benchmark site. In addition, we will conduct a field experiment near Maaninka Research Station, Luke, wherein we will cultivate red clover (puna-apila) and measure seasonal and annual GHG exchange from the cultivation system. We will use a part of the harvested crop as a substrate with farm waste from the Maaninka research station for biogas production. We expect that such a mixture will produce more biogas for use in district heating and electricity. With the participation of a biogas company in the project, we will disseminate our research findings to biogas industry and other stakeholders. Our Indian and Estonian partners will improve processes of extracting biobutenol/bioethanol from agricultural residues (rice and sugarcane straws in India and rye and barley straws in Estonia). This work will add value to the project by highlighting processes to increase the biofuel yield. Fine particle emission laboratory located at UEF will assess the effects of biomass raw material on ash characteristics and behavior as well as on the fine particle and gas emissions in biomass-fired combustion plants.

Project partners:

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