



Sustainability Impact Assessment of Alternative Small- and Medium-/Large-Scale Bio-energy Chains

Background:

Changing forest management practices towards more intensive biomass utilization for energy purposes will affect the sustainability of the resource management. In Northern Europe wood has always played an important role in terms of energy supply. New policy targets on increased shares of renewable energy create challenges in connection to economic, environmental and social sustainability of Forest Wood Chains.

The Northern Periphery Programme project Northern ToSIA (2008–2011 – www.northerntosia.org) aims at applying ToSIA in a real-world setting to different regional cases, including a multi-stakeholder approach in order to enhance communication and to provide decision support on e.g. regional sustainability development issues.

Regional Example:

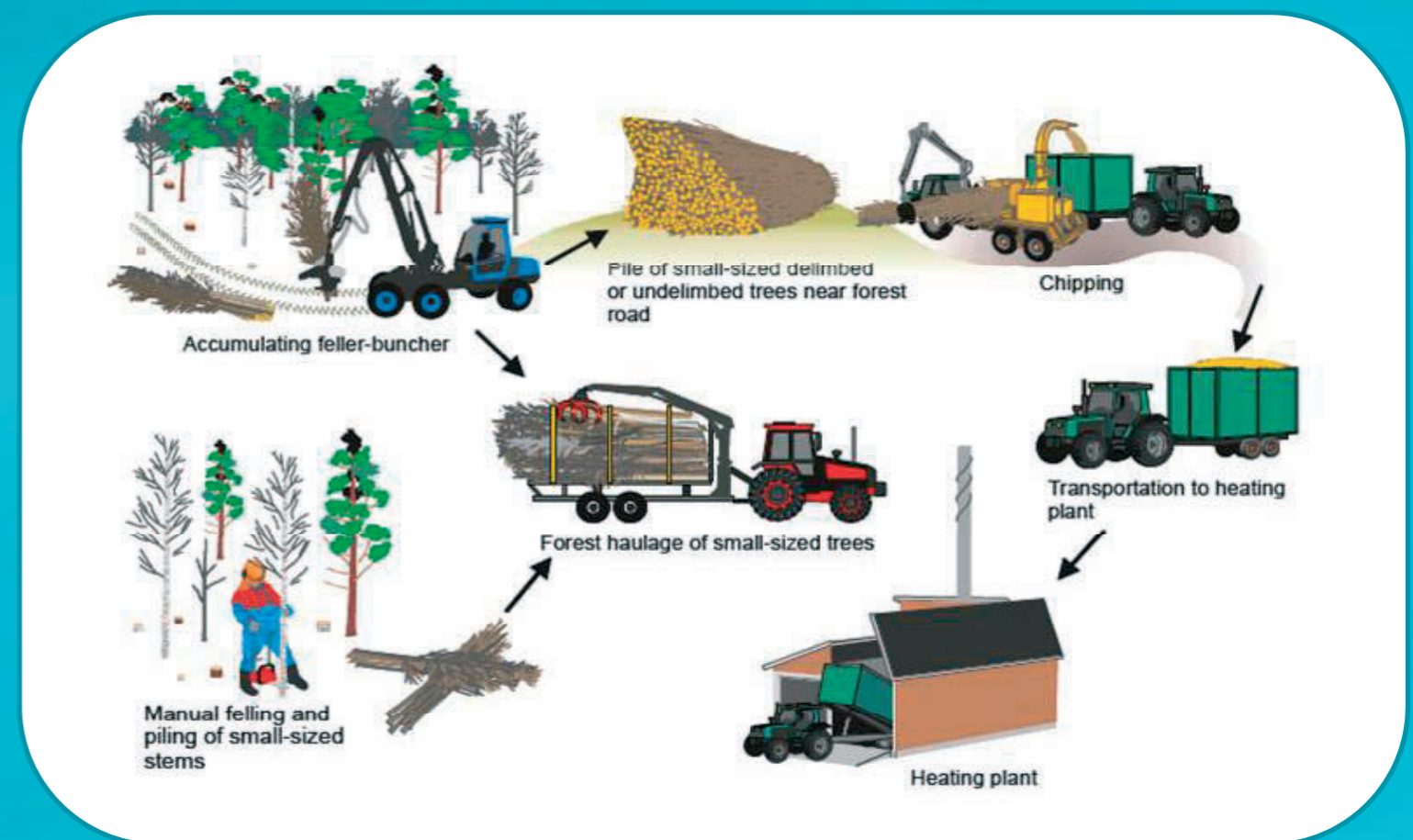
In the framework of the North Karelia Bioenergy Programme, a 2.6-times increased use of forest wood chip from year 2004 to 2010 is desired. By which means this goal can be reached and how different implementations (small/- to medium-/large-scale applications) affect the region, is a central question.

In an example for the region of North Karelia the implementation of small-scale versus medium- to large-scale forest biomass use in district heating plants will be investigated

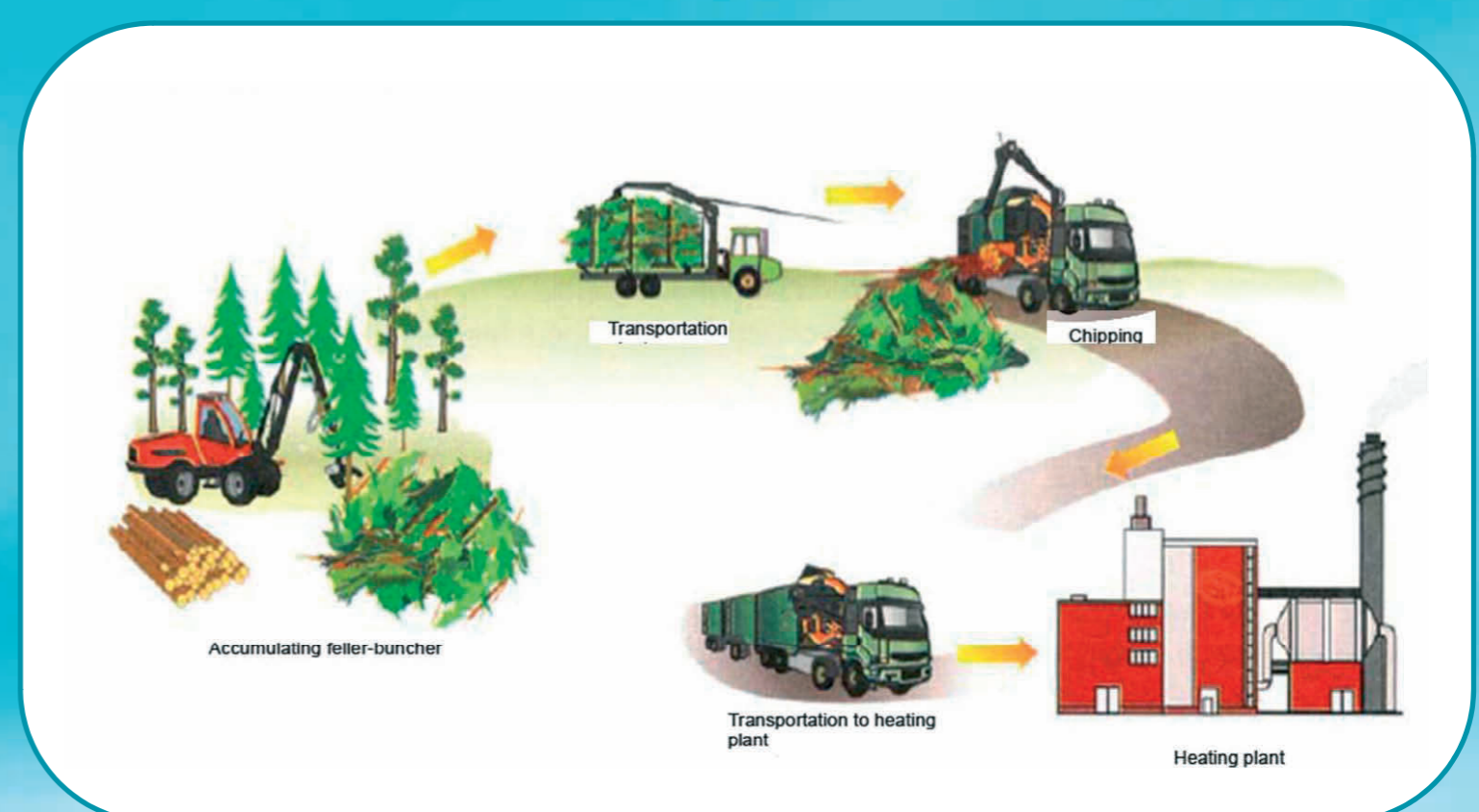
The primary focus will be not only on the environmental issue of providing green energy, but also on the social and economic dimension of the Local Value Added by those different mill sizes to the local community in terms of return on investment, securing additional employment, enhancing quality of life, and strengthening rural development.

The tool:

Northern ToSIA will apply the Tool for Sustainability Impact Assessment (ToSIA) to evaluate the environmental, social, and economic sustainability of typical Scandinavian bio-energy value chains.



Small-scale forest biomass use in Tuupovaara district heating plant (0.6 MW)



Medium-scale forest biomass use in Outokumpu district heating plant (10 MW)

Kallio M. and Leinonen A. 2005. Production Technology of Forest Chips in Finland. Project report. PROJ/P2032/05. VTT Processes.

Expected results:

Sustainability indicator impacts are calculated with ToSIA in relation to the material flow through production processes in the alternative bio-energy chains.

Effects on the rural society and ecosystems will be assessed in terms of the following sustainability aspects:

- Economic (e.g. production costs, local value added)
- Social (e.g. employment, wages, occupational safety, income to local forest owners)
- Environmental (e.g. energy use, greenhouse gas emission, carbon sequestration, biodiversity, transport distance)