

Northern ToSIA

Assessing sustainability of forest based activities in rural areas of the Northern Periphery

Case study in Finland, North Karelia

Review in March 2010

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The ToSIA approach – Case North Karelia

Use of forest wood chips for heat production

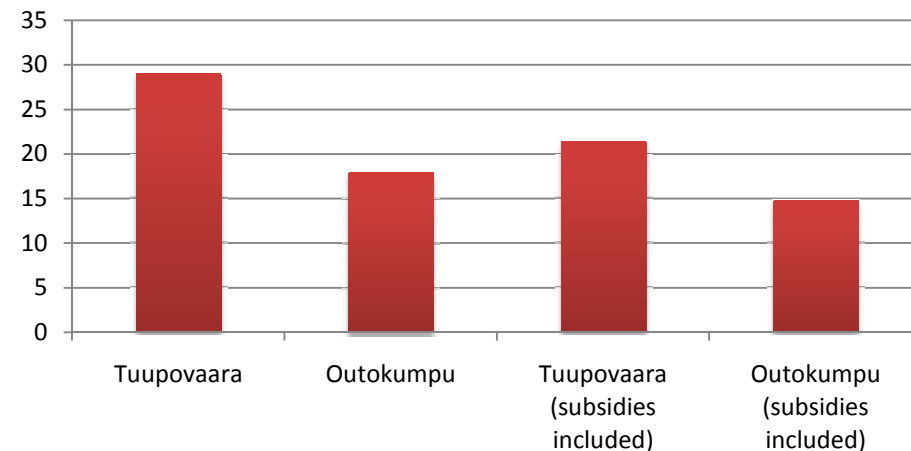
- Sustainability impact assessment of forest-wood-chains in centralized and distributed forest bioenergy utilization
- Two example cases of forest bioenergy utilization in heating plants
 - Tuupovaara Energy Co-operative (small-scale)
 - Outokumpu Energy Oy (medium scale)
- **The first results have been presented in February 2010**

Result: Economic indicator Energywood procurement costs

- Tuupovaara (small scale): 28,97 €/MWh - 21,41 €/MWh
 - Outokumpu (medium scale): 18,03 €/MWh - 14,77 €/MWh
- Relative difference:
- Without subsidies: **-38 %**
 - With subsidies: **-31 %**

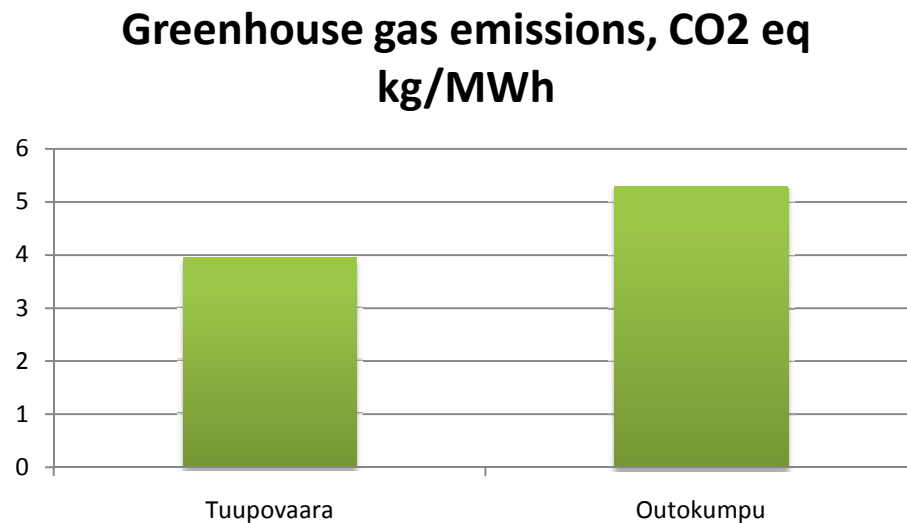


Production costs, €/MWh



Result: Ecological indicator Green house gases (GHG) emissions from the machinery

- Tuupovaara (small scale): 3,94 kg CO₂ eq/MWh
 - Outokumpu (medium scale): 5,33 kg CO₂ eq/MWh
- Relative difference: **35 %**

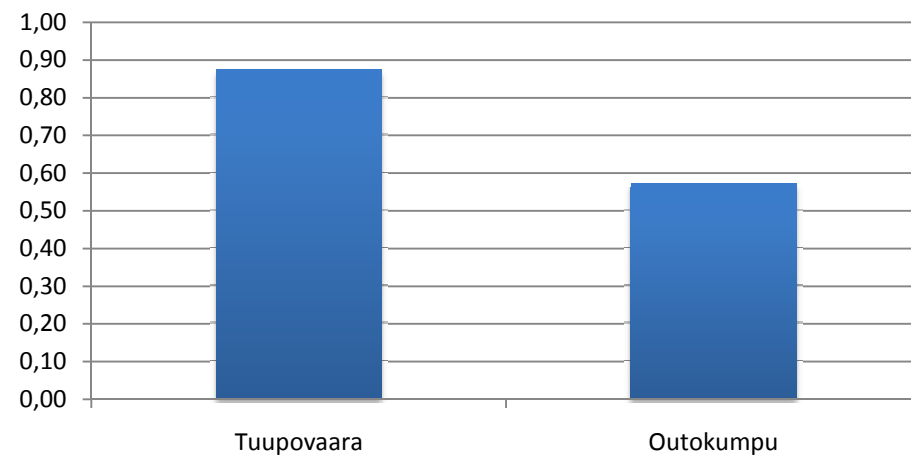


Result: Social indicator Employment

- Tuupovaara (small scale): 0,87 person years/1000 MWh
 - Outokumpu (medium scale): 0,57 person years/1000 MWh
- Relative difference: **-35 %**



Employment, person a/1000 MWh



Some comparative statements on results

- Economic impacts:
Medium scale: Mechanized harvesting, efficient machinery → Savings in costs
Small scale: Subsidies important in small scale utilization
- Ecological impacts:
Medium scale: Heavier and bigger machinery → Increased fuel consumption
→ increased GHG emissions
- Social impacts:
Small scale: Manual harvesting methods → Increased employment effect

Upcoming activities

- Extend analysis of heating plants
 - more indicators
 - scenarios
- Seeking possibilities to use ToSIA in regional development
 - Climate and Energy Programme for North Karelia
 - Regional Forestry Programme of North Karelia

