

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

Marja Kolström and Matias Pekkanen, EFI

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**

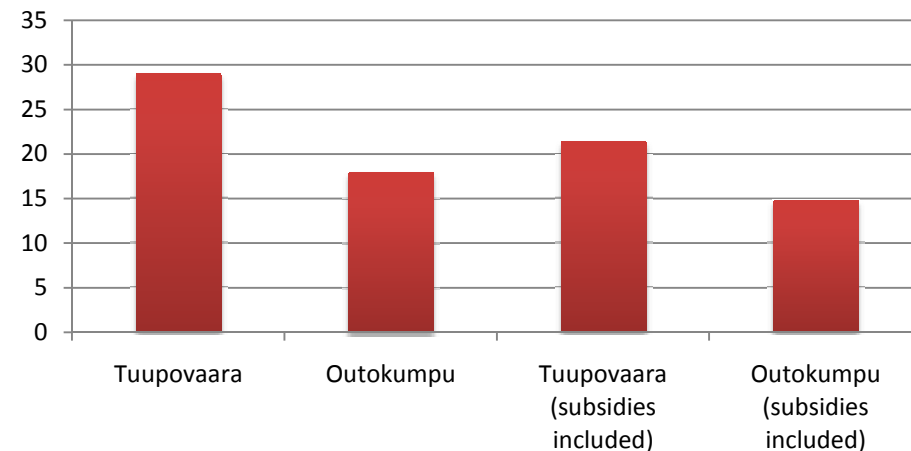
Result: Economic indicator

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 %**

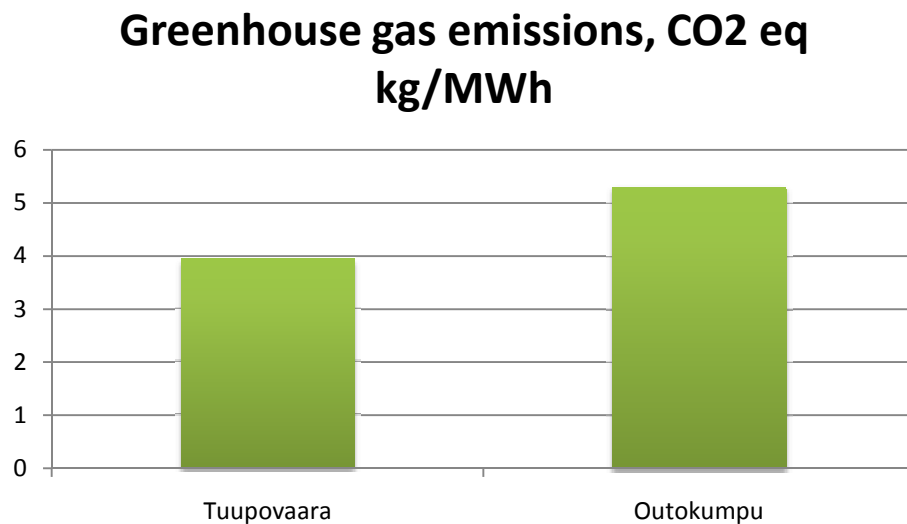


Production costs, €/MWh



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 %**

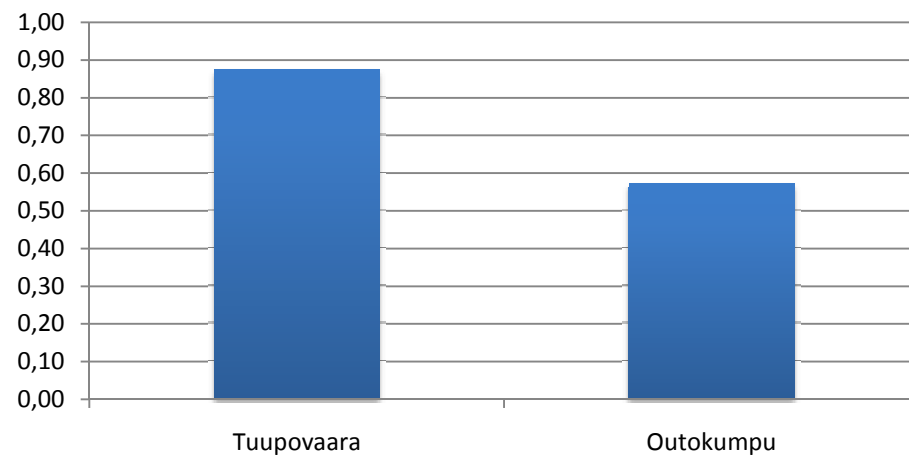


Result: Social indicator Employment

- 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

