Integrated roundwood and biomass terminals – 0.1 TWh case

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Background

• The idea of the integrated terminal comes from the need to utilize a terminal area in a central traffic location such a way that it serves both roundwood and biomass storing and refining needs.

• Another benefits of integrated terminal are effective terminal area use and integrated machine utilization.

• The aim of this study was to estimate the cost saving potential of 0.1 MWh integrated terminal.
Operating models for terminal area

Materials have own terminals

Roundwood

Energywood

Materials have fixed areas in terminal

Roundwood

Energywood

Materials have changing areas in terminal

Roundwood 0-100 %

Energywood 0-100 %
Integrated terminal - case 0.1 TWh

- The main function of the terminal is to serve biomass storing and refining needs and the excess area is for roundwood storing.
- Annual rotation of biomass is 0.1 TWh = 50 400 sob-m$^3$ and 50 400 sob-m$^3$ of roundwood.
Integrated terminal - case 0.1 TWh

Monthly incoming and outgoing material in large and small cycles.
In annual rotation, minimum surface area requirement for integrated terminal was 2.9 ha in September.
Utilization rate of the terminal area

- 100 % utilization rate in September.
Costs of integrated terminal

• Infra costs 1.2 €/m³.

• Material handling costs 4.2 €/m³.

• Total costs 5.4 €/m³.

• If there would be separate terminals for roundwood and biomass, the unit cost would be 6.3 €/m³.

• Cost savings 14.3 % in integrated terminal.
Conclusions

• There are possibilities to achieve cost savings in integrated terminals.
• The operation of integrated terminal requires efficient and well-managed logistics as well as active management of the terminal field.
• The integrated terminal requires finding a suitable area where all refining actions can be performed.
  – Thus, all bioenergy terminals are basically potential integrated terminals.
• Loading points for HCT-trucks.
• Other possible benefits are achieved through roundtrip loads. For example, importing a load of energy wood to the terminal and exporting a load of roundwood.
• An integrated terminals could store also chips for energy and ash.
Project

- This study was part of the project *Terminal Operations in Energy Efficient Timber Logistics* [http://www.metsateho.fi/terminaali/](http://www.metsateho.fi/terminaali/)
- Project leader senior researcher Pirjo Venäläinen from Metsäteho
Literature

