Metsäteho

Integrated roundwood and biomass terminals – 0.1 TWh case

Heikki Ovaskainen
Metsäteho

NOFOBE and NB-NORD Meeting
14–16 June 2017
Lappeenranta, Finland

Contents

- Aim of the study
- Operating models for integrated terminal
- Material cycle
- Costs of 0.1 MWh terminal
- Conclusions

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.**

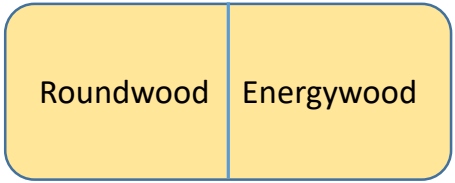
Operating models for terminal area

Materials have own terminals

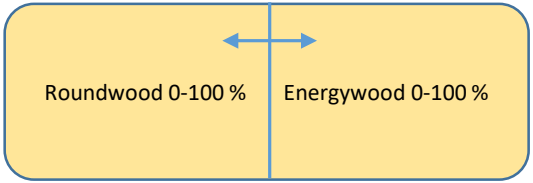
Roundwood

Energywood

Materials have fixed areas in terminal

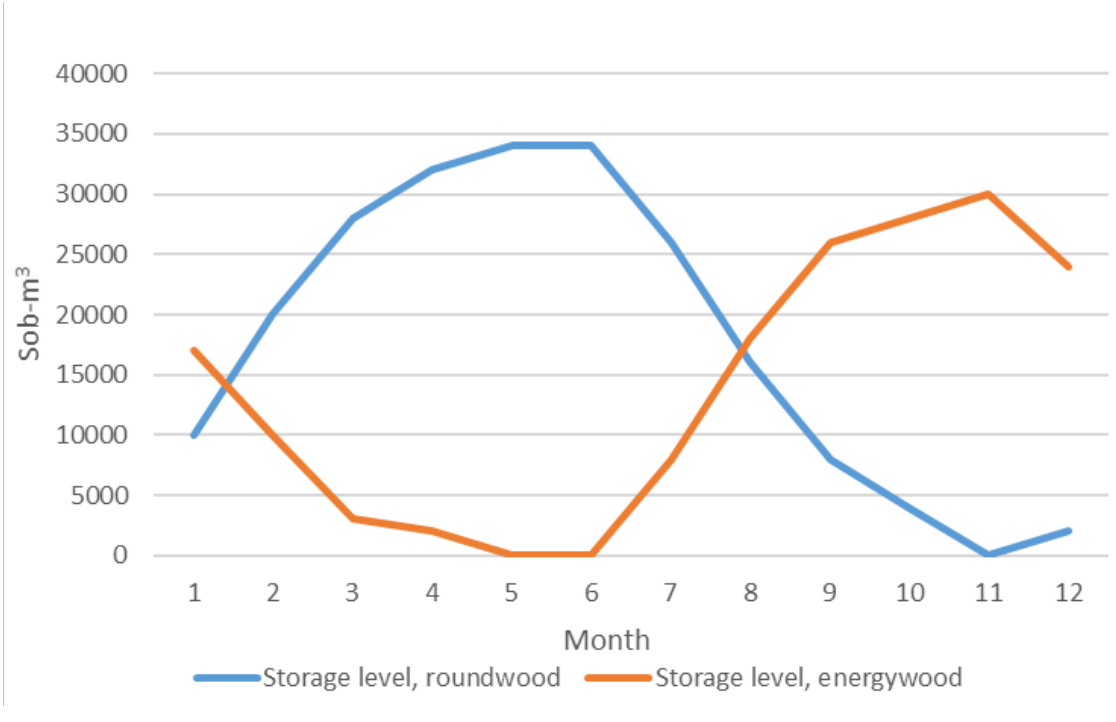


Materials have changing areas in terminal

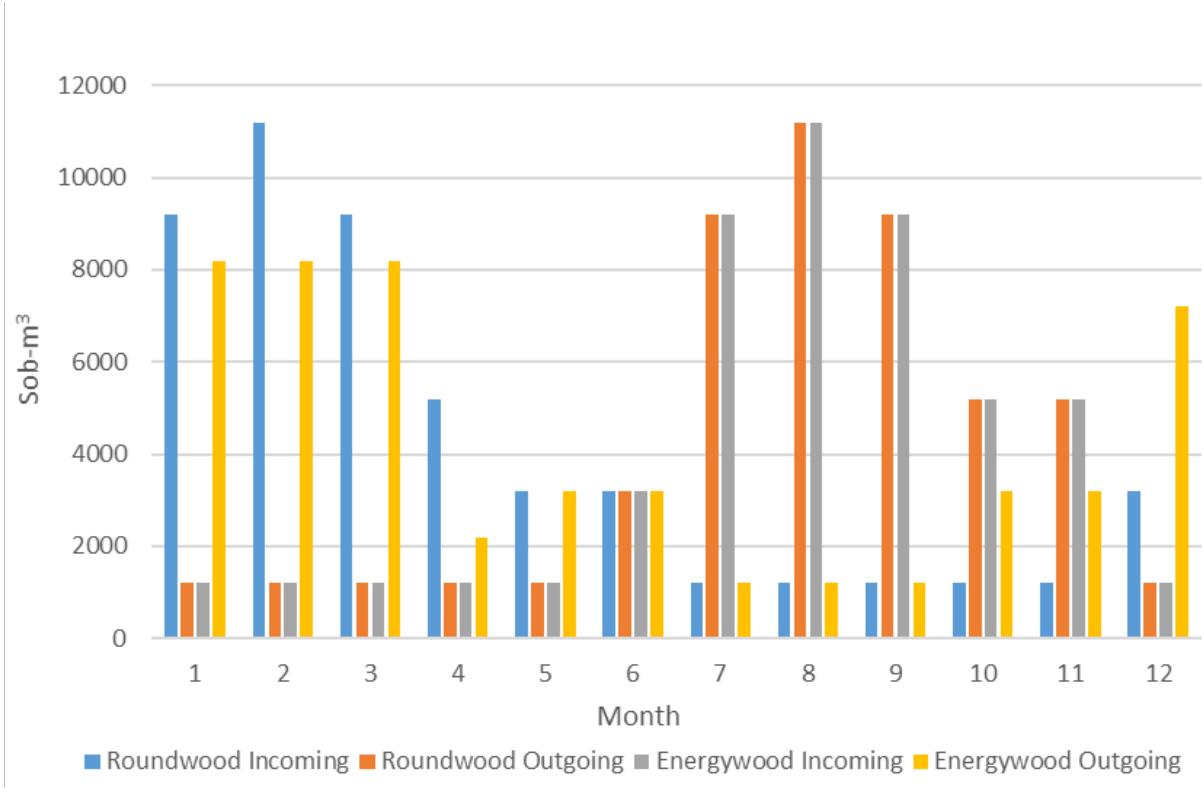


Integrated terminal - case 0.1 TWh

- 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.

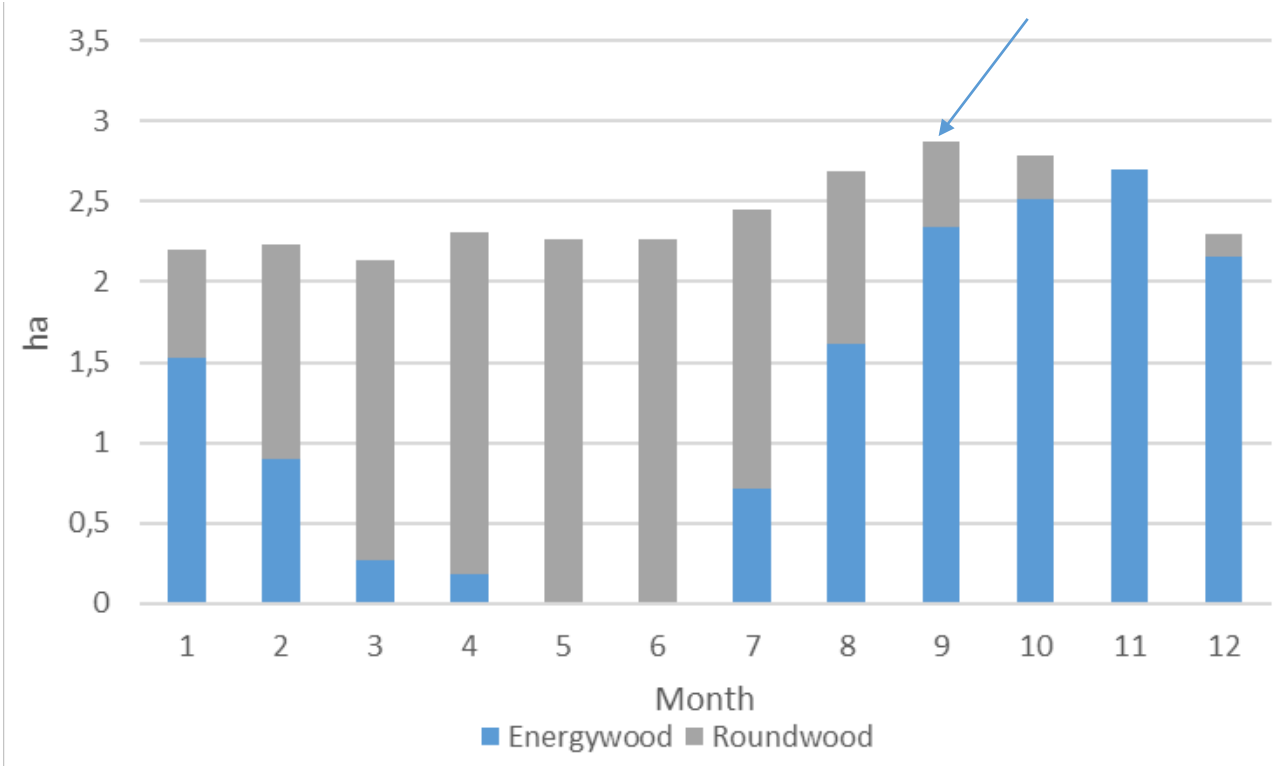


Integrated terminal - case 0.1 TWh



Monthly incoming and outgoing material in large and small cycles.

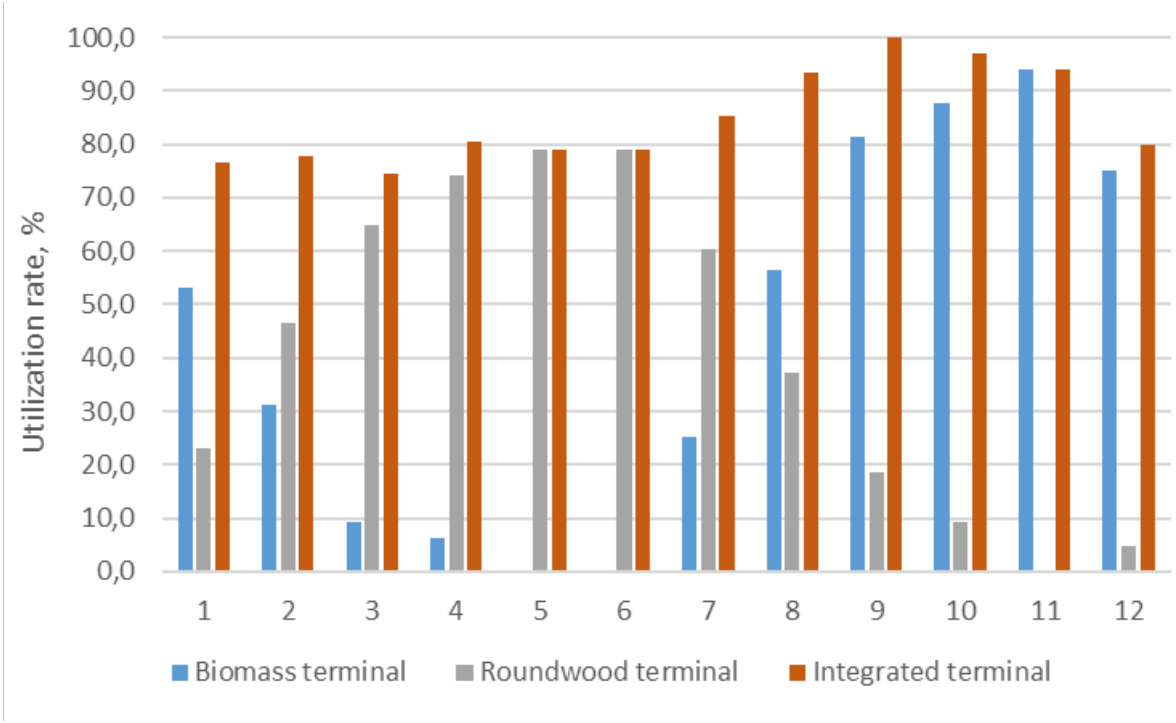
Integrated terminal - case 0.1 TWh



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/
- Project leader senior researcher Pirjo Venäläinen from Metsäteho

Euroopan unioni
Euroopan aluekehitysrahasto

Vipuvoimaa EU:lta 2014–2020

11

Literature

Impola, R. & Tiihonen, I. 2011. Terminaalikäsikirja. Biopolttoaineterminaalit - Ohjeistus terminaalien perustamiselle ja käytölle. Available: http://www.vtt.fi/inf/julkaisut/muut/2011/VTT-R-08634-11.pdf

Virkkunen, M., Kari, M., Hankalin, V. & Nummelin, J. 2015. Solid biomass fuel terminal concepts and a cost analysis of a satellite terminal concept. VTT Technology 211. Espoo: VTT Technical research centre of Finland. 70 s.

Sikanen, L., Korpinen, O-J, Tornberg, J., Saarentaus, T., Leppänen, K. & Jahkonen, M. (eds.). 2016. Energy Biomass Supply Chain Concepts Including Terminals. BEST research program, WP3 Final Report, Luonnonvarakeskus. 76 p.