

UTILIZATION OF INDUSTRIAL SIDE STREAMS ORIGINATING FROM SAWMILLING – CHALLENGES AND SUGGESTIONS

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NOFOBE AND NB-NORD MEETING

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INTRODUCTION



Source: Maaseudun Tulevaisuus (2016)

In Finland,

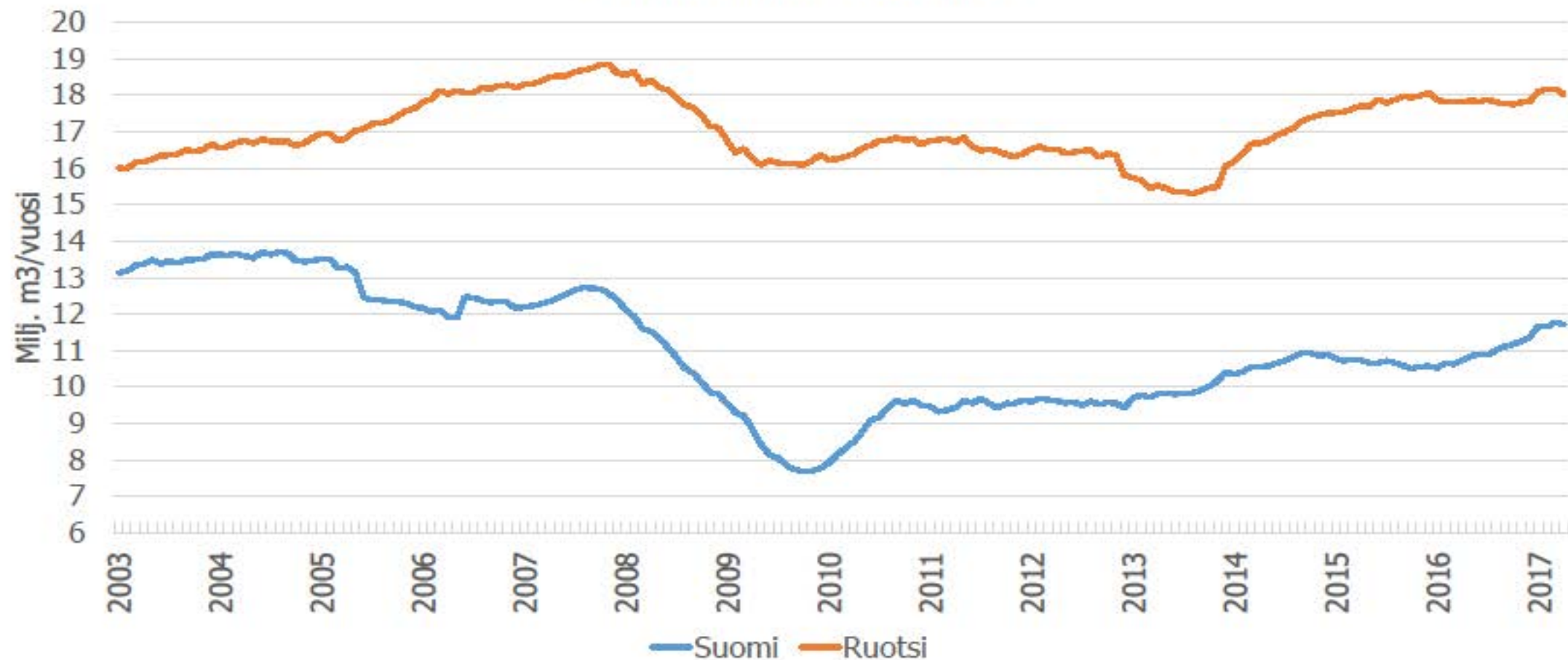
By-products form around 50% of the total output of saw mills

➤ by –product utilization rate highly affect the profitability of sawmilling

Finnish sawmilling industries is increasing the production volumes, in line with the Finnish bio-economy strategy

The industrial side streams are growing and efficient use is more important than ever

Sahatavaran tuotanto



INTRODUCTION

Utilization of by –products (Kopra & Vierumäen Teollisuus Oy 1999, Lindblad & Verkasalo 1999)

- Heat and electricity (the most of bark and sawdust are used for heat) Pulp production
- Particle and fiberboards
- wood-based composite and biofuel production

INTRODUCTION

- European Union has an ambitious target to increase circular economy
- Circular economy=keeping the value added in products and minimizing waste and disposal



Source: European Commission (2017)

INTRODUCTION

- Industrial side streams from sawmilling have a huge potential to contribute circular economy, if cascade use models are adopted
- Cascade use = reusing and recycling products as many times as possible before finally disposal via energy generation or landfilling (COM(2013) 659)
- Material use of wood has shown to have higher environmental and socio-economic benefits compared to energetic use (Gustavsson et al. 2006; Kim & Song 2014; Vis et al. 2016)
 - More Carbon stock in harvested wood products
 - Higher added value
 - Higher employment rate



INTRODUCTION

- The market situation of by-products is constantly changing

Short term	Long term
Summer/winter energy demand	Prevailing policies and strategies
	The market trends of wood product consumption
Transportation distances (where used)	Transportation distances (where used)

- For example, currently Finnish state aids for renewable energy favour virgin wood over by-products
 - **At times the utilization rate is extremely low**
- To develop value-adding business models for by-product utilization and increase the utilization rate, **long-term predictions are needed**



OBJECTIVES

Material use vs. energetic use of by –products and utilization rate in 2025 in Finland are analysed by:

- Identifying and analysing the factors impacting on by –product utilization
- Exploring ”what if” –scenarios:
 - I. Business as usual: The utilization rate and use of by-products is in 2025 the same as today
 - II. Incremental: 25% more of by-products is directed to material use in 2025 (compared to current situation)
 - III. Radical: 50% more of by –products is directed to material use in 2025 (compared to current situation)

METHODS – HOW TO PREDICT BY –PRODUCT UTILIZATION 2017-2025 (FINLAND)?

Scenario analysis approaches

First:

Identifying and analysing the impacting factors, drivers and barriers:

- Literature review and expert panel
 - Combination of quantitative and qualitative data

METHODS

Secondly:

Identifying the utilization rate of by –products, causal processes and contradictions

➤ Futures table for example

DESCRIPTION OF SCENARIOS

Business as usual:

Possible drivers	Possible barriers
The policies and strategies are the same <ul style="list-style-type: none">• Legislation• State aids/other support systems	New adopted national/EU strategies and policies <ul style="list-style-type: none">• Legislation• State aids/other support systems
No new biorefinery investments, no decreased industrial activity	Increased or decreased industrial activity
The long term market situation of wood products remains the same	Changing market situation

DESCRIPTION OF SCENARIOS

- Incremental: 25% more of by-products is directed to material use in 2025 (compared to

Possible drivers	Possible barriers
<p>Policies driving resource efficiency and material use</p> <ul style="list-style-type: none">• Legislation• State aids/other support systems	<p>Policies driving energetic use of by – products</p> <ul style="list-style-type: none">• Legislation• State aids/other support systems
<p>New biorefinery investments are actualized in Finland</p> <ul style="list-style-type: none">• Raw material demand increases• Transportation distances decrease	<p>Decreased industrial activity</p> <ul style="list-style-type: none">• Raw material demand decreases• Transportation distances increase
<p>Increasing local demand of wood products</p>	<p>Decreasing local market demand of wood products</p>

DESCRIPTION OF SCENARIOS

- Radical: 50% more of by –products is directed to material use in 2025 (compared to current situation)

Possible drivers	Possible barriers
<p>Policies driving resource efficiency</p> <ul style="list-style-type: none">• Legislation• State aids/other support systems	<p>Policies driving virgin wood harvesting</p> <ul style="list-style-type: none">• Low payed prize of by -products
<p>New biorefinery investments are actualized in Finland</p> <ul style="list-style-type: none">• Raw material demand increases• Transportation distances decrease	<p>Decreased industrial activity</p> <ul style="list-style-type: none">• Raw material demand decreases• Transportation distances increase
<p>Increasing local demand of wood products</p>	<p>Decreasing local market demand of wood products</p>

EXPECTED IMPACTS OF SCENARIOS

- Business as usual: The utilization rate and use of by-products is in 2025 the same as today
 - At times the utilization rate of by-products is low and it hinders the profitability of sawmilling
 - Energy use of by-products is still the main target
 - No increased carbon stock
- Incremental: 25% more of by-products is directed to material use in 2025 (compared to situation today)
 - The overall utilization rate of by-products increases
 - The revenues of the sawmill industries increase
 - A minor increment in carbon stock in HWP due to longer lifetimes of by-products
 - The raw material flow to energy generation may decrease and cause increased harvesting rates
- Radical: 50% more of by-products is directed to material use in 2025 (compared to situation today)
 - The overall utilization rate of by-products increases
 - The revenues of the sawmill industries increase
 - Clear increment in carbon stock in HWP due to longer lifetimes of by-products
 - The raw material flow to energy generation may decrease and cause increased harvesting rates

UTILIZATION OF THE RESULTS

- Knowledge of how different circumstances affect side stream utilization
- Decision makers are able to offer or support drivers for high and value adding utilization of by –products
- If new practices in by –product utilization or new material use driving policies are adopted (for example for cascading), negative trade-offs could be avoided by understanding the risks and indirect impacts
- The Finish forest industries can improve their material supply and efficiency, but also develop new practices to improve profitability of the side stream business

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Thank you!