BOOSTING RURAL BIOECONOMY
NETWORKS FOLLOWING
MULTI-ACTOR APPROACHES

Innovative finnische Praktiken

Netzwerk „Bioökonomie in der Praxis“
Online-workshop: Regionale Bioökonomie in Zeiten der Krise

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101000375

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Energieholzterminals als Teil der Hackschnitzel-Lieferkette

Robert Prinz, Kari Väätäinen (Luke) & Jyrki Raitila (VTT)

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Energieholzterminals als Teil der Hackschnitzel-Lieferkette

Photo: Hakevuori Oy

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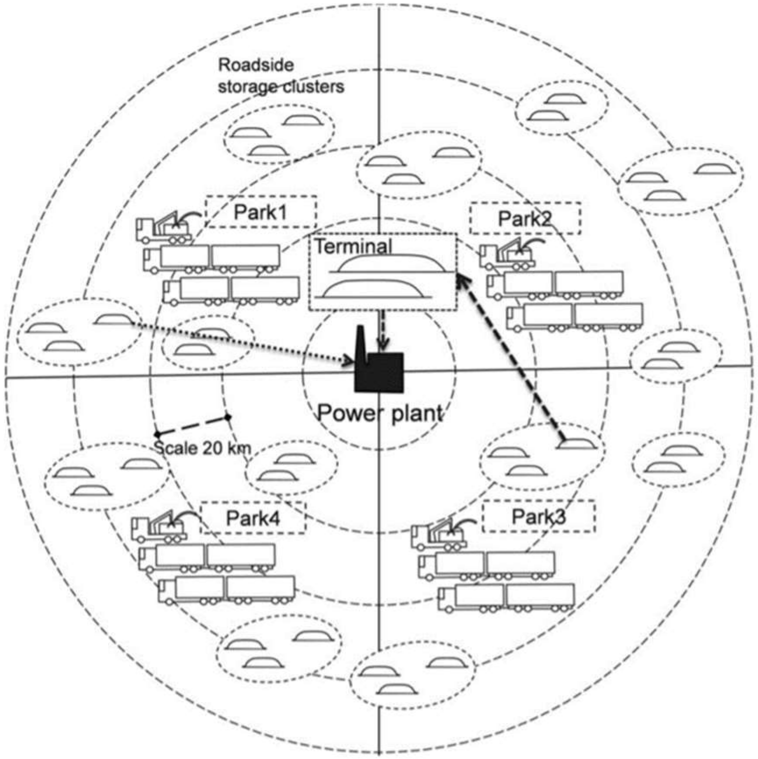
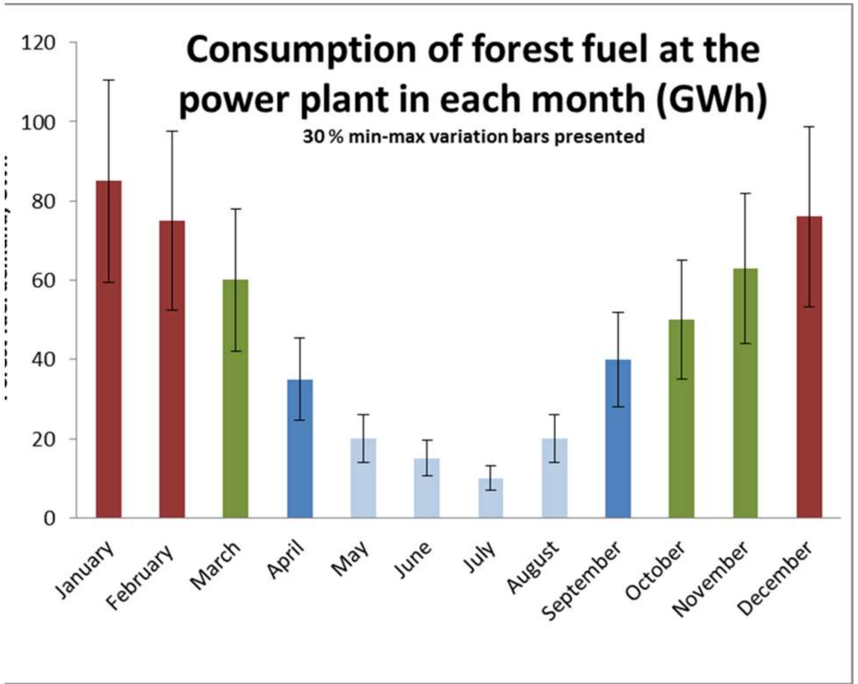
Ausgangszustand





Quelle: Väätäinen, Kari; Prinz, Robert; Malinen, Jukka; Laitila, Juha; Sikanen, Lauri. 2017. Alternative operation models for using a feed-in terminal as a part of the forest chip supply system for a CHP plant. Global change biology. Bioenergy, GCB Bioenergy 9 11: 1657-1673.

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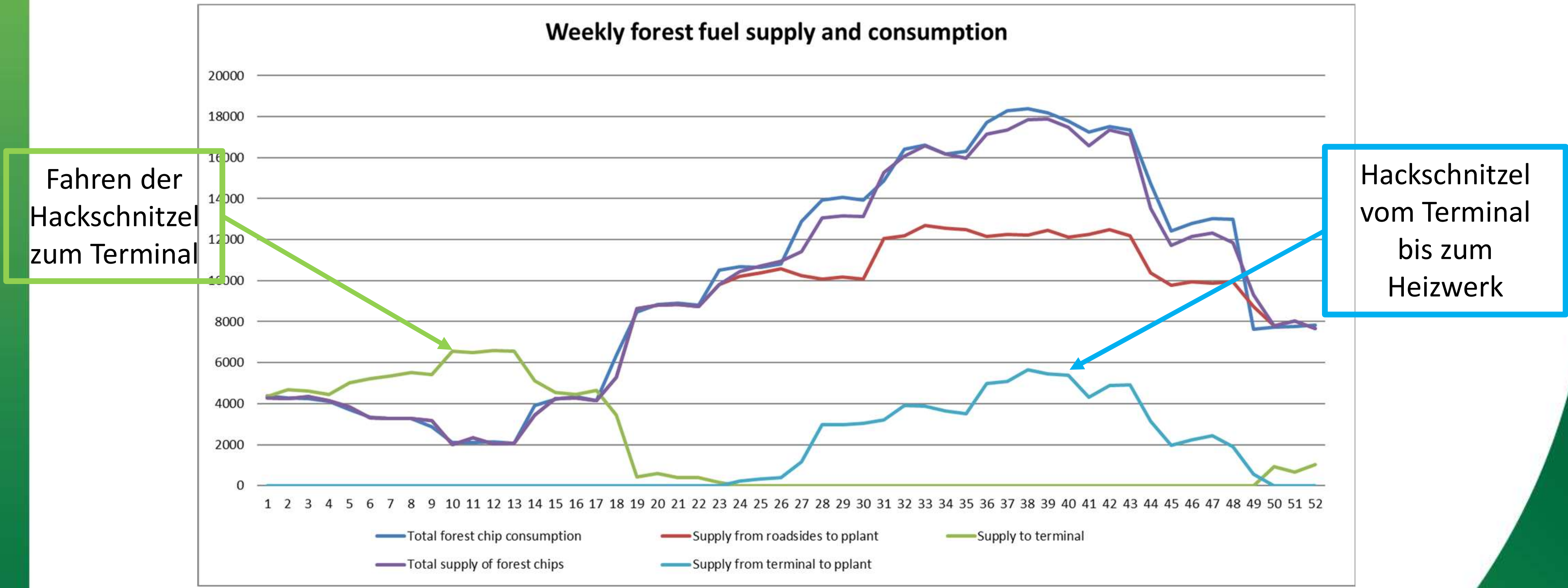
Hackschnitzel passieren das Terminal



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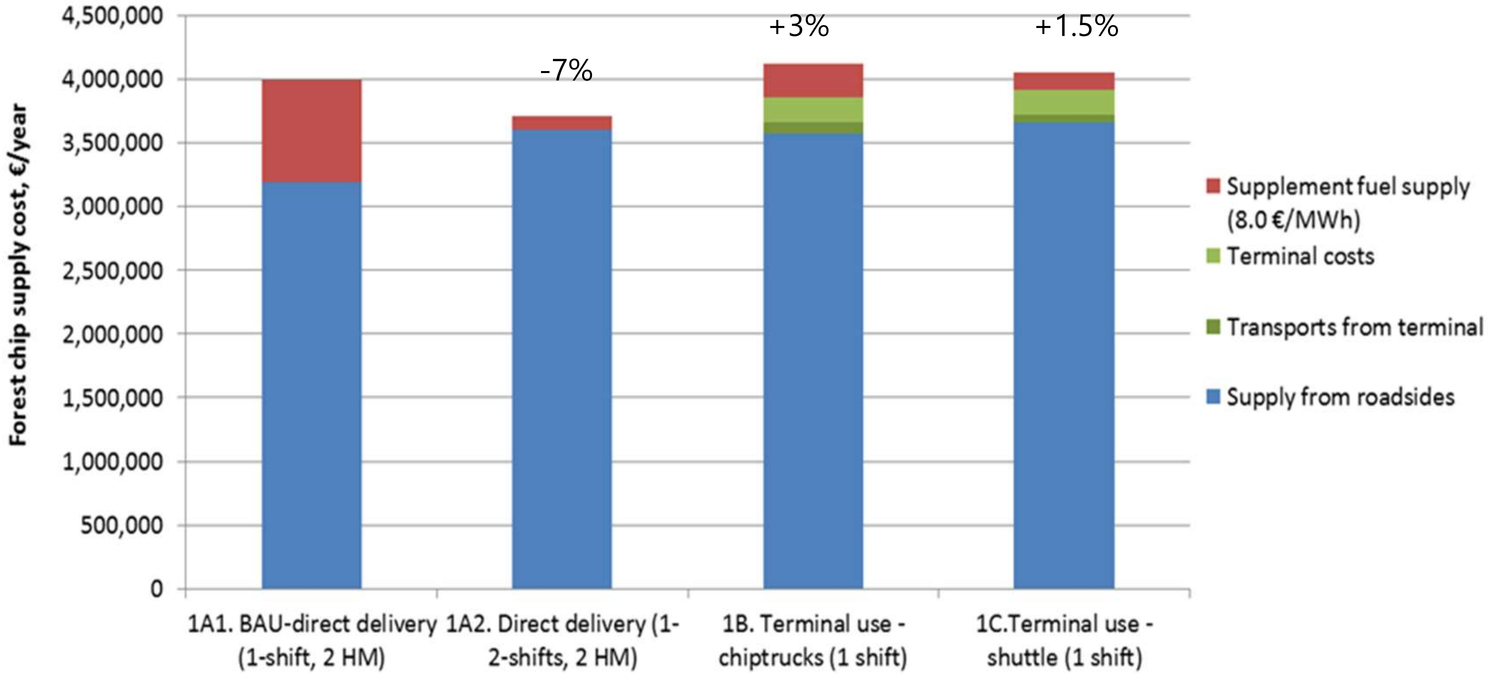
Ergebnisse



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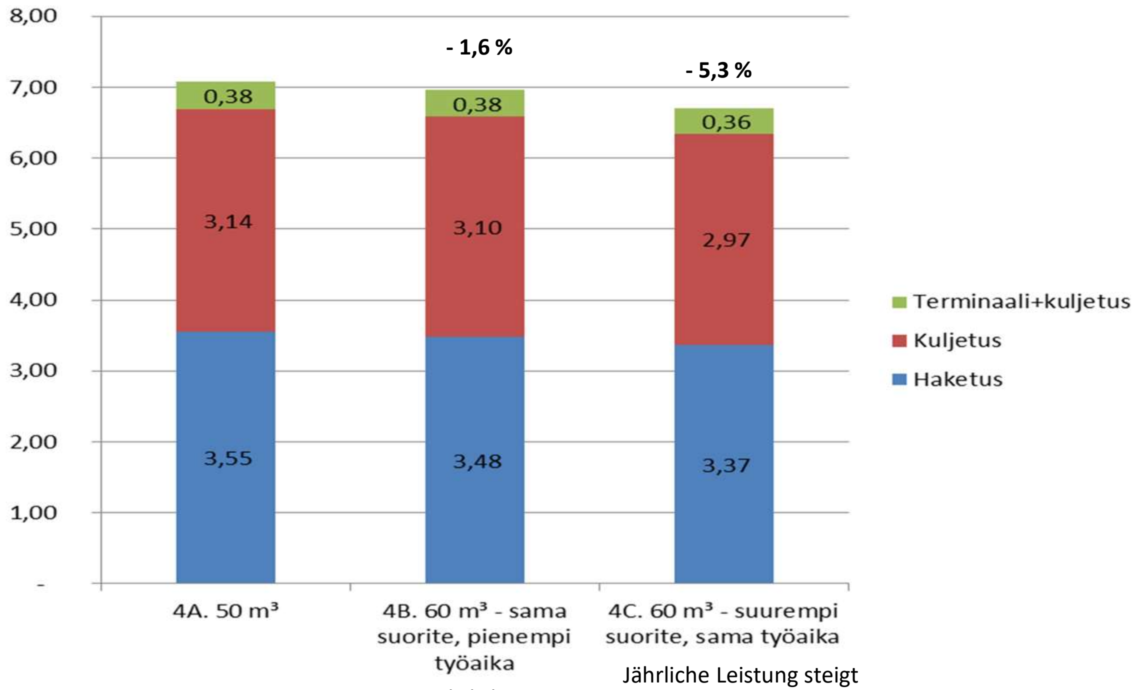
Ergebnisse

Einfluss der Lastgröße auf die jährlichen Lieferkosten, €/MWh:



Die jährliche Arbeitszeit wird um mehr als 10 % sinken

Jährliche Leistung steigt um mehr als 10 % (60.000 MWh/Jahr mehr)

Der Investitionspreis eines 60-m³-LKWs liegt um 40.000 € höher und der Kraftstoffverbrauch um 7 l/100 km höher

Quelle: Väätäinen, Kari; Prinz, Robert; Malinen, Jukka; Laitila, Juha; Sikanen, Lauri. 2017. Alternative operation models for using a feed-in terminal as a part of the forest chip supply system for a CHP plant. Global change biology. Bioenergy, GCB Bioenergy 9 11: 1657-1673.

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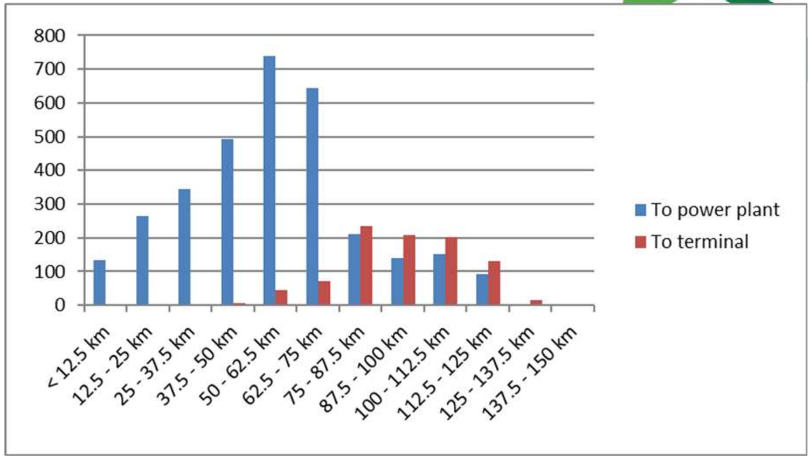
Schlussfolgerungen



Energieholzterminal ++

Eine gleichmäßigere Auslastung sichert den Betrieb; ganzjährige Beschäftigung, höhere Maschinenauslastung

In schwierigen Liefersituationen bei der Hackschnitzellieferung und bei Verbrauchsspitzen wird die Notwendigkeit reduziert, auf alternative und teure Brennstoffe zurückzugreifen

Verteilung von weit entfernten Holzenergie-Standorten kann zum Terminal geleitet werden, teure Straßenunterhaltskosten im Winter, kleinere Lagerorte, geringere Verluste im Terminal

Quelle: Väätäinen, Kari; Prinz, Robert; Malinen, Jukka; Laitila, Juha; Sikanen, Lauri. 2017. Alternative operation models for using a feed-in terminal as a part of the forest chip supply system for a CHP plant. Global change biology. Bioenergy, GCB Bioenergy 9 11: 1657-1673.

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Schlussfolgerungen

Energieholzterminal --
Einrichtungs- und Wartungskosten; zusätzliche Kosten
Ein zusätzlicher Schritt und zusätzliche Funktionen gegenüber der Direktlieferung; zusätzliche Kosten

Energieholztransport zum Terminal mit hacken am Terminal
- Effizienter Transport, straffe Lagerung und Qualitätskontrolle, effizientes und bedarfsgerechtes Hacken

Weitere Ergebnisse aus der Publikation:

Väätäinen, Kari; Prinz, Robert; Malinen, Jukka; Laitila, Juha; Sikanen, Lauri. 2017. Alternative operation models for using a feed-in terminal as a part of the forest chip supply system for a CHP plant. Global change biology. Bioenergy, GCB Bioenergy 9 11: 1657-1673.

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Weitere Infos:

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36 PRACTICE ABSTRACT

Biomass terminals for securing wood chip supply

According to Hakevuori Ltd's CEO Reijo Wuorio, the main function for their terminals is to secure the supply of wood chips to heat and power plants, especially when direct supply from roadsides is not possible during frost-heave and bad road seasons in spring and autumn. "In addition, chip supply is solely executed from terminals during weekends, and as a balancing supply at times with a simultaneous occurrence of high fuel demand and failures of chippers."

While the share of small sized whole trees and delimbed stemwood has risen, the need of terminals for storage and terminal chipping has increased. "The supply costs of delimbed stemwood chips are lower via terminals due to high payloads of timber trucks and nearly too times higher chipping productivity compared to chipping at roadside storages." Wuorio highlighted that many heat and power plants have limited storage capacity to only a few days' buffer at fuel yards, which again increases the importance of terminals for securing the uninterrupted supply to plants.

In the Nordic context, forest biomass terminals are typically large and are usually uncovered, thus resulting in lower investment costs compared to warehouse type of terminals requiring expensive construction. Large terminals with big heaps and piles of fuel feedstock, snow removal, and asphalt pavement will improve the quality of forest chips. Smaller terminals with no pavement are also essential to store uncomminuted wood transported from the roads with low trafficability and expensive road care (e.g. snow ploughing) in winter during high fuel demand.

Facts

In Finland in 2021, the forest chips use in heat- and power plants was 9.4 milj. solid-m³, consisting of chips of small wood (62%), logging residues (29%), low quality roundwood (7%) and stumps (3%). Chipping at roadside still dominates the wood chip supply (53 %), while chipping at terminal has raised to new record (36%) rest being chipping at end-use facilities (11%).

KEY WORDS

Bioenergy, rural areas, biomass, biomass terminals, forest chips, logistics

COUNTRY/REGION

Southern Finland

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42 PRACTICE ABSTRACT

Preferred wood biomass feedstock characteristics for biomass procurement decision-making by end-users

In improving the decision-making process for industrial end-users of wood biomass, it is important to understand the end-users' perceptions of biomass properties in relation to their conversion processes and supply preferences.

The aim of an expert analysis was to get an insight into end-users' views on preferred wood biomass feedstock characteristics. The features investigated included facility location, its size, biomass storage, handling, and procurement for different wood-based industrial services. The results can support product development and secure new roles in alternative business environments by existing and future terminals or so-called biohubs.

From an industrial biomass end-user's perspective, a pre-defined biomass assortment is a vital aspect when deciding on feedstock procurement at a bioenergy facility. The key decision-making attribute seemed to be the type of biomass assortment. Sawdust was the most preferred type (35%), followed by stem wood chips (20%) and energy wood (15%) of a total of seven biomass assortment sub-categories (stem wood chips, sawdust, logging residues & tree part chips, pulpwood, bark, agricultural residues & by-products, energy wood/low quality roundwood).

Most facilities had a good understanding of generally defined assortments, but their views on specific biomass properties (e.g. ash content levels, particle size, and moisture content) were rather unclear and weakly defined. The accepted range of biomass moisture content was very wide, even though most facilities received their feedstock within 10% of their estimated optimum.

KEY WORDS

Bioenergy, expert analysis, decision making, terminals, biohubs, end-users;

COUNTRY/REGION

Finland, Poland, Spain

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NTN meeting 30/11/2022

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38 PRACTICE ABSTRACT

Biomass Atlas makes Finnish biomass maps freely available to everyone

Biomass Atlas is an open service that collects location-specific data about biomass potentials under a single user interface (https://projects.luke.fi/biomassa-atlas/en). The service enables users to calculate the amount of biomass in a given geographical area, as well as examining the opportunities to utilise the biomass and restrictions on its use. The area can be freely outlined on the map or selected based on administrative boundaries. It is also possible to set a point of interest and define the area around it – either by giving the radius of a circle or the road transport distance.

The map user interface allows user to search, analyse and report on biomass from forestry, agriculture, and biodegradable waste from communities and industry. There are approximately 300 map layers of different biomass types or land use categories in the map user interface. It is not necessary to register and log in, but if you do so, you will enable some extra features like saving your biomass search and analysis.

The goals of making the biomass data available include supporting investment decisions and sustainable use of natural resources, as well as helping decision-makers to create sustainable energy policies. Biomass Atlas is available in Finnish, Swedish and English.

A service extending to Sweden and the Baltic countries was developed based on the good experiences of Biomass Atlas (https://forest-energy-atlas.luke.fi, see figure on next page). Forest Energy Atlas has similar functionalities but is constrained on forest biomasses. This service is available in English, Finnish, Swedish, Estonian, Latvian and Lithuanian.

ABOUT BRANCHES

BRANCHES is a H2020 "Coordination Support Action" project, that brings together 12 partners from 5 different countries. The overall objective of **BRANCHES** is to foster knowledge transfer and innovation in rural areas (agriculture and forestry), enhancing the viability and competitiveness of biomass supply chains and promoting innovative technologies, rural bioeconomy solutions and sustainable agricultural and forest management.

KEY WORDS

Bioenergy, biomass, harvesting potential, decision support, circular bioeconomy

COUNTRY/REGION

Finland, Sweden, Estonia, Latvia, Lithuania

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26 PRACTICE ABSTRACT

Non-timber forest products (NTFPs) as market possibilities for both forest owners and bioeconomy

Non-timber forest products (NTFPs) are products of biological origin that are derived from forests, but not timber. In Finland, berries and mushrooms are commonly known and used NTFPs in households for food and nutritional diversity. At the local, national, and international markets, there is a wide variety of other NTFPs that are used increasingly in the food sector, cosmetics, and health-promoting products. Still, NTFPs are a minor forest product in terms of their direct monetary value compared to timber, despite their potential use in products with high added value. In most cases, the production of NTFPs is not in conflict with timber production and the joint production is feasible. Thus, boosting NTFPs value chains is needed in the Finnish rural bioeconomy.

At the market, Finnish NTFPs are highly competitive due to their natural purity, high nutrient contents and reliable source of origin. Since labelling organic products has been found to affect consumers' perceptions of a product, the aim is to make Finnish private forest owners aware of the need for certified organic forests and get them involved. The challenge is that the forest owners who do not utilize the NTFPs of their own forests do not benefit from the organic certification.

The production of NTFPs not covered by everyman's right (e.g., birch sap and cultivated mushrooms) can create significant additional income for forest owners compared to timber production alone.

Birch sap is one of the most abundant NTFPs in Finnish forests. In large-scale sap tapping, where thousands of birch trees are tapped, requires investments in equipment (e.g., spouts, drop lines, tubes, fittings, installing tools, sap tanks, and a vacuum pump) and labor costs in installing and maintenance. Also considering the possible decrease in timber quality and value due to taphole wounds, sap tapping is profitable for forest owners. Despite its huge potential, there are only a few local companies buying sap collected by forest owners mainly as a family activity.

New value chains, based on specialty mushroom cultivation, have recently been introduced to Finnish forestry. Living birch trees (*Betula* spp.) are inoculated with pakuri (*Inonotus obliquus*) by drilling holes in trunk and installing inoculation plugs in the holes. Cultivating pakuri in set-aside birch stands, there is no conflict with timber production. Specialty wood-decay mushrooms can be cultivated on stumps without any effect on timber production. For example, reishi (*Ganoderma lucidum*) could be cultivated in connection with harvesting operation like spreading the control agents in stump treatment against *Heterobasidion* spp. root rot. Both mushroom species are collected from forests naturally grown but the cultivation will increase the quantity supplied to the market.

Cultivated pakuri on birch. Photo Pyry Veteli/Luke.

KEY WORDS

Non-timber forest products; forest owners; multi-use of forest; organic certification; everyman's right; joint production.

COUNTRY

Finland

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Consiglio Nazionale delle Ricerche – Istituto per la BioEconomia

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UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

DBFZ

circe – RESEARCH CENTRE FOR ENERGY RESOURCES AND CONSUMPTION

ITABIA – Italian Biomass Association

MTK

aveBiom – Spanish Biomass Association

UFZ

W-M ODR

BioEconomy Cluster

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