BIOREGIONS

Forest bioeconomy in action

North Karelia Forest Bioeconomy profile

An overview of the North Karelian bioeconomy innovation ecosystem

Contents	North Karelia Forest Bioeconomy profile
Version	2.0
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Authors	Siebe Briers, Inazio Martinez de Arano, Timo Tahvanainen

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Foreword

The forest bioeconomy landscape is rapidly evolving across Europe. This document does not intend to give a comprehensive account of bioeconomy-related policies and actors, but rather to highlight the most relevant aspects and to identify key components of the regional bioeconomy ecosystem. It focusses on the circular forest-based bioeconomy, understood as the value chains that originate from forest products, typically wood, but also non-wood forest products (NWFP), and services, such as forest-based tourism.

In the opening section, we introduce the region and its vision on the *forest bioeconomy*. Here you can find information about the region's geography, economic profile, forests and the forest-based sector and the region's vision on the bioeconomy. This is followed by the second section, "Meet the actors", where we present the most relevant elements of the North Karelian forest-related bioeconomy ecosystem in ten categories: i) industrial clusters; ii) leading companies; iii) research and technological centres; iv) bioeconomy education and training programmes; v) public agencies supporting the forest bioeconomy; vi) business accelerators active or open to bioeconomy start-ups; vii) investors and venture capital companies open to forest bioeconomy; viii) some of the most relevant start-ups in the North Karelian ecosystem, ix) bioeconomy and entrepreneurship events; and, finally, x) important forest-related or innovation related information sources.

With this document, the Bioregions Facility aims at providing a summarised economical portrait of North Karelia that would be of interest for international forest bioeconomy actors (*Introduction chapter*) and capturing the current actors in the North Karelian forest bioeconomy ecosystem (*Meet the actors chapter*). The Introduction chapter provides a deeper understanding of the North Karelian forest bioeconomy ecosystem to (potential) entrepreneurs. For those entrepreneurs it is useful to know the conditions surrounding the forest bioeconomy (e.g., general economy and industry, forest-sector, etc.) and the actors they can contact for potential collaborations. The information about the bioeconomy actors can be used to assess the focus of the North Karelian bioeconomy sector and to identify opportunities. This document is a part of Bioregions' WP3 Awareness Toolbox – Task 3.2 Regions profiles & success cases.

Please contact the Bioregions team if you have suggestions to improve this document or corrections to be made. Thank you in advance.

The Bioregions Facility

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Introduction

North Karelia[1] is the easternmost region (NUTS3 level) of Finland and of continental Europe. Russia is a direct neighbour, and they share 300 km of border with the region. In North Karelia, East and West meet. With a population of 163,000 living in an area of 21,585 km^2, it is a sparsely populated region. North Karelia is a very natural area, with 70% of the area covered by forests and the presence of 2,200 lakes (almost 18% of the area). North Karelia has a boreal climate and an average annual temperature of only +2.5°C.

Joensuu, the main North Karelian city by population (around 76,000 people) is the economic centre of the region. Joensuu is a university city with the highest proportion of students to the number of inhabitants in whole Finland. Joensuu is about five and a half hours drive North-East from Helsinki (437 km) and North-West from Saint-Petersburg (428 km). Joensuu airport is located about 10 km from the city centre and connects Joensuu mainly to Helsinki. Joensuu also has a railway connection to four main directions, including a direct rail connection to Russia, which currently is only available for cargo. Joensuu also has a deep-sea harbour allowing regular freight connection to the Baltic Sea via the Saimaa channel. Waterway transport is available about 10 months per year.

The economic profile

North Karelia contributes around 2.3% to the national GDP and is one of the regions with lowest GDP/capita in Finland.[2] The most important sectors for North & East Finland[3]'s economy are: industry; trade & transport; and public administration (Figure 1). In contrast to the other Bioregions, in North & East Finland the sector agriculture, forestry and fishing reaches almost 8% of employment. The strongest industrial sectors in North & East Finland and North Karelia are forest industry, metal industry and construction (Figure 2). Within the North Karelia metal industry, the forest machinery and timber logistic sector plays an important role, comprising the biggest forest machine manufacturing hub in the world. The strong North Karelian photonics and ICT sectors are linked to the forestry sector, providing a good basis for new innovations linked to digitalisation, IoT and new service models. The region's key expertise in photonics focuses on diffractive and micro-optics and nano photonics (design, manufacturing, and applications), guided-wave optics, spectral imaging and VR/AR applications linked to expertise in 3D-printing and nanostructures. The forest ICT sector benefits from the region's vital and fast-growing software cluster, but also Finland's excellent open data sources: accurate GIS databases of built environment and up-to-date forest, weather and environment data have enabled the region to become a forerunner in forestry digitalisation. In addition, there is a long tradition and extensive expertise in the plastic industry with a current focus on injection molding of precision components for the health industry.

[1] https://www.pohjois-karjala.fi/web/english/north-karelia

[2] https://data.oecd.org/finland.htm

[3] North & East Finland is the NUTS2 entity containing North Karelia. It is used as an approximation for North Karelia because the information is not available at NUTS3 level.

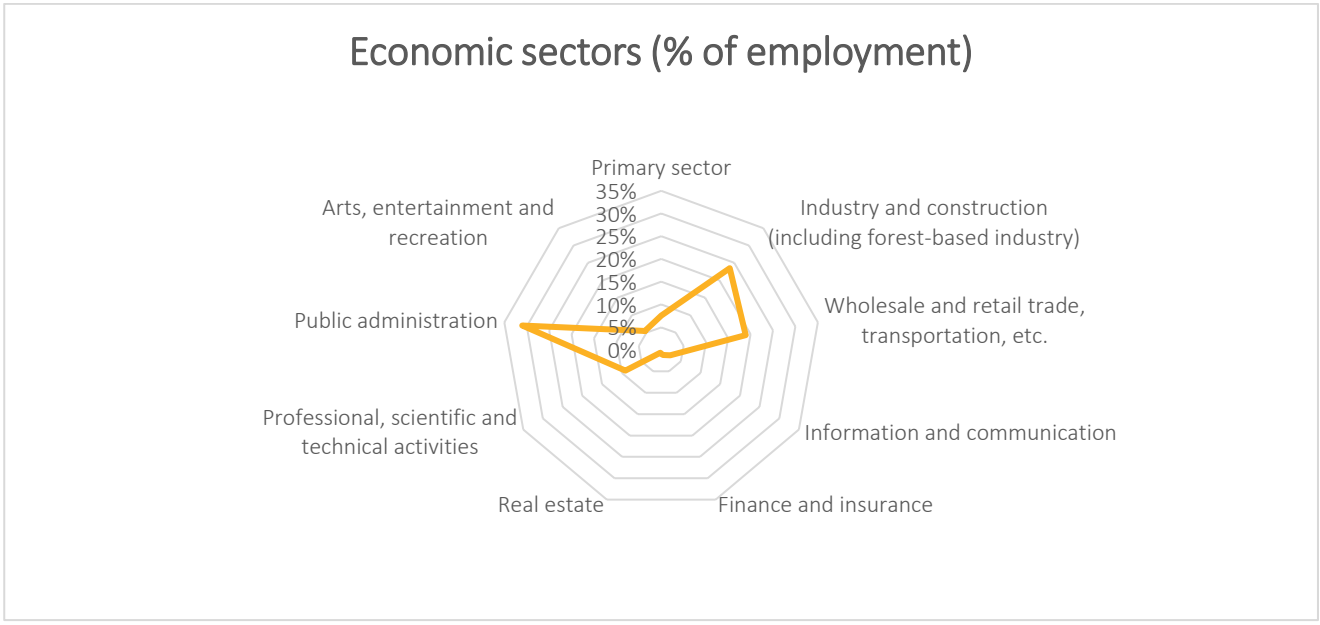

Figure 1: Distribution of employment in North & East Finland's economic sectors. Data obtained from regional benchmarking tool on smart specialisation platform (https://s3platform.jrc.ec.europa.eu/regional-benchmarking). The sectors are based on the major sectors of Eurostat's regional economic accounts which is based on the NACE rev2, a statistical classification of economic activities in the European community.

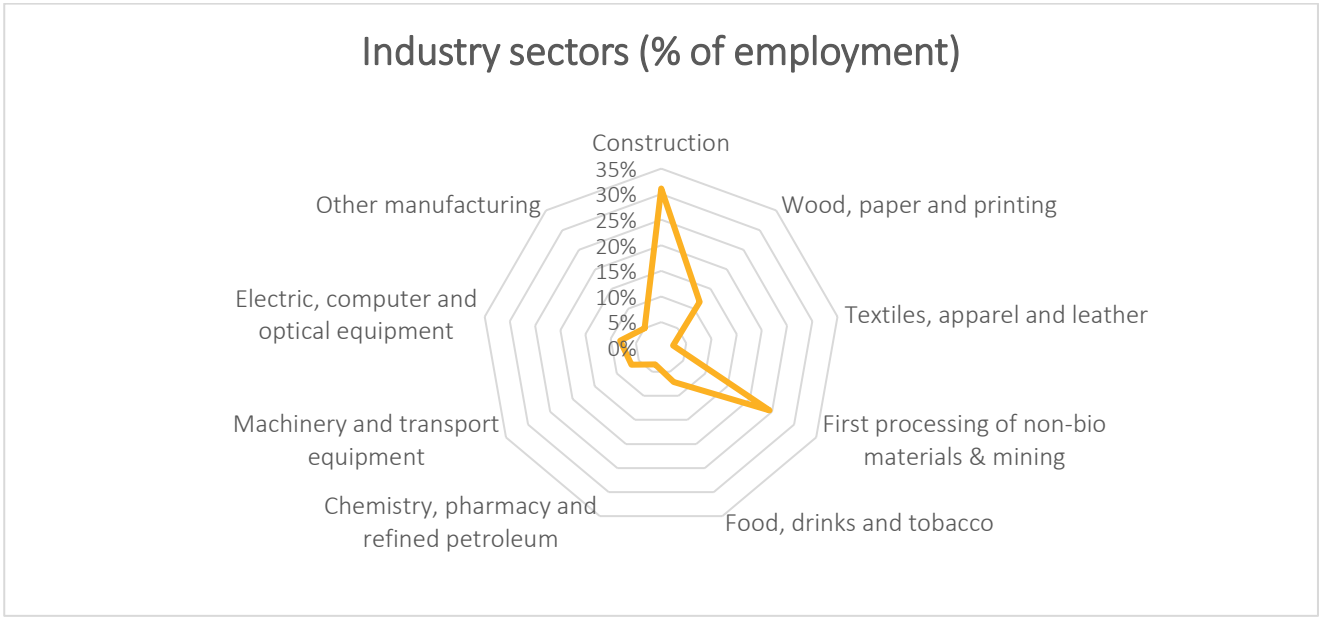

Figure 2: Distribution of employment in North & East Finland's industry sectors. Data obtained from regional benchmarking tool on smart specialisation platform (https://s3platform.jrc.ec.europa.eu/regional-benchmarking). The industrial sectors are a higher classification based on NACE rev2, a statistical classification of economic activities in the European community.

North & East Finland is a very specialised region with more than 60% of the patents in electrical engineering (Figure 3).

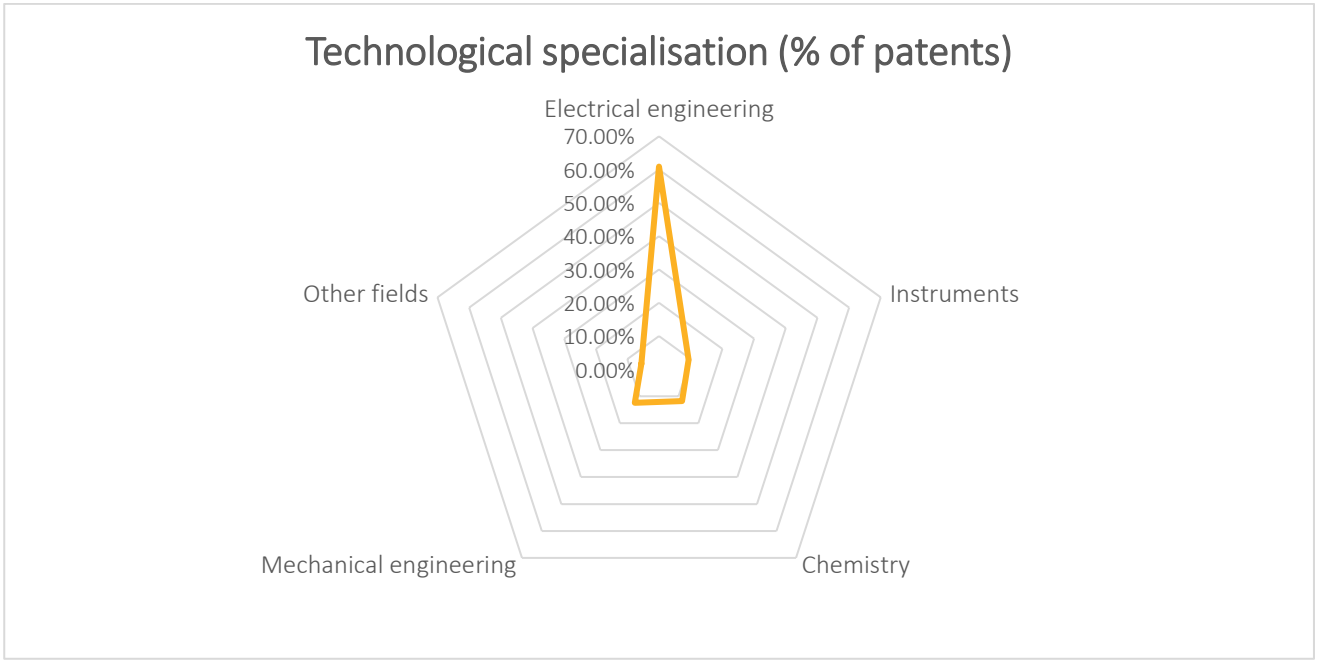

Figure 3: Technological specialisation in North & East Finland. Data obtained from regional benchmarking tool on smart specialisation platform (https://s3platform.jrc.ec.europa.eu/regional-benchmarking).

Research and education

Forestry and photonics are the region's key areas of expertise in research which gives a good basis and support for R&D intensive companies in these sectors. Forest inventory and management, forest technology, harvesting and logistics, wood material science and applications for wood construction are key areas of expertise in Joensuu. Current research topics are increasingly linked to global challenges like forests and forestry in relation to climate change and biodiversity. Resilient forestry and forest digitalisation are developed as key tools for adapting to new global challenges.

Characteristic to North Karelia's forest cluster is also strong integration in education: the region offers all the forestry education levels from training of forest machine operators, truck drivers, lumberjacks and more, from the Riveria Vocational School to the Forestry Engineer curriculum at Karelia University of Applied Sciences, and Forester and higher academic degrees at the University of Eastern Finland. A similar unique path for all education levels, from vocational to academic degrees, will soon be available in photonics, while the UEF´s Institute of Photonics has traditionally covered over 40% of academic photonics degrees in Finland. Several other degree programs - like Environmental Policy and Law at the University of Eastern Finland – have a strong focus on applications in forestry and bioeconomy. This, together with a versatile business sector, creates a strong, multidisciplinary regional forest bioeconomy cluster. The university of Joensuu is also known for its activity in international forestry and for managing international degree programs.

The innovation profile

Cleantech innovation at country level

Finland is a cleantech leader, as it ranks second of 40 countries in the overall Global Cleantech Innovation Index (2017)[4], scoring from "good" to "very good" for all pillars (Figure 4). In terms of input drivers, Finland has the best score for *emerging cleantech innovation* (high score for all indicators) and the second best for *cleantech-specific innovation drivers*, thanks to the high cleantech R&D budget and the number of cleantech funds present. Finland scores somewhat lower in output-related indicators. Notably, Finland seems to be less attractive for *renewable energy investment* and shows also relatively lower performance in *cleantech import and export*. For this reason, Finland's evidence of *commercialised cleantech innovation* is good, but nuanced. Nevertheless, Finland is the 4th most efficient innovator, as it achieves very high outputs of innovation relative to its inputs to innovation.

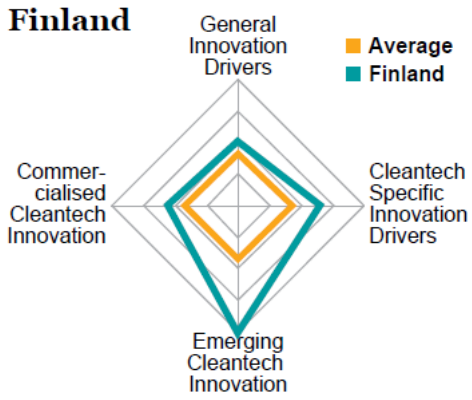

Figure 4: Finland's score for the four Global Cleantech Innovation Index pillars (*General Innovation Drivers, Cleantech-Specific Innovation Drivers, Emerging Cleantech Innovation and Commercialised Cleantech Innovation*) in comparison with the average. Source: Clean Tech Group and WWF, 2017.

Regional Innovation Scoreboard

North & East Finland (NUTS 2 that contains North Karelia) was considered a "*strong +" innovator* in 2019's Regional Innovation Scoreboard and its innovation performance has increased over time (10.7%). North & East Finland scores rather poorly relative to Finland as a whole (except for higher Non-R&D innovation expenditures), but scores well at the European level. Relative to the EU, North & East Finland is very strong in *Lifelong learning*. Some other relative strengths are *Product/Process innovations*, *SMEs innovating in-house* and *Innovative SMEs collaborating*. Relative weaknesses are *Employment in medium- and high-tech manufacturing & knowledge intensive services*, *Design applications*, *Trademark applications* and *Sales new-to-market/firm innovations*.

Bioeconomy readiness

[4] The aim of the Global Cleantech Innovation Index (GCII) is to rank countries based on their potential to produce entrepreneurial cleantech start-up companies and commercialise clean technology innovations. This index provides important insight about the performance of countries (used as approximation for the regions) in the bioeconomy innovation environment. The GCII is determined by four equally weighted pillars: *general innovation drivers*; *cleantech-specific innovation drivers* refers to the policy environment, cluster activity and access to finance; *emerging cleantech innovation* refers to early-stage investments, patents and high impact companies, etc.; and *commercialised cleantech innovation* refers to the size of current markets (imports, exports, employment, etc.). Source: Clean Tech Group and WWF, 2017: The Global Cleantech Innovation Index 2017: Which countries look set to produce the next generation of start-ups?

North & East Finland is rated 9 out of 10 for its maturity in bioeconomy readiness[5] and thus it can be considered to have a very mature bioeconomy Research & Innovation ecosystem.

The Forests and the forest-based sector[6]

North Karelia has about 1.5 million ha of forest, this corresponds to 89% of North Karelia's land area (and 70% of the total area including lakes). 96% of the forest area is commercial forest. Wood stocks are estimated at 195 million m^3 with an annual growth of 8.9 million m^3/year. The total volume of wood harvested annually is around 66% of the annual growth (about 5.9 million m^3).

The wooded area in North Karelia is dominated by conifers. About 60% of the forest area is dominated by pines, 25% by spruce and 15% by deciduous trees. Through history, the forests have been largely felled, grazed, and then used for active timber production. Historically, forest fires and slash and burn culture have regenerated forest and modified their flora and fauna. The result can be seen in the region's forests, there are few old and natural forests, and most forests are monocultures.

In North Karelia, 55% of the forests is privately owned, 24% is state-owned and 21% is owned by companies. For private, small-scale forest owners, forests can deliver a significant source of income.

The region's forest bioeconomy is very strong with more than 500 companies involving bioeconomy. These companies have a turnover of €2 billion and employ more than 6,600 people of which 600 experts (researchers, developers, trainers, and administrative employees). The European Forest Institute has its Headquarters in regional capital Joensuu.

Biomass availability

It is no wonder that almost all the biomass available in North Karelia is coming from forests (Figure 5). Two-thirds of the available biomass is roundwood (Forest production). North Karelian bioeconomy entrepreneurs should focus on using forest biomass as a resource.

[5] The bioeconomy readiness index describes the bioeconomy Research & Innovation maturity level of EU regions. The index is based on four variables: Regional Innovation Scoreboard, existence of specific bioeconomy strategies, existence of bioeconomy related clusters and the intensity level of bioeconomy related activities. The regions obtain a score from 1 to 10 with a score of 5 being the median. Regions with a score of 9 belong to the 7.6% best. Source: European Commission, 2017: Bioeconomy development in EU regions.

[6] https://metsakeskus.maps.arcgis.com/apps/MapSeries/index.html?appid=3e2b8c3f85b747f0a39ad8261504cf0e

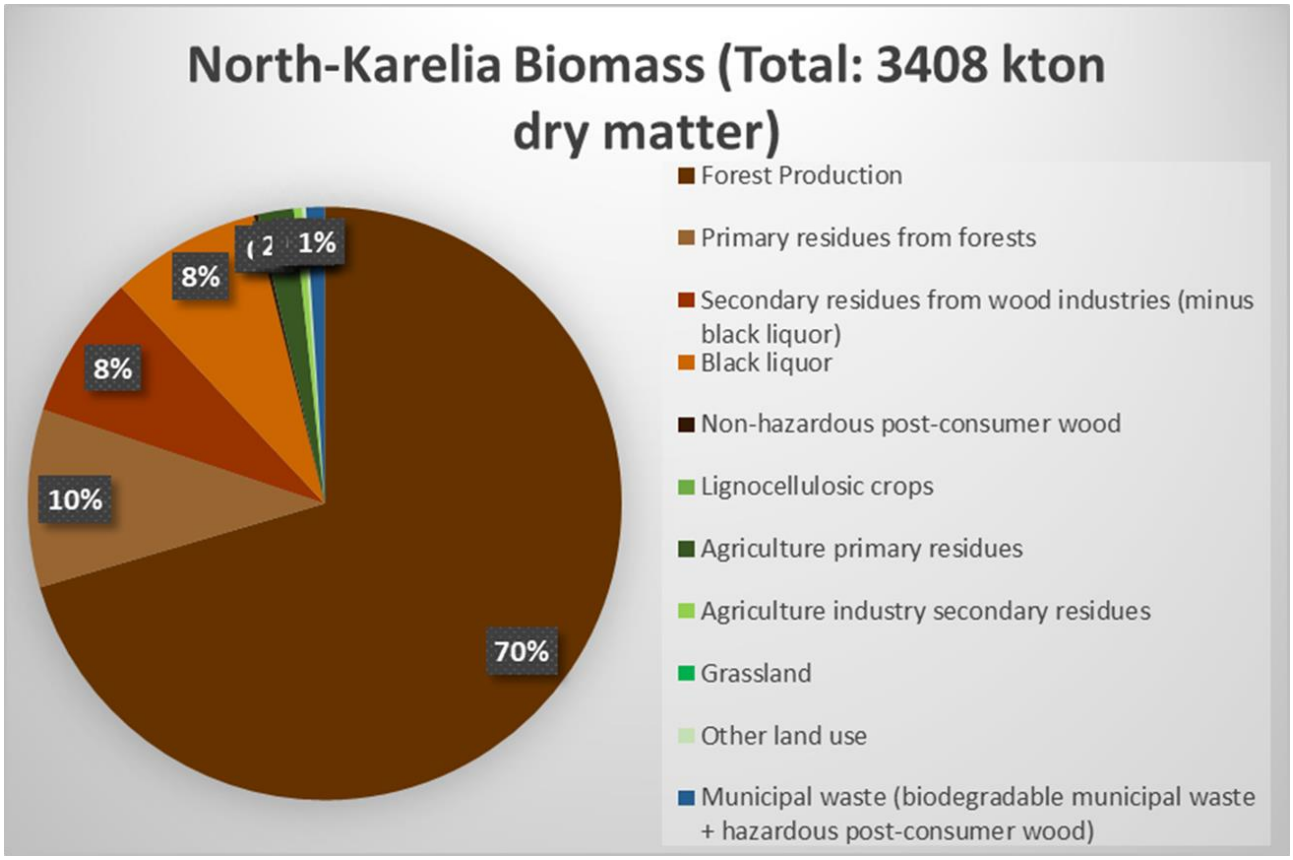

Figure 5: Estimated biomass availability in North Karelia. The brownish colours are related to forest biomass, the greenish colours to agricultural biomass and the blue colour to municipal waste. Based on data from S2Biom.

North Karelia has by far the highest biomass availability per capita of the three Bioregions (Table 1). This is related to the small population living on a big surface with many forest resources. Domestic material consumption per capita, the total amount of material directly used in an economy, is also the highest of the three Bioregions. North Karelia has good potential for substituting its material needs with biomass (64%).

Table 1: Estimated biomass availability per capita, domestic material consumption per capita at a national level and proportion of domestic material use that can be substituted with available biomass. Data obtained from S2Biom and EU Open Data portal [7].

	Available biomass (ton/capita)	Domestic material consumption (ton/capita)	Available biomass/ Domestic consumption
Basque Country	0.89	8.82	10%
North Karelia	20.77	32.48	64%
North Rhine-Westphalia	0.79	14.79	5%

[7] https://data.europa.eu/euodp/en/data/dataset/PWZDbPY2plUCL8qiHmOFA

A vision on the forest bioeconomy[8]

The forest bioeconomy is the cornerstone of the region's business and industry sector. North Karelia has strong research and expertise in the forest bioeconomy sector with many actors contributing to the knowledge. Educational organisations, such as the University of Applied Sciences and the University of Eastern Finland, research institutes, such as the European Forest Institute, Natural Resources Institute Finland (LUKE) and the Finnish Environment Institute, companies and other actors all contribute to North Karelian forest bioeconomy knowledge.

The forest bioeconomy is a vital part of the North Karelian Smart Specialisation Strategy, also in addition to playing a key role in their Roadmap towards becoming an oil-free and low-carbon region. The carbon footprint of North Karelians is currently 36% smaller than that of an average Finn and renewable energy accounts for 64% of total regional energy consumption. In 2030, North Karelia wants to be 100% free of fossil fuels, have a 100% share of renewable energy in their total consumption and achieve a net reduction of greenhouse gasses of 80%. Also, they want their bioeconomy to reach a turnover of €2.7 billion (currently €2 billion).

Within the bioeconomy, North Karelia aims to be a forerunner in wood construction, produce a wide range of value-added bioproducts, create jobs, ensure ecosystem services, have an efficient use of forest industry by-products, promote climate smart forestry, apply research to business, use digital forest data and provide education at all levels.

Bioeconomy in the North Karelian Research and Innovation Smart Specialisation Strategy (RIS3)[9]

The North Karelian Smart Specialisation Strategy consists out of two essential parts. 1) New solutions for the forest bioeconomy, and 2) Technologies and materials as enablers of growth (Figure 6). Within both parts, six areas of expertise are defined (Figure 6).

[8] https://www.pohjois-karjala.fi/documents/78299/3959112/Forest%20Bioeconomy%20in%20North%20Karelia%202019.pdf/1c7d4af2-3d96-9bd3-70f5-06c669688f47

[9] https://s3platform.jrc.ec.europa.eu/documents/20182/0/North_Karelia_Smart_Specialisation.pdf/24c3511c-4b48-470c-a7be-ccf777a52763; https://www.pohjois-karjala.fi/en/web/smarteast.fi/home

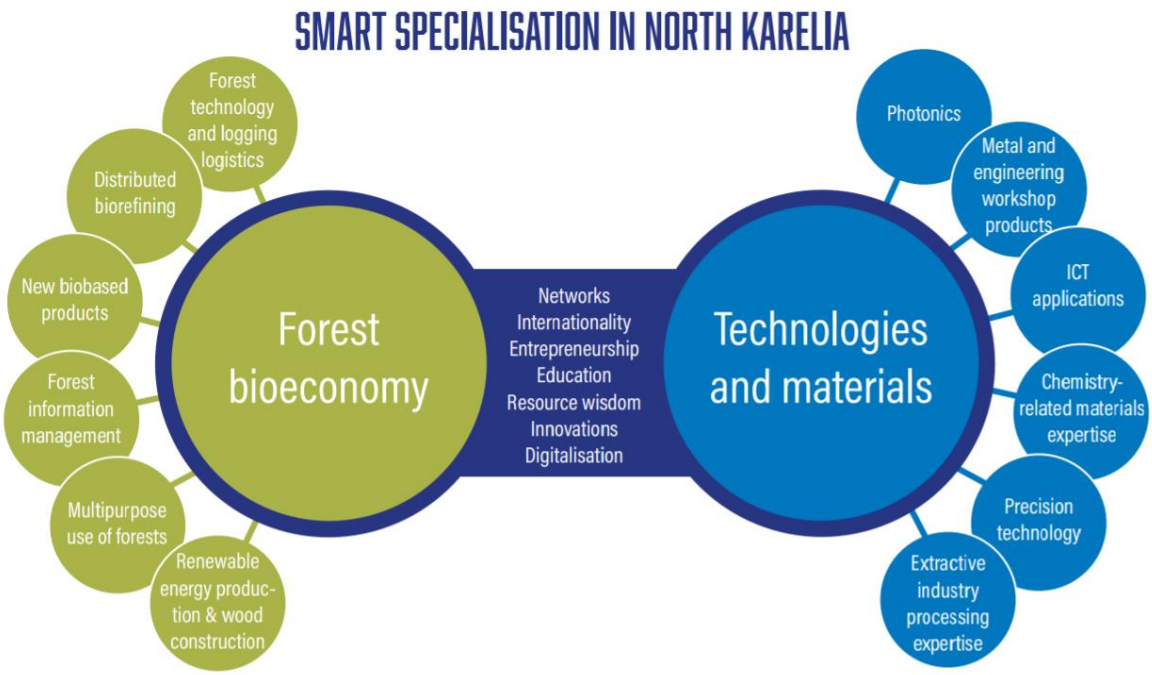

Figure 6: Smart specialisation in North Karelia

The forest bioeconomy is the sector with the strongest research and expertise in North Karelia. As expressed in their Smart Specialisation Strategy, the region wants to use this opportunity to further develop the forest bioeconomy. The forest bioeconomy sector is characterised by a strongly collaborative environment. The main challenges of the forest bioeconomy sector are the transfer and application of research knowledge to the needs of businesses and the incorporation of an entrepreneurial angle to the sector's development work. The sector should aim at producing products and services with higher added value. In the RIS3 strategy, it is stated that "the mobility and transfer of experts from research institutes and educational organisations to companies should be increased and used to create a spill over effect for the entire industry". North Karelia is very well placed within Bioregions to increase entrepreneurship in the forest bioeconomy sector.

Several of North Karelia's areas of expertise within the technologies and materials sector also have potential in the forest bioeconomy, e.g. photonics, ICT applications and chemistry-related materials expertise (Figure 6).

Reference documents

- Regional Council of North Karelia. Smart specialisation in North Karelia. https://s3platform.jrc.ec.europa.eu/documents/20182/0/North_Karelia_Smart_Specialisation.pdf/24c3511c-4b48-470c-a7be-ccf777a52763
- Forest Bioeconomy in North Karelia https://www.pohjois-karjala.fi/documents/78299/3959112/Forest%20Bioeconomy%20in%20North%20Karelia%202019.pdf/1c7d4af2-3d96-9bd3-70f5-06c669688f47
- North Karelia & Smart forest bioeconomy: https://www.pohjois-karjala.fi/documents/78299/3959112/Smart%20Forest%20Bioeconomy%20Brochure.pdf/a4f741eb-8b14-0845-362d-e58721cbb695

- https://www.pohjois-karjala.fi/en/web/smarteast.fi/home
- POKAT 2021. North Karelia's Regional Strategic Programme for 2018-2021: https://www.pohjois-karjala.fi/documents/33565/34607/POKAT+2021+Summary.pdf/80583d66-9e7b-d4f6-8e90-3dc0a4552dac?version=1.0
- Climate and Energy Programme of North Karelia 2020: A summary. https://www.pohjois-karjala.fi/documents/78299/173745/Climate%20and%20Energy%20Programme%20of%20North%20Karelia.pdf/a327551e-2606-497f-9db9-afacb99ee5e3
- In Finnish: Strategy of North Karelia, Growth package for forest bioeconomy, Climate and Energy Program 2030 (related to both before-mentioned documents in English)

Meet the actors

In this section, different actors from the North Karelian forest bioeconomy ecosystem are presented in ten different categories (Figure 7): 1) Industrial clusters, 2) Leading companies, 3) Research and technological centres, 4) Bioeconomy education and training, 5) Public agencies supporting forest bioeconomy, 6) Accelerators and incubators, 7) Investors and venture capitalist companies, 8) Start-ups and tech SMEs, 9) Events and 10) Forest- or innovation-related information sources.

Figure 7: Preview of the North Karelian forest bioeconomy innovation ecosystem

1. Industrial clusters

There are a variety of clusters present in North Karelia's forestry and wood sector. They have different geographic scopes: from the Joensuu area up to Europe. The clusters also vary in their thematic focus. All the identified clusters are linked to regional research centres and/or universities. A regional cluster for forest owners does not exist in North Karelia.

WoodJoensuu	woodJoensuu
Description	Joint platform for wood construction and wood materials presents events, research and projects in the Joensuu area. WoodJoensuu also presents new wooden buildings. They are strongly linked to the *BioPartners* network (UEF, LUKE and Karelia University of Applied Sciences) on wood construction and wood material sciences, but they are also supported by other R&D-organisations and the City of Joensuu.
Location	Joensuu
Geographic scope	Joensuu area
Thematic focus	Wood construction; Mechanical wood processing; Pulp processing and products; Wood-based bioproducts
Members	Companies in the wood construction and wood material sectors
Website	https://woodjoensuu.fi/en/front-page/
Contact	Only contact information related to Biopartners available: https://woodjoensuu.fi/en/network/

Green Hub	Green Hub
Description	Regional forest bioeconomy knowledge cluster for boosting cooperation between companies and R&D organisations (UEF, LUKE, NKUAS, Riveria, SYKE, Business Joensuu, Forestry centre). Currently re-organising and strengthening the cluster's role in internationalisation in close cooperation with the European Forest Institute.
Location	Joensuu
Geographic scope	North Karelia
Thematic focus	Forest bioeconomy
Members	
Website	https://www.greenhub.fi/
Contact	https://www.greenhub.fi/yhteystiedot

European Bioeconomy University (EBU)	european bioeconomy university
Description	Alliance of the six leading European Universities in the Bioeconomy field: Agro ParisTech, BOKU, UEF (University of Eastern Finland), UHOH, UniBo, WUR.
Location	c/o University of Hohenheim, Office of International Affairs, Franziska Schenk, 70593 Stuttgart, Germany

Geographic scope	Europe
Thematic focus	Bioeconomy
Members	
Website	https://european-bioeconomy-university.eu/
Contact	ebu@ua.uni-hohenheim.de; +49 711 459 22020

ERIAFF	ERIAFF network European Regions for Innovation in Agriculture, Food and Forestry
Description	The European Region for Innovation in Agriculture, Food and Forestry (ERIAFF) network. The initiative started with a core group of 17 European Regions, led by the Regional Government of Tuscany. ERIAFF reached the aggregation of 43 Regions from 13 EU Member States.
Location	Brussels (Rond Point Schuman, 14, 1040 Brussels)
Geographic scope	European Union
Thematic focus	Innovation in agriculture, food and forestry
Members	European Regions
Website	http://www.eriaff.com/
Contact	+3222868564; info@eriaff.com

Bioregions Facility	BIOREGIONS Forest bioeconomy in action
Description	The European Forest Institute, together with those regions willing to take the lead, established a Bioregions Facility to support the development of the forest bioeconomy. The Bioregions Facility supports innovation, networking, and policy learning, and develops joint strategies and actions, capacity building, plus partnering and exchanging experiences around: Innovation, Institutions, Infrastructures and Investments. The facility is also developing a European-wide Bioeconomy Acceleration Programme.
Location	Joensuu (Yliopistokatu 6, 80100 Joensuu)
Geographic scope	Europe
Thematic focus	Forest-based circular bioeconomy
Members	Regions that want to develop their forest bioeconomy
Website	https://efi.int/projects/bioregions-facility
Contact	giuseppe.tripodi @ efi.int

Wood Hub	
Description	A research, development, and service platform on wood construction and wood products. Wood Hub wants to be an acknowledged and sought after expert partner in wood construction and wood product-related RDI across Europe.
Location	
Geographic scope	Europe
Thematic focus	Wood construction and wood products
Members	Karelia UAS, University of Eastern Finland, LUKE, EFI, XAMK
Website	
Contact	

2. Leading companies

Within the North Karelian metal industry, the forest machinery and timber logistics sector plays an important role, comprising the biggest forest machine manufacturing hub in the world. The world leading Cut-to-Length (CTL) machine producer **JohnDeere** is accompanied by strong forest technology brands like **Mantsinen, Waratah** and **Kesla**. Forest industry consists of **StoraEnso Enocell** pulpmill, **Pankaboard** packaging mill and versatile mechanised wood processing industry. The region has four large sawmills (StoraEnso in Uimaharju, **Binderholz** in Nurmes and LIeksa and **Kaivospuu** in Joensuu) and several small sawmilling, planing and other wood processing companies around the region. Engineered wood products are produced in **UPM** plywood factory in the city center of Joensuu and supported by LVL production in neighboring regions. The strong forest bioeconomy business cluster is completed with ICT companies (e.g., **Arbonaut** and **Bitcomp**) specialised in forest management and forestry digitalisation.

John Deere Forestry Oy	JOHN DEERE
Market segment	Machinery
Description	The world's biggest cut-to-lengths forest machine factory in Joensuu produces all the John Deere harvesters and forwarders.
Location	Joensuu (Peltolankatu 25, 80220 Joensuu)
Investor(s)	
Website	https://www.deere.fi/fi/index.html
Contact	+358 20 584166; https://www.deere.fi/fi/yhti%C3%B6mme/ota-yhteytt%C3%A4/

Mantsinen Group Oy	
Market segment	Machinery, logistic service
Description	Mantsinen provides its customers with efficient and safe solutions to bulk material handling. Mantsinen Group currently operates two business units - Logistic Services and Material Handling Machinery. They produce efficient and big material handling machines for bulk material in harbours, logistic terminals etc. They are specialised in the forest and steel industries.
Location	Liperi (Välikankaantie 3, 80400 Liperi, Finland)
Investor(s)	
Website	https://www.mantsinen.com/en/
Contact	https://www.mantsinen.com/en/contact-us/

Kesla Oy	
Market segment	Machinery
Description	Kesla is a machine engineering group specialised in the marketing and manufacturing of forestry and material handling technology. They produce cranes (for forest machines, tractors, industrial sites and recycling services), harvester heads and chippers.
Location	Joensuu (Kuurnankatu 24, 80100 Joensuu)
Investor(s)	
Website	www.kesla.com
Contact	+358 207 862 841; https://www.kesla.com/en/contact-information/contact-brochure-request/

Waratah OM Oy	
Market segment	Machinery
Description	John Deere Forestry and Outokumpun Metalli Oy established a company called Waratah OM, which specialises in the development and manufacture of harvester heads. Waratah OM is responsible for the product development, product support and final assembly of harvester heads sold under the John Deere and Waratah brands, including electrical and hydraulic installations.
Location	Joensuu (Rahtikatu 14, 80100 Joensuu, Finland)
Investor(s)	

Website	https://www.outokummunmetalli.fi/yritys/waratah-om-oy
Contact	https://www.outokummunmetalli.fi/yritys/waratah-om-oy

Konepaja Antti Ranta Oy	LIPE
Market segment	Machinery
Description	Konepaja Antti Ranta Oy is specialised in production of LIPE hydraulic trailers for transportation of free-flowing goods. Their trailers are commonly used for wood chip and peat logistics.
Location	Liperi (Pajapolku 10, 80400 Liperi, Finland)
Investor(s)	
Website	http://www.anttiranta.com/en/front+page/
Contact	+358 (0) 207 210 900; http://www.anttiranta.com/en/contacts/

Veekmas Oy	VEEKMAS OY TIEHÖYLÄT
Market segment	Machinery
Description	Veekmas is the only grader manufacturer in the Nordic countries and a pioneer in grader technology, specialising in grader design, manufacturing and product development. Their motor graders are used for road maintenance and in the mining industry.
Location	Tolosenmäki (Tolosentie 3, 82380 Tolosenmäki)
Investor(s)	
Website	https://www.veekmas.fi/en/
Contact	0500 225 500; veekmas@veekmas.fi

Pentin Paja Oy	PP PENTIN PAJA Oy
Market segment	Machinery
Description	Pentin Paja is specialised in developing and manufacturing of machinery and equipment for small wood handling. The company sells over 10 different models of stroke harvesters, felling heads, energy wood heads, and uprooters under the Naarva brand name.
Location	Joensuu (Pamilonkatu 30, FI-80130 Joensuu)
Investor(s)	
Website	https://www.pentinpaja.fi/en/front+page/

Contact	+358 (0)13 825 051; info@pentinpaja.fi

StoraEnso Ltd.	
Market segment	Pulp & paper
Description	Stora Enso develops and produces solutions based on wood and biomass for a range of industries and applications worldwide, leading in the bioeconomy and supporting their customers in meeting demand for renewable eco-friendly products. In Uimaharju, North Karelia, they have the Enocell Mill that produces softwood pulp and dissolving pulp. The pulpmill is integrated with the Stora Enso Uimaharju sawmill.
Location	Uimaharju (Uimaharjun tehtaantie 2, FI-81281 Uimaharju, Finland)
Investor(s)	
Website	https://www.storaenso.com/ https://www.storaenso.com/en/about-stora-enso/stora-enso-locations/enocell-mill
Contact	+358 204 61 22

Pankaboard Ltd	
Market segment	Pulp & paper
Description	Pankaboard produces special cartonboards for packaging of food, healthcare, cosmetics etc..
Location	Pankakoski (Pankakoski Mill Oy: Ruukintie 2, 81750 Pankakoski)
Investor(s)	
Website	www.pankaboard.com
Contact	https://www.pankaboard.com/contact/; +358 (0) 104 804 600

UPM Plywood Oy	
Market segment	Wood processing
Description	UPM produces plywood using birch in a mill in the centre of the City of Joensuu.
Location	Joensuu (UPM Joensuu Plywood Mill, Sirkkalantie 17, FI-80100 Joensuu, Finland)

Investor(s)	
Website	https://www.wisaplywood.com/ https://www.upm.com/businesses/upm-plywood/
Contact	+358 2041 5133; plywood@upm.com

Binderholz Nordic Oy	binderholz
Market segment	Wood processing
Description	Binderholz is a leading European company for solid wood products and innovative construction solutions. Binderholz has 14 locations, of which 2 are large sawmills in North Karelia, Finland. In North Karelia, processing includes planing and glulam production.
Location	Joensuu Science Park (Office 533 Building 4A, Länsikatu 15, 80110 Joensuu); Lieksa (Keväniementie 7, 81700 Lieksa); Nurmes (Sahaportti 1, 75500 Nurmes)
Investor(s)	
Website	https://www.binderholznordic.fi/
Contact	metsa@binderholz.com; 020 7871 780; https://www.binderholznordic.fi/yhteystiedot

Kaivospuu	KAIVOSPUU
Market segment	Wood processing
Description	Kaivospuu's production consists of sawing pine and spruce with a total production volume of 85,000 – 90,000 m^3 per year. The company is specialised in the production of ecological products in both types of wood. The log lengths of pine and spruce are 3.1m and 4.3m.
Location	Hammaslahti (Puumestarintie 20, 82200 Hammaslahti)
Investor(s)	
Website	https://www.kaivospuu.fi/en/
Contact	https://www.kaivospuu.fi/en/yhteystiedot/

Iivari Mononen Group Oy	IIVARI MONONEN

Market segment	Wood processing
Description	Family-owned business specialised in impregnated timber products for infrastructure construction (Scanpole Ltd: electric and poles, fencing etc.), outdoor construction products (PrimaTimber) and services for electric and telecommunications networks (Exsane Ltd.). Company has production units also in Norway, Sweden and the UK.
Location	Joensuu (Rantakatu 25 C, 80100 Joensuu)
Investor(s)	
Website	https://www.iivarimononen.fi/en/
Contact	+358 20 733 0500; https://www.iivarimononen.fi/yhteystiedot/

Oy Arbonaut Ltd	arbonaut
Market segment	Forestry4.0
Description	Arbonaut developed the first forest inventory tools in the world that detect individual trees from aerial and satellite imagery and, ever since, combine the latest natural resource measurement technology with remote sensing data for operation resource management and planning. Many of the world's largest timber owners rely on Arbonaut's ArboLiDAR remote sensing technology for effective forest inventory.
Location	Joensuu (Kaislakatu 2, 80130 Joensuu, Finland)
Investor(s)	
Website	https://www.arbonaut.com/en/
Contact	+358 44 555 4434; https://www.arbonaut.com/en/contact

Bitcomp Oy	BITCOMP
Market segment	Forestry4.0
Description	Bitcomp has been making challenging geographic information systems for more than 20 years. Bitcomp was founded in 1990 and the majority of their work originally focused on designing calculation programmes for agricultural support systems, as well as engineering software for plant production. In 2004, Bitcomp started to focus on the forestry sector, while still being active in the agricultural sector.
Location	Joensuu (Siltakatu 12 A, 80100 Joensuu); Jyväskylä (Postiosoite Yliopistonkatu 38, 40100 Jyväskylä); Seinäjoki (Alaseinäjoenkatu 1, 60220 Seinäjoki); Vimpeli (Lakaniementie 85, 62800 Vimpeli)
Investor(s)	
Website	https://bitcomp.com/

Contact	+358 400 731 127; info@bitcomp.fi

Green fuel Nordic Oy	
Market segment	Bioenergy
Description	Green Fuel Nordic is a biorefining company. They use innovative, commercially-used pyrolysis technology in the production of an advanced bio-oil. They use renewable, domestic forest biomass as their resource.
Location	Lieksa (Talttatie 10, 81700 Lieksa)
Investor(s)	
Website	https://www.greenfuelnordic.fi/en
Contact	+358 40 7076640; timo.saarelainen@greenfuelnordic.fi

Lunawood	
Market segment	Thermally modified wood
Description	Lunawood Ltd is an innovative pioneer in the thermal modification of wood and has grown to be the global Thermowood® market leader.
Location	Mill in Hammalahti (head office in Lahti)
Investor(s)	
Website	https://lunawood.com/
Contact	+358 (0)44 797 5012, info@lunawood.com

3. Research centres and technological centres

Two nationwide research centres, LUKE and SYKE, have an office in Joensuu. There are also two universities that offer courses and study programmes in forestry and that have important research groups related to the forest bioeconomy. The European Forest Institute has its headquarters in Joensuu.

Natural Resources Institute Finland (LUKE)	
Description	LUKE provides new solutions towards the sustainable development of the Finnish bioeconomy and the promotion of new biobased businesses. The Joensuu office

	coordinates e.g. the Finnish National Forest Inventory and harvesting & logistics research in LUKE.
Location	HQ in Helsinki; Office in Joensuu (Yliopistokatu 6 B, 80100 Joensuu)
Geographic scope	Finland
Thematic focus	Bioeconomy and sustainable use of natural resources
Support to…	
Website	https://www.luke.fi/en/
Contact	Search for experts: Experts - Luonnonvarakeskus (luke.fi)

University of Eastern Finland (UEF)	UNIVERSITY OF EASTERN FINLAND
Description	UEF has four faculties: the Philosophical Faculty, the Faculty of Science and Forestry, the Faculty of Health Sciences, and the Faculty of Social Sciences and Business Studies. Its campuses are located in Joensuu and Kuopio. It is one of the two research universities in Finland that offers a forestry degree. UEF is specialised in e.g. forest modeling, forest inventory & management, biodiversity & forest health and wood material science. The university has notable experience in coordinating international Master's programmes. They have a research group on Forests and the Bioeconomy. Also, they have an international photonics research hub with a strong emphasis on forestry sector applications.
Location	Joensuu Campus (Yliopistokatu 2, FI-80100 Joensuu, Finland)
Geographic scope	International
Thematic focus	Research groups on Photonics and Forests & Bioeconomy.
Support to…	
Website	https://www.uef.fi/en
Contact	https://www.uef.fi/en/contacts

Karelia University of Applied Sciences (UAS)	Karelia University of Applied Sciences
Description	University of Applied Sciences offers a degree in forestry and has strong experience in bioenergy & heat entrepreneurship. In construction engineering it has strong knowledge in wood construction and smart energy systems.
Location	Joensuu (Tikkarinne 9, 80200 Joensuu)
Geographic scope	International

Thematic focus	
Support to…	
Website	https://www.karelia.fi/en/front-page/
Contact	+35813 260 600; info@karelia.fi; admissions@karelia.fi

European Forest Institute (EFI)	EFI
Description	The European Forest Institute is an international organisation, established by European States. The Headquarters are located in Joensuu. EFI conducts research and provides policy support on issues related to forests. They facilitate and stimulate forest-related networking and promote the dissemination of unbiased and policy-relevant information on forests and forestry.
Location	HQ in Joensuu (Yliopistokatu 6, 80100 Joensuu)
Geographic scope	Europe
Thematic focus	Bioeconomy, governance, resilience
Support to…	
Website	https://efi.int/
Contact	+358 10 773 4300; https://efi.int/staff-list

Finnish Environment Institute (SYKE)	SYKE
Description	A multidisciplinary research organisation focusing on issues having an impact on the environment. The Joensuu office concentrates on sustainable use of natural resources, biodiversity and ecosystem services.
Location	Joensuu (Yliopistokatu 6 B (Metla House), 80100 Joensuu)
Geographic scope	Finland
Thematic focus	Sustainable use of natural resources, biodiversity and ecosystem services
Support to…	
Website	www.syke.fi
Contact	http://wwwp.ymparisto.fi/scripts/hapa/h.asp?Method=USERSEARCHFORM&txthaku=&txtlang=FI&txtofficeid=81&txtorgid=10; 0295 251 000

4. Bioeconomy education and training

North Karelia is a relevant place to enjoy forest bioeconomy training. Two universities provide studies related to the forest bioeconomy.

University of Eastern Finland (UEF)	UNIVERSITY OF EASTERN FINLAND
Description	UEF has four faculties: one of them is the Faculty of Science and Forestry. Its campuses are located in Joensuu and Kuopio. It is specialised in forest modelling, forest inventory & management, biodiversity & forest health and wood material science. Also, it has an international photonics research hub with strong emphasis on forestry sector applications.
Location	Joensuu Campus (Yliopistokatu 2, FI-80100 Joensuu, Finland)
Thematic focus	Forestry, wood material science, photonics, etc.
Website	https://www.uef.fi/en
Contact	https://www.uef.fi/en/contacts

Karelia University of Applied Sciences (UAS)	Karelia University of Applied Sciences
Description	University of Applied Sciences offers a degree in forestry and has strong experience in bioenergy & heat entrepreneurship. In construction engineering it has strong knowledge in wood construction and smart energy systems.
Location	Joensuu (Tikkarinne 9, 80200 Joensuu)
Thematic focus	Forestry, bioenergy, wood construction, etc.
Website	https://www.karelia.fi/en/front-page/
Contact	+35813 260 600; info@karelia.fi; admissions@karelia.fi

5. Public agencies supporting forest bioeconomy

Public agents focused on forestry, entrepreneurship and the job market were identified.

Business Joensuu Oy	BUSINESS JOENSUU | JOE WITH
Description	Business Joensuu offers services for businesses, entrepreneurs and investors within the region to support their development. They provide solid expertise and knowledge about networks, local conditions, and opportunities.

Location	Joensuu (Länsikatu 15, FI-80110 Joensuu, Finland)
Geographic scope	Joensuu region
Thematic focus	New business; business growth; internationalisation and investment
Support	
Website	https://www.businessjoensuu.fi/en/
Contact	https://www.businessjoensuu.fi/en/contacts/; +358 10 419 8000; info@businessjoensuu.fi

Finnish Forest Centre	metsäkeskus
Description	Metsakeskus.fi is the online service of the Finnish Forest Centre. The Finnish Forest Centre is responsible for Metsakeskus.fi's technical development. The service is aimed at forestry operators and forest owners, as well as others interested in the forest.
Location	Lahti (Kauppakeskus Trio (6th floor), Aleksanterinkatu 18 A, Lahti)
Geographic scope	Finland
Thematic focus	Forest ownership; forest services; etc.
Support	
Website	https://www.metsakeskus.fi/ https://www.metsaan.fi/en
Contact	asiakastuki@metsakeskus.fi; 029 432 400

North Karelia Regional Council	Regional Council of NORTH KARELIA
Description	The Regional Council of North Karelia is responsible for regional planning and general coordination of regional development programs related to national and EU structural funds. The Council oversees the interests of the people, municipalities, organisations and enterprises and speaks on their behalf regarding both national and international questions.
Location	Joensuu (Pielisjoki Castle, Siltakatu 2, FI-80100 Joensuu)
Geographic scope	North Karelia
Thematic focus	
Support	North Karelians
Website	https://www.pohjois-karjala.fi/fi/web/english/regional-council

Contact	+358 13 267 4700; kirjaamo@pohjois-karjala.fi

Luotsi	
Description	Luotsi aims to support students, job-seekers, entrepreneurs, and businesses by providing them with career and business coaching, contact development and networking, recruiting, and other counselling needs. Luotsi is determined to help you with all of the above, and more. Their job agents "duuniagentit" offer free individual coaching for Joensuu residents.
Location	Joensuu (Kauppakatu 29, Joensuu)
Geographic scope	Joensuu
Thematic focus	Jobs
Support	Joensuu residents
Website	https://luotsijoensuu.fi/in-english
Contact	luotsi@joensuu.fi; 050 470 6553

6. Accelerators and incubators

Not many accelerator programmes were identified. Business Joensuu is a Bioregions partner and provides many services.

Business Joensuu	
Description	Business Joensuu offers services to companies, entrepreneurs, innovators and investors in the Joensuu region.
Location	Joensuu (Länsikatu 15, FI-80110 Joensuu, Finland)
Geographic scope	Joensuu region
Thematic focus	Not restricted, but specialised on forest bioeconomy, photonics and ICT services
Funding	They help their customers with finding investments. Close cooperation with Start Up Development Fund Joensuu.
Website	https://www.businessjoensuu.fi/en/
Contact	https://www.businessjoensuu.fi/en/contacts/

Draft	Draft
Description	Draft Program provides businesses and entrepreneurs the opportunity to make small-scale experiments and develop business ideas without bureaucracy.
Location	In Joensuu the program is managed by Karelia University of Applied Sciences (UAS) and in Kuopio by Savonia UAS.
Geographic scope	Draft Program is available for students and staff of Karelia UAS, University of Eastern Finland, Riveria, Savonia UAS and Savo Consortium for Education.
Thematic focus	
Funding	Up to €4000 for testing your business idea
Website	https://www.draftprogram.com/en/draft-info-en/
Contact	For University of Applied Sciences: draft@karelia.fi / heikki.immonen@karelia.fi; For University of Eastern Finland: irina.lavikainen@uef.fi; For others see bottom of website

Regional business consultation services	PIKES (Pielinen Karelia Development Centre Ltd), KETI (Central Karelia Development Company Ltd), LieKe (Lieksa Development Company Ltd)
Description	Regional business promotion and development companies offering consultation services to entrepreneurs.
Location	Multiple
Geographic scope	North Karelia
Thematic focus	Any
Funding	Municipalities
Website	https://www.pikes.fi/en/web/eng/home & https://www.keti.fi/en/web/keti-en & https://www.lieksankehitys.fi/home
Contact	https://www.pikes.fi/en/yhteystiedot; keti@keti.fi; info@lieksankehitys.fi

7. Investors and venture capitalist companies

Three of the identified investors operate in Finland; one focuses on North Karelia and another one on Joensuu. Both investment entities with smaller geographic scope also have a more focused thematic scope and prefer to invest in digitalisation, technology and forest & bioeconomy (e.g. photonics) start-ups.

North Karelia Growth Fund	NORTH KARELIA GROWTH FUND

Description	North Karelia Growth Fund invests in recently established and young companies from the region, particularly in the sectors of digitalisation, forest and bioeconomy, photonics, travel and creative industries, and material sciences. The fund is managed by Redstone.
Location	Managed by Redstone VC, they have an office in Helsinki (Melkonkatu 26, 00210 Helsinki,Finland)
Geographic scope	North Karelia
Thematic focus	Digitalisation; forest and bioeconomy; photonics; travel and creative industries; and material sciences
Investment	Typical investment during the first round is €25-150k in equity and including follow-on investments up to €500k. To qualify for investment, your start-up will need to be domiciled in the region or otherwise have significant operations in the region - with a team that is capable of building scalable international business.
Website	https://www.northkareliafund.com/ https://www.redstone.vc/sector_funds/North Karelia-growth-fund-fundraising/
Contact	Contact form: https://www.northkareliafund.com/contact

Start Up Development Fund Joensuu	STARTUP DEVELOPMENT JOENSUU -INVESTMENT FUND
Description	This €2.5 million regional fund makes €50k-200k co-investments for start-ups having or starting business in Joensuu region. Operating in close cooperation with Joensuu Business Accelerator and internationalisation services, the fund supports the domestic and international growth of portfolio companies. The fund is the gateway to a second round of funding.
Location	Business Joensuu Oy (Länsikatu 15, 80110 Joensuu)
Geographic scope	The target companies must operate in Joensuu, wish to be located in Joensuu or have a connection to the Joensuu region at the level of operational activities.
Thematic focus	There are no industry restrictions, the main focus is on entrepreneurship related to digitalisation, forest and circular bioeconomy, and new technologies and materials.
Investment	Typically €50,000 to €200,000
Website	https://www.businessjoensuu.fi/yrityspalvelut/yritystoiminnan-aloittaminen/start-up-rahasto-joensuu/
Contact	Harri Palviainen (+358 500 967 744; harri.palviainen@businessjoensuu.fi)

FiBAN – Finnish Business Angels Network	FiBAN FINNISH BUSINESS ANGELS NETWORK

Description	Finnish Business Angels Network (FiBAN) is a non-profit association of private investors on a mission to inspire private investments. The network is one of the largest and most active business angel networks in Europe with over 650 approved members. They have a frequent cooperation with Joensuu Business Accelerator to give start-ups an opportunity to pitch for potential business angel investors.
Location	Helsinki (Maria 01, Lapinlahdenkatu 16, 00180 Helsinki, Finland)
Geographic scope	Finland
Thematic focus	Potential high-growth companies
Investment	
Website	https://fiban.org/
Contact	Info@fiban.org

Finnvera	FINNVERA
Description	Finnvera provides financing for the start, growth and internationalisation of enterprises and guarantees against risks arising from exports. Finnvera strengthens the operating potential and competitiveness of Finnish enterprises by offering loans, domestic guarantees, export credit guarantees and other services associated with the financing of exports. The risks included in financing are shared between Finnvera and other providers of financing.
Location	HQ Helsinki (Porkkalankatu 1, PL 1010, 00101 Helsinki) and HQ Kuopio (Kallanranta 11, PL 1127, 70111 Kuopio). Office in Joensuu (Länsikatu 15, rakennus 3 B, 80110 Joensuu)
Geographic scope	Finland
Thematic focus	
Investment	https://www.finnvera.fi/eng/growth/investments
Website	https://www.finnvera.fi/eng
Contact	https://www.finnvera.fi/eng/contact-us/send-a-message

Business Finland	BUSINESS FINLAND
Description	Business Finland is the Finnish government organisation for innovation funding and trade, travel and investment promotion.
Location	Helsinki (Porkkalankatu 1, Helsinki). 40 offices globally and 16 regional offices in Finland
Geographic scope	International
Thematic focus	
Investment	

Website	https://www.businessfinland.fi/en
Contact	+358 29 50 55000; https://expertsearch.businessfinland.fi/#/search

8. Start-ups and tech SMEs

8.1 Forest bioeconomy companies

North Karelia has a very active forest bioeconomy start-up ecosystem compared to its population size. Several North Karelian start-ups and SMEs function in the wood processing market segment. In addition, there are several wood construction start-ups and SMEs. Two forestry services companies and two non-wood forest product companies were also identified.

Liperin Höyläämö Ky	
Market segment	Wood processing
Description	Liperin Höyläämö Ky is a pioneer in the industrial production of white-waxed panels. Today, the total annual capacity of Liperin Höyläämö's two production lines is more than 20,000 m^3 of high-quality exterior and interior panels. About 90% of the company's products are exported, and the family company employs 10 people.
Location	Liperi (Heinävedentie 146, 83100 Liperi)
Accelerator(s)	
Investor(s)	
Website	https://www.liperin.fi/main.site?action=siteupdate/view&id=2&set_language=eng
Contact	https://www.liperin.fi/main.site?action=siteupdate/view&id=18

Puuartisti Oy	
Market segment	Wood processing
Description	Puuartisti is a wood processing company designing and manufacturing unique furniture, furniture collections and solid wood interior fittings.
Location	Kontioranta (Huoltotie 3, 20790 Kontioranta)
Accelerator(s)	
Investor(s)	
Website	https://puuartisti.fi/en/
Contact	+358505690581; miikka@puuartisti.fi; https://puuartisti.fi/en/contact-us/

Akvila Cultery	
Market segment	Wood processing
Description	Akvila Cutlery is a newly established (2020) Finnish company which manufactures and develops unique ecological reusable wood fibre cutlery. Their raw material is made from softwood fibres and wood waste-derived ISCC certified bio-polypropylene, utilising residues from existing pulp production.
Location	Outokumpu (Kuvernöörinkatu 7, 83500 Outokumpu, Finland)
Accelerator(s)	
Investor(s)	
Website	https://www.akvila.com/
Contact	https://www.akvila.com/contact-2/

Kupilka	
Market segment	Wood processing
Description	Kupilka produces eco dishware & survival gear (plates, cups, cutlery) from wood.
Location	Kontiolahti (Lukantie 6, FI-80770 Kontiolahti)
Accelerator(s)	
Investor(s)	
Website	https://kupilka.fi/en/
Contact	https://kupilka.fi/en/contact

Karelia Ikkuna	
Market segment	Wood products
Description	Karelia Ikkuna manufactures energy efficient windows fit for highly demanding Nordic conditions. The company's made-to-measure products are manufactured in North Karelia. The company's products bring together Finnish pine, energy efficient glass and weatherproof powder-coated aluminium.
Location	Hammaslahti (Puumestarintie 31, 82200 Hammaslahti)
Accelerator(s)	
Investor(s)	
Website	https://www.kareliaikkuna.fi/yritys

Contact	013 120 266; karelia@kareliaikkuna.fi

EcoTelligent Oy	
Market segment	Wood construction; wood products
Description	EcoTelligent provides natural alternatives and low-carbon solutions for the visible technologies in the field of telecommunication. Examples are wooden telecommunication towers and intelligent poles.
Location	Ylämylly (Patteristontie 21, 80400 Ylämylly)
Accelerator(s)	
Investor(s)	EU Horizon 2020 funding
Website	www.ecotelligent.fi
Contact	Matti Pölönen (CTIO, +358 50 548 7788, Matti@ecotelligent.fi) & Gyöngyi Mátray (CEO, +358 50 355 0905, gm@ecotelligent.fi)

Aatelitalo Oy	
Market segment	Wood construction
Description	Aatelitalo is a modern housebuilding factory, specialised in prefabricated house construction.
Location	Lehmo (Hirsikankaantie 1, 80710 Lehmo)
Accelerator(s)	
Investor(s)	
Website	https://aatelitalo.fi/
Contact	info@aatelitalo.fi; https://aatelitalo.fi/ota-yhteytta/yhteystiedot/

Timber Bros Oy	
Market segment	Wood construction
Description	Timber Bros is an engineering firm specialising in wood construction, with strong experience in wood construction design ranging from prefabricated factories to industrial builders as well as unique detached house projects.

Location	Joensuu Science Park (Alasintie 3, 80130 Joensuu)
Accelerator(s)	
Investor(s)	
Website	https://timberbros.fi/
Contact	https://timberbros.fi/yhteystiedot/

Olotar	olotar
Market segment	Wood construction
Description	Olatar builds wooden yard buildings that serve as kitchens, pergolas, storage rooms and saunas.
Location	Oravisalo (Oravisalontie 1150, 82310 Oravisalo)
Accelerator(s)	
Investor(s)	
Website	https://olotar.fi/
Contact	+358 400 186159; info@olotar.fi

Karelwood Oy	Karelwood
Market segment	Forestry services
Description	Karelwood provides forestry services like timber harvesting, forestry advice, forest reforming etc. They respond to the needs of modern logging companies.
Location	Eno (Niskantie 44, 81200 Eno)
Accelerator(s)	
Investor(s)	
Website	https://karelwood.com/en
Contact	0408380358; info@karelwood.com

Rajaforest Oy	RAJAFOREST OY
Market segment	Forestry services

Description	They provide forest services such as timber harvesting and transportation.
Location	Kitee (Kiteentie 14 A, 82500 Kitee)
Accelerator(s)	
Investor(s)	
Website	https://rajaforest.fi/
Contact	040 154 4714; saara.pennanen@rajaforest.fi

Nordic Koivu	NORDIC KOIVU
Market segment	Non-wood forest products
Description	Producing birch sap for foods, drinks, cosmetics and pharmaceutical products.
Location	Tohmajärvi (Koivumahlatie 3, 82600 Tohmajärvi)
Accelerator(s)	
Investor(s)	Among others, Hong Kong based Windseeker Development Limited
Website	https://www.nordickoivu.fi/
Contact	+358 400 388 221, arto.korhonen@nordickoivu.com

Dalla Valle Oy	DALLA VALLE OY
Market segment	Non-wood forest products
Description	Dalla Valle is specialised in purchasing, processing and selling Finnish fresh and frozen wild mushrooms, both domestic and foreign markets.
Location	Sotkuma (Käsämäntie 5, 83750 Sotkuma)
Accelerator(s)	
Investor(s)	
Website	https://www.dallavalle.fi/en/home/
Contact	+358 (0)500 297 811

8.2 Companies with links to the forest bioeconomy

There are many construction companies that do not focus exclusively on wood construction, but have it as a part of their portfolio. Also, one technology company that is linked to Forestry4.0 is identified.

Kelluu Oy	KELLUU
Market segment	Forestry4.0
Description	Kelluu develops small, autopiloted airships (“mini zeppelins”) carrying sensors for collecting and transferring environmental and technical data. Kelluu airships are made from the most advanced materials on the market and can be loaded with 3 kilograms of any modern sensors. Then they continuously move or float in place, collect data and transfer it wherever needed.
Location	
Accelerator(s)	Business Joensuu
Investor(s)	
Website	www.kelluu.com
Contact	https://kelluu.com/contact/

Rakennustoimisto Eero Reijonen Oy	Rakennustoimisto EERO REIJONEN OY
Market segment	Wood construction
Description	Rakennustoimisto Eero Reijonen is a construction firm with their main business area in Eastern Finland. The company is a pioneer in wood construction and has gained a strong foothold as a builder in industrial, commercial and public construction projects.
Location	Liperi (Liperintie 125, 83100 Liperi)
Accelerator(s)	
Investor(s)	
Website	https://ereijonen.fi/
Contact	https://ereijonen.fi/yhteystiedot/

Arcadia Oy Arkkitehtitoimisto	ARCADIA
Market segment	Wood construction
Description	Arcadia is a nationwide Architect's Office. Their comprehensive design service includes school, retail and hospital construction. They are one of the largest players in Eastern Finland in housing design. The office's special expertise is compaction of the urban structure, data modelling and the latest wood construction technology. Arcadia Oy Arkkitehtitoimisto currently employs 12 designers and is the market leader in Eastern Finland in its field.

Location	Joensuu (Niskakatu 16 B, 80100 Joensuu) and Helsinki
Accelerator(s)	
Investor(s)	
Website	https://www.arcadia.fi/
Contact	arcadia@arcadia.fi, tel. +358 10 423 4280

Rakennustoimisto K. Tervo Oy	TERVO
Market segment	Wood construction
Description	Rakennustoimisto K. Tervo is a construction company. Professional staff and modern working methods guarantee sustainable development, high-quality implementation and occupational safety.
Location	Joensuu (Muuntamontie 2, 80100 Joensuu) and Kuopio
Accelerator(s)	
Investor(s)	
Website	https://www.rakentajatervo.fi/fi/
Contact	https://www.rakentajatervo.fi/fi/?page_id=2111

Insinööritoimisto Kantelinen Oy	Kantelinen INSINÖÖRITOIMISTO
Market segment	Wood construction
Description	They offer their customers professional structural and element design in the Eastern Finland region. Their operations are based on decades of experience, and bold adoption of new knowledge.
Location	Joensuu (Jokikatu 7 A 39, 80220, Joensuu)
Accelerator(s)	
Investor(s)	
Website	https://www.kantelinen.fi/
Contact	ville.kantelinen@kantelinen.fi

Architects Lappalainen & Korjonen Oy	Arkkitehtitoimisto lappalainen & korjonen oy

Market segment	Wood construction and Architecture
Description	Architects Lappalainen & Korjonen have accumulated know-how for more than 35 years. Their best-known design projects are Hotel OnnenTähti in Tuuri and Kerubi Stadium in Joensuu.
Location	Joensuu (Kauppakatu 15 A 2nd floor, 80100 Joensuu)
Accelerator(s)	
Investor(s)	
Website	https://www.arktoimisto.fi/
Contact	https://www.arktoimisto.fi/lomake.html?id=39107

Insinööritoimisto KJ Oy	INSINÖÖRITOIMISTO KJ OY
Market segment	Wood construction
Description	Insinööritoimisto KJ provides different services for the construction sector. They provide design services, supervision and work management, carbon footprint calculation of construction projects and information modelling services.
Location	Joensuu (No office yet)
Accelerator(s)	
Investor(s)	
Website	https://instokj.fi/
Contact	+358 44 972 7738; toimisto@instokj.fi

Hermannin Viinitila	Hermannin VIINITILA
Market segment	Non-wood forest products
Description	Produces beverages from forest berries under the names Hermannin Viinitila and Nordic Premium Beverages. Nordic Premium Beverages is producing award-winning Arctic Blue Gin.
Location	Ilomantsi (Käymiskuja 1 82900 Ilomantsi)
Accelerator(s)	
Investor(s)	
Website	https://hermannin.fi/ and https://nordicpremiumbeverages.com
Contact	+358 (0)207 789 230; info@hermannin.fi

9. Events

9.1 Entrepreneurship events

Two entrepreneurship events are listed, one is focused on Joensuu and one on Finland.

Big Part	
Description	Big Part is Joensuu Entrepreneurship Society's biggest event during the spring.
Location	Joensuu (Länsikatu 15, Joensuu)
Geographic scope	
Theme	Entrepreneurship
Website	https://joensuues.fi/
Contact	Chair: niko.lindfors@joensuues.fi

Slush start-up event	SLUSH
Description	A gathering of more than 20,000 people, including thousands of start-ups and investors, organised in Helsinki.
Location	Helsinki
Geographic scope	Finland (and international)
Theme	
Website	https://www.slush.org/
Contact	https://www.slush.org/contact/

9.2 Bioeconomy events

Four interesting events related to the forest bioeconomy are listed. Their focus is varied, from photonics to wood construction.

Forest & Photonics	Photonics Finland
Description	International, annual workshop on digital forestry that is organised by *Business Joensuu*. They centre on combining new photonics and digital tools for solving problems in forestry and forest industries. The workshop comprises a matchmaking event for industry, research and technology providers, and a platform for meeting relevant start-ups.
Location	Joensuu (Länsikatu 15, 80101 Joensuu)
Geographic scope	Finland
Theme	Photonics

Website	https://www.photonics.fi/event/forestphotonics-2020-webinar/
Contact	https://www.photonics.fi/contact-us/

Drivers for Wood Construction	
Description	Conference / event organised by Karelia University of Applied Sciences
Location	Joensuu
Geographic scope	
Theme	Wood construction
Website	https://woodjoensuu.fi/drivers-for-wood-construction-2021-event/
Contact	

Karelia Symposium	
Description	Annual conference on wood material science, wood industry and wood construction organised by the University of Eastern Finland
Location	
Geographic scope	
Theme	Wood material science, wood industry and wood construction
Website	https://sites.uef.fi/karelia-symposium/
Contact	ossi.turunen@uef.fi

Koli Forum	KOLI forum
Description	Biennial conference on current forest bioeconomy issues and questions.
Location	Koli National Park, Lieksa, with Secretariat in Joensuu (Yliopistokatu 6 B, 80100 Joensuu)
Geographic scope	International
Theme	Forest bioeconomy
Website	https://koliforum.fi/koli-forum-association/
Contact	+358 50 337 2562; info@koliforum.fi

10. Forest- or innovation-related information sources

There are several information sources for forest bioeconomy entrepreneurs in North Karelia. Some focus on entrepreneurship, and others on forest bioeconomy: Business Joensuu combines both.

Joensuu Entrepreneurship Society (JoES)	JOES
Description	Joensuu Entrepreneurship Society (JoES) shares inspiration, supports networking, and organises events. They are a community that connects people with an entrepreneurial spirit.
Location	Joensuu
Geographic scope	Joensuu and surroundings.
Theme	Entrepreneurship
Website	https://joensuues.fi/
Contact	Chair: niko.lindfors@joensuues.fi

Business Joensuu Oy	BUSINESS JOENSUU | JOE WITH
Description	Business Joensuu offers services for businesses, entrepreneurs and investors within the region to support their development. They provide solid expertise and knowledge about networks, local conditions, and opportunities.
Location	Joensuu (Länsikatu 15, FI-80110 Joensuu, Finland)
Geographic scope	Joensuu region
Theme	New business, business growth, internationalisation and investment
Website	https://www.businessjoensuu.fi/en/
Contact	https://www.businessjoensuu.fi/en/contacts/ +358 10 419 8000; info@businessjoensuu.fi

Finnish Forest Centre	metsäkeskus
Description	Metsakeskus.fi is the online service of the Finnish Forest Centre. The Finnish Forest Centre is responsible for Metsakeskus.fi's technical development. The service is aimed at forestry operators and forest owners, as well as others interested in the forest.
Location	Lahti (Kauppakeskus Trio (6th floor), Aleksanterinkatu 18 A, Lahti)

Geographic scope	Finland
Theme	Forest ownership, forest services, etc.
Website	https://www.metsakeskus.fi/ https://www.metsaan.fi/en https://metsakeskus.maps.arcgis.com/apps/MapSeries/index.html?appid=3e2b8c3f85b747f0a39ad8261504cf0e
Contact	asiakastuki@metsakeskus.fi; 029 432 400

Forest.fi	forest.fi
Description	Forest.fi is an online magazine that provides news about forests and the forest sector in Finland.
Location	Helsinki (Salomonkatu 17 A, 00100 Helsinki)
Geographic scope	Finland
Theme	Forestry
Website	https://forest.fi/
Contact	info@forest.fi

Metsähallitus	METSÄHALLITUS
Description	Metsähallitus is a state-owned enterprise that produces environmental services for a diverse customer base; ranging from private individuals to major companies. They sustainably use, manage, and protect state-owned land and water areas and reconcile the different goals of owners, customers, and other stakeholders. Their website is a useful source of information for local forest actors.
Location	Vantaa (Ratatie 11, FI-01301 Vantaa)
Geographic scope	Finland
Theme	Environment
Website	https://www.metsa.fi/en/
Contact	+358 206 39 4000; kirjaamo@metsa.fi; https://www.metsa.fi/en/about-us/contact-us/

A1. Objectives and methodology

A1.1. Aim

This regional profile aims at providing a summarised economical portrait of North Karelia that would be of interest for international forest bioeconomy actors (*Introduction* chapter), and at capturing the current actors in the North Karelian forest bioeconomy ecosystem (*Meet the actors* chapter). Information on North Karelian clusters, leading companies, research and technological centres, bioeconomy education and training, public agencies, accelerators, investors, start-ups, events and information sources is provided. This information can be used to assess the focus of the North Karelian bioeconomy sector and to identify opportunities. The sections on accelerators and investors can provide very useful information to start-ups and tech SMEs in the forest bioeconomy sector.

A1.2. Methodology

Although the Bioregions Facility focusses on the forest bioeconomy, it is in the interest of the readers to have a broader scope and discover key figures of other sectors of the bioeconomy. When introducing the region, a general portrait of the regional economic activities and R&D specificities is presented. At the Bioregions Facility, we understand the bioeconomy not as a new, separate economic sector, but as a "biologisation" of existing economic activities and industrial sectors. In consequence, it is of crucial importance to know them, as they are the actors that could embrace the bioeconomy.

Currently, mainly actors – companies, clusters, research and technological centres, accelerators, investors, events, etc. – located inside North Karelia are included. In the future it might be interesting to include more actors that are not located in the region, but which have North Karelia as a part of their geographic field of work.

The actors presented in the *Meet the actors* chapter are grouped in ten categories. The first one presented is clusters. The second category is leading companies. The following categories are research & technological centres, bioeconomy education and training, public agencies supporting forest bioeconomy, accelerators, investors, start-ups & tech SMEs, events and information sources.

In the category start-ups and tech SMEs, we considered that a company is relevant when the company is related to or has a potential application in the forest bioeoconomy. All the identified companies which correspond to this requirement were subsequently divided into three sub-categories: *Forest bioeconomy companies, Companies with links to forest bioeconomy* and *Companies with future potential in forest bioeconomy*. The decision tree supporting this classification can be found in Figure 8. If the company's current focus is on forest bioeconomy, it is included in *Forest bioeconomy companies*. If the company has a certain product or service which is currently being applied to forest bioeconomy, it can be found under *Companies with links to forest bioeconomy*. If the company is currently not active in the forest bioeconomy but it has a product or service with the future potential to be implemented in forest bioeconomy, then the company is included in *Companies with future potential in forest bioeconomy*.

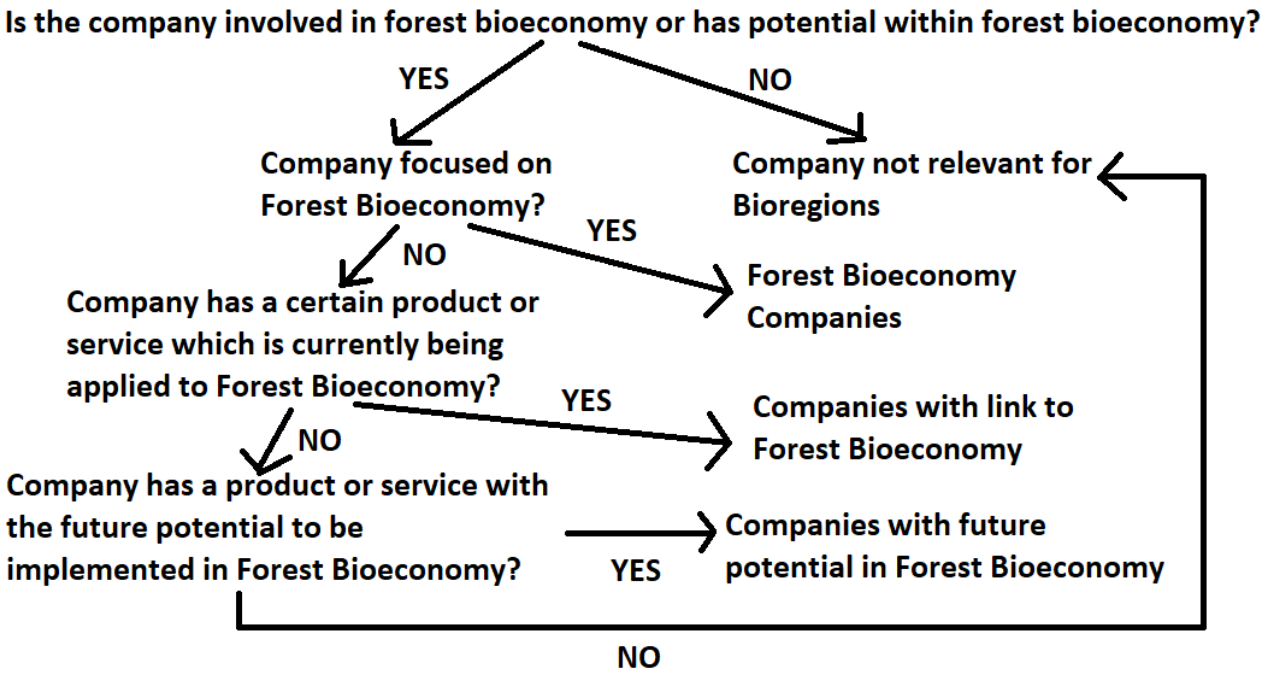

Figure 8: Decision tree to classify companies

Within all actor categories, actors can be found that are not only focused on the bioeconomy. We aimed to include the most relevant actors that can support leading companies, start-ups and tech SMEs that have the bioeconomy as part of their business model. Therefore, within categories such as accelerators, investors, events and information sources, we also included actors with activities applicable to the whole North Karelian entrepreneurship ecosystem, or centred around transversal technologies, including key enabling technologies.

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