

From forest side streams to market value: Biolat's CEforestry experience

- Interreg Baltic Sea Region project CEforestry (2023 - 2025) explores turning sawmill side streams into higher-value products without extra harvesting.
- This presentation showcases Biolat's role and achievements in transforming forest biorefinery products into market-ready ingredients for cosmetics, nutraceuticals, and pharmaceuticals.

Speaker: Ilona Vanaga, JSC "Biolat", Latvia

Event: CEforestry final event workshop, Uppsala, Sweden, 19 - 21 November 2025

*"Using what is already cut
as a quiet but effective form of nature protection"*



Timber, Prices and Pressure = Innovation Window

- Regionally, annual sawmill residues approach **1.48 billion kg dry bark** and **2.25 billion kg dry sawdust**. At a conservative 4% extraction yield, this resource could supply approximately **59 million kg of tannins per year** for industrial and water treatment applications.
- Forestry plays a crucial role in **Latvia's economy**, with forest-based exports reaching approximately **€3.3 billion (roughly 17% of total exports)**. However, recent years have brought significant challenges that create a compelling innovation window.

Volatile Pricing

Roundwood purchase prices have dipped and turned volatile - spruce and pine sawlogs dropped 14 - 17% in H2 2023 versus H1 2023, though conifer prices rose again in H2 2024 whilst deciduous prices fell.

Rising Costs

Regeneration costs increased by 6.5 - 19.3% and tending costs surged by 14.7 - 50.8% in 2023, squeezing operational margins across the sector.

Policy Constraints

New five-year felling quotas (from 2025) reduce maximum allowable felling by approximately 9.5% versus the previous period, limiting traditional volume-based strategies.

Implication: Margin pressure combined with reduced quotas creates a strong incentive to upgrade side streams into higher-value inputs rather than relying solely on energy applications.

Resource Base and Biorefinery Potential

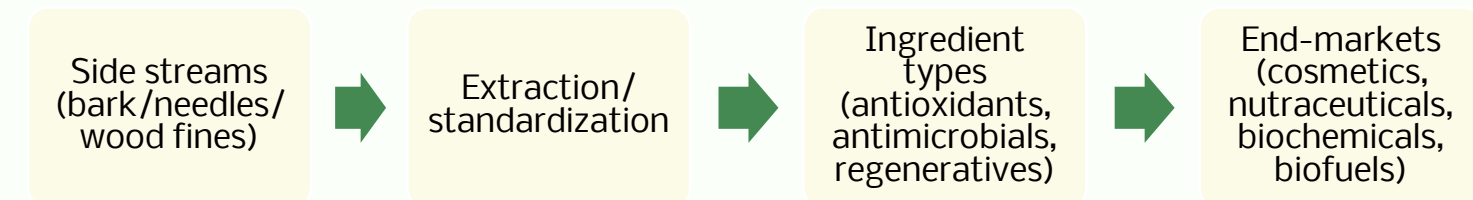


- Industrial-scale sawmill residues make **large-scale valorisation** both technically and economically meaningful.
- With 4% extraction efficiency, approximately **59 million kg of tannins per year** are feasible from regional bark and sawdust streams.

Co-location Benefits

- Cut logistics emissions by **up to 80%**
- Create **5-10 jobs per 10,000 tonnes processed**
- Reduce transportation costs and carbon footprint

Biorefinery



- Natural actives for skincare and personal care formulations
- Health-promoting ingredients for food supplements and functional foods
- Industrial compounds and specialty chemicals from lignin and extractives

Strongest market pull today centres on **cosmetic ingredients** and **food supplement ingredients**, where consumers actively seek natural, sustainably sourced, and circular alternatives.

Biolat's CEforestry work: objectives and approach

01

Map Demand

Identify demand for residue-derived ingredients across cosmetics, nutraceuticals, pharmaceuticals, and industrial sectors through structured stakeholder engagement.

02

Identify Barriers

Analyse obstacles and opportunities along the value chain, from extraction technology to market acceptance and regulatory compliance.

03

Develop Concepts

Translate demand signals into scalable business concepts including co-located extraction hubs and certification-ready processes.

04

Enable Partnerships

Equip Biolat with evidence-based materials to engage stakeholders and SMEs with step-by-step business models in Latvia and the wider Baltic Sea Region.

Approach: Our methodology combines structured stakeholder surveys, desk research, case studies on green extraction routes and conifer-based health products and value chain options for novel products.



About Biolat



- Latvian biotech (founded 1993)
We specialize in natural bioactives from conifers using green extraction
- **Core actives & products:** sodium chlorophyllin (Ho-Fi Original), Silbiol®/Silvasept, polyprenols - designed for cosmetics, nutraceuticals, pharma use-cases.
- **Role in CEforestry:** contribute market research, circular business approach, and extraction know-how to valorize needles, bark, cones into high-value ingredients.



- **Fit to today's demand:** our actives map to antioxidant, immunity, anti-inflammatory and regenerative claims sought by SMEs in cosmetics and food supplements.

Biolat's main achievements in CEforestry



Market Analysis

Delivered comprehensive market analysis for green forestry biomass side streams, including detailed case studies on SpruceSugar™ natural surfactant, Havupuu-uutejuoma Metsamustikka health drink, and Ho-Fi® Original spruce needle drink.



Stakeholder Survey

Conducted structured stakeholder survey to map demand, identify promising products, and understand perceived barriers across the value chain from production to market.



Business Concepts

Produced SWOT analyses and commercialisation concepts for key product examples, providing practical roadmaps for scaling from pilot to commercial production.



Knowledge Transfer

Prepared scientific posters, webinar talks, and evidence-based materials for dissemination, transforming stakeholder communication into data-backed product concepts.

SWOT analysis example: forest ingredients-based health drinks

Comparing Ho-Fi® Original & Havupuu-uutejuoma (conifer extract drink)

Two innovative conifer-based health drinks demonstrate the market potential for forest-derived functional beverages, each leveraging unique ingredient profiles and positioning strategies.



Ho-Fi® Original

Strengths

Spruce needle sodium chlorophyllin • Strong antioxidant profile • Natural detoxification properties • Renewable resource base

Weaknesses

Niche flavour profile • Limited market reach • Modest brand awareness • Consumer education required

Opportunities

Health-conscious beverage trends • E-commerce expansion • Functional drink market growth • Premium positioning

Threats

Crowded functional drink market • Health claim regulations • Shifting consumer trends • Retail competition

Havupuu-uutejuoma

Strengths

Pine extract with forest blueberries • Unique Nordic flavour • Strong antioxidant content • Natural ingredient story

Weaknesses

Limited distribution channels • Regional brand recognition • Consumer education needs • Scale-up challenges

Opportunities

Natural functional beverages • Targeted education campaigns • Online retail expansion • Wellness market alignment

Threats

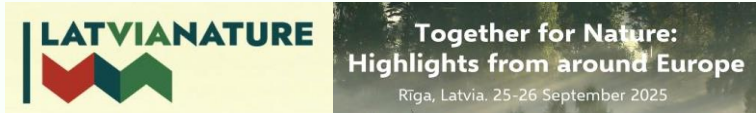
Market saturation risks • Regulatory complexity • Fast-moving trends • Established competitors

Both products demonstrate how forest biomass can be transformed into consumer-ready functional beverages, though success requires sustained investment in brand building, consumer education and distribution network development.

Dissemination Activities

CEforestry project findings have been actively disseminated through multiple channels, shifting the narrative from waste management to evidence-based product development backed by robust market intelligence.

Scientific Posters



From Forest Side Streams to Market Value: Biolat's Ceforestry Experience in Circular Bioeconomy

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INTRODUCTION

Ceforestry (2023–2025) explores how under-used sawmill side streams – bark, needles and sawdust – can be turned into higher value products without increasing harvesting pressure. Regionally, annual sawmill residues approach 1.48 billion kg dry bark and 2.25 billion kg dry sawdust; at a conservative 4 % extraction yield, this resource could supply ~59 million kg of tannins for industrial applications and water treatment each year. In parallel, Ceforestry analyses and case studies outline practical biorefinery chains and market pathways for residue derived ingredients. **Using what is already cut, in our view, is a quiet but effective form of nature protection: it reduces waste, lengthens the cascade of wood use, and supports rural jobs around existing mills.**

OBJECTIVES

- Map demand for residue derived ingredients across sectors and identify barriers and opportunities.
- Translate demand signals into scalable concepts (e.g., co located extraction hubs; certification ready processes).
- Equip Biolat with evidence based materials to engage mills/SMEs and shape first step business models in Latvia and the wider Baltic Sea Region.

MATERIALS & METHODS

We combined: (i) a structured stakeholder survey, desk research and literature review; (ii) case studies on green extraction routes and conifer-based health products; and (iii) synthesis of residue availability and value chain options for novel product development. Analyses covered market share indicators, technology readiness and regulatory bottlenecks, and place-based business models (e.g., co-location with large sawmills to cut logistics).

RESULTS

Resource base & scale
Fig. 1 assessment indicates industrial scale valorization. With 4 % extraction, ~59 million kg tannins per year are feasible. Co-locating extraction with larger sawmills reduces logistics emissions by up to 80 % and creates ~5–10 jobs per 10 000 t processed.

Demand signals
Surveyed "promising biorefinery products" are led by cosmetic ingredients (24.98 %), food supplements (20.78 %), and biopharmaceuticals (16.68 %) as shown in Fig. 2.

Barriers & enablers
Companies consistently cite high production costs, complex regulation, and technology readiness limits; at the same time, they point to certificate led branding, green extraction methods, and integrated biorefineries as credible openings.

CONCLUSIONS

- The Ceforestry experience demonstrates that forestry residues can be repositioned from waste to resource.
- For JSC "Biolat" the project has changed stakeholder communication to presenting evidence-based product concepts supported by market data.
- Market intelligence thus serves as both a conservation and economic development tool, enabling broader adoption of circular bioeconomy models.

REFERENCES

- Ceforestry Market Research Reports (Biolat, 2024).
- Interreg Baltic Sea Region: Ceforestry project (2023–2025): <https://interreg-baltic.eu/project/ceforestry/>

Fig. 1

Availability of Dry Bark and Sawdust in the Baltic Sea Region

Material	Availability (billion kg)
Dry bark	1.48
Dry sawdust	2.25

Fig. 2

Promising Consumer Products

Product Category	Percentage
Food supplements	31.2%
Biofuel	12.5%
Betulin	12.5%
Bioenergy products	12.5%
Cosmetics	31.2%

5th INTERNATIONAL CONFERENCE Old-growth forests: policy and practice

October 16 - 17, 2025
Pārupes iela 5, Jaunkalsnava, Latvia

Market Value from What We Already Cut: residues to products

Ilona Vanaga*, Zane Vārpiņa, Viesturs Vārpiņš, Aira Ulmane, JSC "Biolat", Salaspils, Latvia. *Corr. author: ilona.vanaga@biolat.lv

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RESULTS

Resource base & scale
Fig. 1 Standardizing moisture targets and residue mixes not only improves energy efficiency but also creates cleaner side streams for higher-value applications (e.g., extracts and bioactives) before - or instead of - energy use.

Demand signals
Surveyed "promising biorefinery products" are led by cosmetic ingredients (24.98 %), food supplements (20.78 %), and biopharmaceuticals (16.68 %) as shown in Fig. 2.

Barriers & enablers
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Fig. 1

Logging residues (utilized vs. generated est.) – energy basis (colored)

Category	Utilized (t)	Generated (t)
Industrial (other)	~1000	~1000
Energy (other)	~1000	~1000
Industrial (other)	~1000	~1000
Energy (other)	~1000	~1000
Industrial (other)	~1000	~1000
Energy (other)	~1000	~1000

Fig. 2

Promising biorefinery products

Product Category	Percentage
Food supplements	20.78%
Bioenergy products	12.5%
Biofuel	12.5%
Betulin	12.5%
Cosmetics	24.98%

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- The Ceforestry experience demonstrates that forestry residues can be repositioned from waste to resource.
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ACKNOWLEDGEMENTS

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REFERENCES

- Ceforestry Market Research Reports (Biolat, 2024).
- Interreg Baltic Sea Region: Ceforestry project (2023–2025): <https://interreg-baltic.eu/project/ceforestry/>

Meetings with stakeholders



Webinars & Workshops

Beyond timber: market demand for forest innovations

Ilona Vanaga, JSC "Biolat"

Turning side streams into products people actually buy

- Why now: side streams → circular, high-value products (not just energy).
- Where the pull is: strongest demand in **cosmetics** and **nutraceuticals**.
- What you'll get: market signals + a practical outline

Upcoming Events

Conference presentation planned

6th World Conference on the Pharmacology of Natural Products and Traditional Medicine

#WCP2025
IUPHAR

November 26 - 28, 2025
DAKAR, SENEGAL

From Residues to Products People Actually Buy

Practical Tips for SMEs

Lessons from CEforestry distilled into actionable guidance for small and medium enterprises seeking to commercialise forest-derived ingredients and products.



Partner Early
Co-develop with a research institute and an anchor brand to secure validation, robust data and established routes to market. Joint development reduces risk and accelerates regulatory pathways.

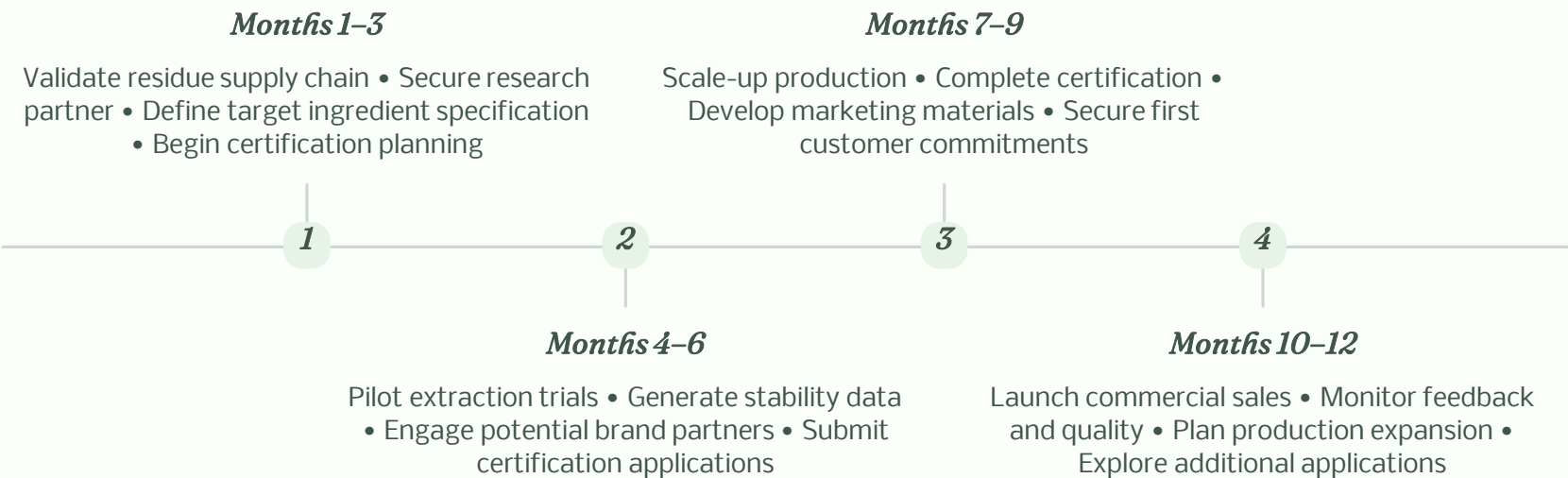
Lead with Story
Clearly explain the upcycled sidestreams narrative and back health or skin claims with solid data and relevant certificates (e.g. COSMOS/ECOCERT). Natural + circular credentials drive premium positioning.

Make It Easy
Provide ready-to-formulate ingredients with complete specifications, stability information and clear INCI/labelling fit for cosmetics and food supplements. Remove barriers for formulators.

De-Risk Technology
Invest in greener extraction methods (e.g. supercritical CO₂), improve yields systematically and track unit economics from the start. Technology choices impact both sustainability credentials and profitability.

Focus First Bets
Pick one residue → one standardised active → one target segment (cosmetics or food supplements). Combine grants (Interreg/Horizon-type) with industry co-funding to validate before scaling.

12-Month Commercialisation Outline



Critical Success Factors

- Secure raw material supply agreements early
- Budget adequately for certification (€15k - 50k)
- Build relationships before you need them
- Document everything for regulatory compliance
- Maintain financial runway for 18 - 24 months

Enabling the Transition: Policy & Investment Needs

Realising the full potential of forest biomass sidestreams requires coordinated action across policy frameworks, investment mechanisms and industry collaboration to overcome systemic barriers.

Policy Support

- Streamlined regulatory pathways for bio-based ingredients
- Harmonised certification standards across EU markets
- Public procurement preferences for circular products
- Tax incentives for biorefinery investments

Investment Mechanisms



- Blended finance models combining grants and private capital
- Risk-sharing instruments for technology scale-up
- Green bonds supporting circular infrastructure
- Regional development funds for rural bioeconomy

Industry Collaboration



- Pre-competitive R&D consortia for shared challenges
- Value-chain partnerships from forest to end-product
- Knowledge platforms connecting SMEs with research
- Demonstration projects showcasing commercial viability

Investment Priorities

Strategic investment is needed across three horizons: immediate capacity building, medium-term technology development and long-term ecosystem transformation.

€2–5M

Per Pilot Facility

Initial investment for co-located extraction and purification infrastructure

€50–150K

Per Certification

Typical costs for COSMOS, ECOCERT and food-grade certifications

18–24

Months to Market

Typical development timeline from validated process to commercial launch

Success requires patient capital that recognises the longer development timelines and certification requirements of bio-based products, whilst providing the operational runway necessary for SMEs to navigate regulatory complexity and build market presence.

Key takeaways: from sidestreams to market success



Strong Market Fundamentals

6.3% annual growth in biomass markets, with cosmetics and food supplements leading demand for forest-derived ingredients. European policy support creates favourable conditions for circular bioeconomy innovation.



Proven Product Concepts

Case studies like conifer drinks demonstrate technical and commercial feasibility. SWOT analyses highlight opportunities whilst identifying barriers that require collaborative solutions.



Ecosystem Collaboration

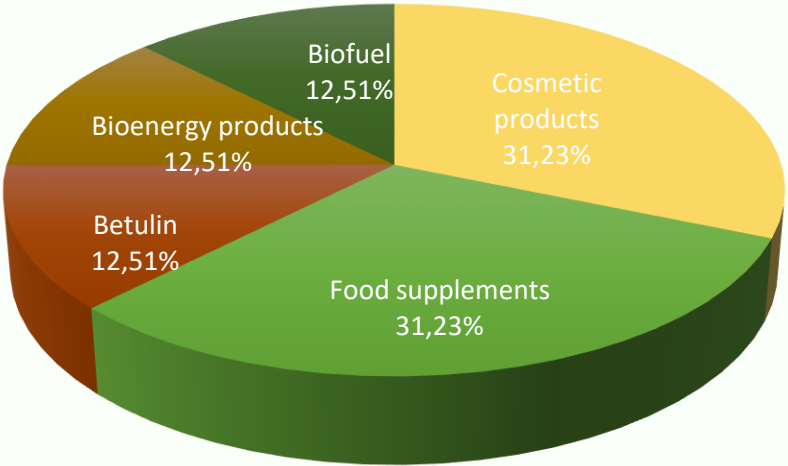
Success requires partnerships across research, industry and policy. CEforestry demonstrates the value of transnational collaboration, knowledge sharing and coordinated stakeholder engagement.



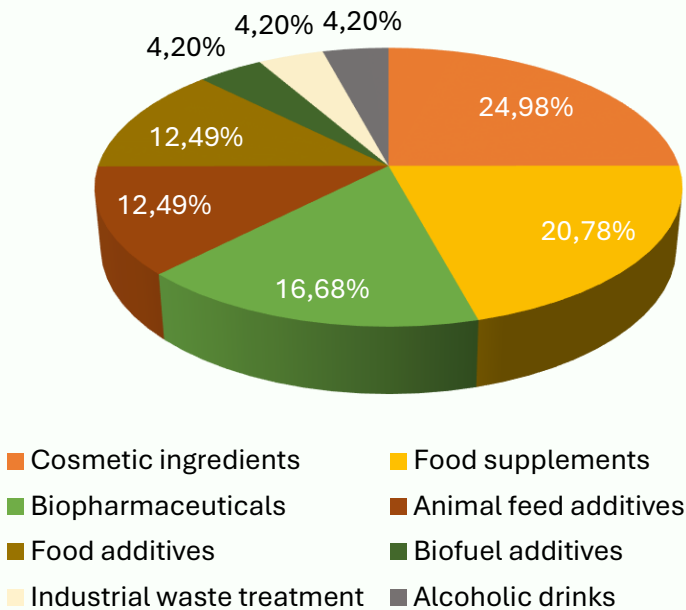
Strategic Focus Essential

SMEs should focus initial efforts: one residue, one standardised active, one target segment. Combine grants with industry co-funding. Partner early, certify properly and make formulation easy for customers.

Promising consumer products



Promising biorefinery products





After CEforestry: future directions

Building on CEforestry foundations to scale impact, develop new applications and strengthen the circular bioeconomy ecosystem across the Baltic Sea Region.

01

Leverage Market Intelligence

Use CEforestry market intelligence and case studies as a baseline for developing new residue-derived products in cosmetics, food supplements and biopharmaceuticals, ensuring product development is market-led rather than technology-push.

02

Continue Knowledge Transfer

Sustain dissemination activities through posters, webinars and SME workshops to keep repositioning forestry residues from waste to strategic resource, accelerating sector transformation and supporting policy development.



03

Address Ecosystem Gaps

Leverage survey insights showing strong perceived growth potential while addressing critical needs: more intermediate-processing companies, sustained sustainability investment and coordinated value-chain development initiatives.

Conclusions and Contact

Key Messages

Waste to Resource

CEforestry demonstrates that forestry residues can be repositioned from waste streams to valuable resources for multiple industries.

Market Intelligence

Combining green extraction technology with robust market analysis supports both nature protection and rural economic development simultaneously.

Commercial Reality

Biolat transforms side streams into products that meet real market demand in cosmetics, nutraceuticals, and pharmaceuticals with standardised, evidence-backed ingredients.

Thank You for Your Attention!

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