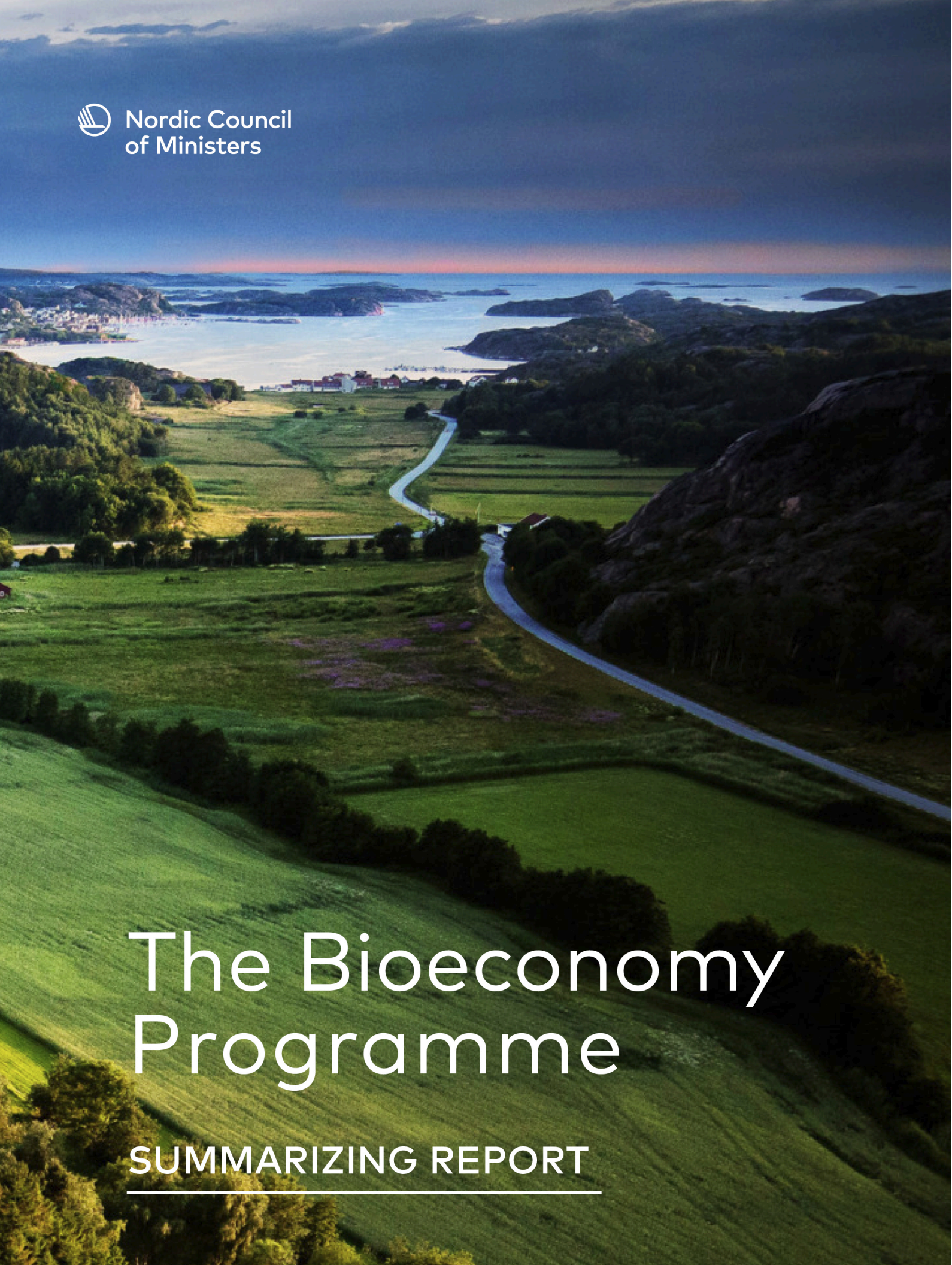

Nordic Council of Ministers

The Bioeconomy Programme

SUMMARIZING REPORT

The Bioeconomy Programme – Summarizing report

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Nordic Agri Research (NKJ) and Nordic Forest Research (SNS)

Nordic Agri Research (NKJ) and Nordic Forest Research (SNS) act as cooperation bodies for the Nordic Council of Ministers, under the Nordic Council of Ministers for Fisheries and Aquaculture, Agriculture, Food and Forestry (MR-FJLS).

NKJ promotes and supports research, innovation and policy development in the agricultural and food sectors as well as reindeer husbandry in the Nordic countries (hereinafter referred to as the NKJ sectors), as part of the Nordic bioeconomy. NKJ supports joint research efforts for sustainable and resilient agriculture, food and reindeer husbandry, increases the knowledge base for research policy and strengthens the Nordic region's position within its area of responsibility in the European research arena.

SNS's mission is to promote, coordinate and strengthen joint Nordic research efforts in forestry, to increase synergies at the Nordic level and to link research to policy by providing well-founded, evidence-based and policy-relevant information to the Nordic Council of Ministers and other decision-makers.

SNS
Nordic Forest Research

Nordic Agri NKJ Research

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Preface

To the Nordic Council of Ministers, MR-FJLS (Council of Ministers for Fisheries, Aquaculture, Agriculture, Food and Forestry)

The Bioeconomy Programme – "Bioeconomy as a driver for economic growth and green transition in rural areas in the Nordic Region" was launched during a workshop in Copenhagen in March 2020. The initiative was one of the vision projects that the Nordic prime ministers decided on as the future direction for the work of the Nordic Council of Ministers.

The programme was outlined in more detail by a working group with a secretariat at the SNS/NKJ (Nordic Forest Research/ Joint Committee for Nordic Agricultural and Food Research) Secretariat and resulted in a program outline in the autumn of 2020. MR-SAM (Council of Ministers for Nordic Co-operation) allocated DKK 12 million, or around EUR 1.6-1.7 million, to the project that was added to EK-FJLS (Executive – Committee of Senior Officials for Fisheries, Aquaculture, Agriculture, Food and Forestry).

EK-FJLS (Executive) appointed a steering group with representatives from multiple policy areas. Due to the Secretariat to the Council of Ministers being unable to enter contracts in 2021, the Bioeconomy Programme ran from 2022 to 2025.

The Nordic bioeconomy includes agriculture, forestry, fisheries and aquaculture, sectors that are variably prominent in the Nordic countries. Together, a rough estimate of the annual turnover in these sectors is around or slightly over EUR 200 billion, or about 8-12% of the total Nordic economy.

It appears from the chapters in this report that the programme has explored opportunities for increased economic value creation linked to the sale of both products and services from actors in the bioeconomy.

The Bioeconomy Programme Steering Group has commissioned several assignments from various consulting firms, and the reports in these areas contain policy briefs written by the authors of the reports.

The steering group has chosen to produce its own summary report. In this report, we have limited ourselves to the recommendations that we believe are relevant for discussions and further follow-up between the Nordic ministers in MR-FJLS.

The reports and policy briefs were summarized with the assistance of the AI-based tool ChatGPT. The generated summaries were subsequently reviewed, edited, and validated by the authors, who take full responsibility for the final content. For more detailed insights, the reader is recommended to read the original publications.

There are no dissenting opinions in this report.

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Abstract

The Bioeconomy Programme *Bioeconomy as a driver for economic growth and green transition in rural areas in the Nordic Region* was initiated within the framework of the Nordic Council of Ministers with the aim of strengthening the sustainable use of bioresources, enhancing economic growth and social sustainability in rural areas, and increasing the competitiveness of Nordic and Baltic bioeconomy sectors.

The programme has explored opportunities for increased value creation through both products and services across agriculture, forestry, fisheries, and aquaculture, with a particular focus on rural development and inclusive growth. A series of analytical assignments and policy briefs have been commissioned from external experts and consulting firms, addressing key challenges and opportunities within the Nordic and Baltic bioeconomy.

This summary report synthesises the main findings from these assignments and presents a selected set of recommendations considered most relevant for further discussion and follow-up among the Nordic ministers responsible for fisheries, aquaculture, agriculture, food, and forestry. The recommendations focus on the need to develop profitable value chains to scale up production, as well as to facilitate knowledge sharing and the dissemination of best practices across the Nordic-Baltic region.

The report reflects a shared position of the steering group and aims to support continued policy development towards a green, competitive, and socially sustainable Nordic and Baltic bioeconomy.

Project description

The acceleration of the green transition required to address the challenges of climate change, biodiversity loss, and unsustainable food systems depends on the development of the bioeconomy. The Nordic and Baltic countries have long-standing experience in utilising biomass resources in ways that contribute to economic growth.

The bioeconomy plays a crucial role in both rural and national economic development. Research and technological innovation in the circular bioeconomy are strong across the Nordic countries, and the Baltic Sea region has a long history of trade and economic exchange. Furthermore, the Nordic and Baltic countries share a well-established tradition of collaboration within the framework of the Nordic Council of Ministers.

To harness the full potential of the bioeconomy in rural regions across the Nordic and Baltic countries, challenges related to service provision, infrastructure, education, labour markets, demographic change, and economic opportunities must be addressed. The development of the bioeconomy in these rural areas should promote economic growth, support the transition to green production industries, and contribute to sustainable rural development.

The overarching vision of the programme has therefore been to strengthen long-term economic growth, generate social benefits, and accelerate the green transition in rural areas of the Nordic and Baltic countries, with the bioeconomy serving as the driving force. The Bioeconomy Programme has been implemented within the framework of the Nordic Council of Ministers' strategic priorities to achieve a green, competitive, and socially sustainable Nordic Region. It has aimed to contribute to the Council's vision of making the Nordic Region the most sustainable and integrated region in the world by 2030.

The main objectives have been to:

- Strengthen sustainable use of available bioresources in Nordic/Baltic rural areas
- Increase economic growth and social sustainability in rural areas in the Nordic and Baltic
- Enhance the competitiveness of Nordic and Baltic industries in rural bioeconomy sectors

Programme structure

The Bioeconomy Program was structured through three work packages (WPs): WP 1) Products and Services, WP 2) Infrastructure, and WP 3) Competences.

WP 1: Products and services

WP 1 focused on strengthening products and services based on bioresources, with the objective of creating sustainable economic opportunities and value chains in rural areas. The work package is divided into several thematic sub-areas, addressing issues related to proteins, bioenergy, fertilizers, tourism, and health.

WP2: Infrastructure

WP 2 addressed institutional, organizational, and infrastructural conditions necessary for a sustainable and circular bioeconomy. The work package has targeted issues relating to the market and organizational structures as well as the digitalization of the bioeconomy.

WP3: Competences

WP3 aimed to address skills supply challenges in the bioeconomy sectors. The work package focused on capacity building, job matching, and skills development across the bioeconomy to reduce mismatches and attract young people and women to careers in the rural bioeconomy.

Administration

The SNS/NKJ secretariat has run the central administration for the program, including support and organization of meetings with steering and reference group, financial administration and payments, follow-up on different WPs and support to the different projects with administrative duties, contact with stakeholders, and communication.

Chapter 1: Proteins

The chapter addresses the Bioeconomy Programme's work on green proteins. The substitution of soy protein is a political priority and has the potential to create a growing source of income for Nordic farmers. The work consists of a policy brief, *Supporting the development of green proteins in the Nordic-Baltic region*, and a report, *Consumer behaviour towards plant-based proteins in the Nordic-Baltic region.* Both publications have been shared with relevant actors in the Nordic countries for consultation and modified based on the responses.

1.1 Supporting the development of green proteins in the Nordic-Baltic region

The policy brief addresses the challenges facing the development of green proteins in the Nordic-Baltic region. The brief is based on a systematic mapping of industrial green protein initiatives, interviews with industry experts, and a multi-stakeholder workshop.

The current food system is identified as a major contributor to global greenhouse gas emissions and hence global warming, with meat production being significantly more emission-intensive than plant-based proteins. Moreover, agricultural production faces increasing vulnerability due to extreme weather events, highlighting the need for resilient food systems. The Nordic-Baltic region's dependence on imported proteins and exposure to geopolitical instability creates supply-chain risks, which increases the need for regional production of proteins for food and feed.

In this context, green proteins emerge as a potential solution for strengthening resilience, lowering greenhouse gas emissions, and supporting regional food security. The green protein market in the Nordic region has been growing rapidly in recent years. Similarly, a positive trend is observed in the Baltic region. However, several significant barriers must be overcome to enable large-scale supply and consumption. Green proteins are costly to produce due to high capital expenditure and development costs. Other challenges relate to low sales volumes, competition with subsidized meat industries, and a lack of economies of scale. Moreover, the regulatory frameworks, including the EU Novel Foods regulation, are considered complex and misaligned with the needs of the green protein sector. Overall, farmers and producers face uncertainty in shifting to green protein crops due to financial risks and the need for new knowledge.

1.2 Consumer behaviour towards plant-based proteins in the Nordic-Baltic region

The aim of the report was to explore consumer behaviour and attitudes towards both traditional and new plant-based proteins within the Nordic and Baltic countries. The findings are based on a systematic literature review of academic and grey literature from Nordic and Baltic countries, complemented by expert interviews with consumer behaviour researchers.

The report finds that awareness of climate impact, perceived health benefits, and taste preferences are significant variables influencing substitution of meat with plant-based alternatives. Some consumers recognise the climate impact of meat consumption, while others doubt them. Plant-based products are often perceived as artificial or less natural than meat. Consumers' attitudes do not necessarily translate into purchasing behaviour, as cultural norms, habits and aversion to new foods limit the shift toward plant-based diets. Social factors, such as influence from vegan or vegetarian friends, can facilitate adoption, as can visibility and availability of plant-based products. Hybrid products—combining meat and plant proteins—are perceived positively for maintaining taste while reducing environmental impact. Policymakers therefore require a deeper understanding of consumer perceptions and barriers to design measures that effectively influence behavioural change.

1.3 Recommendations

The policy brief and the report both presents a variety of policy recommendations aimed at strengthening the green protein industry. These recommendations range from establishing a Nordic-Baltic Plant Protein Partnership to communication campaigns and the alignment of a Nordic-Baltic regulatory vision.

Based on the insights from the reports, the steering group will highlight two key recommendations to the Nordic Council of Ministers.

- There is a growing demand for green proteins. Scaling up the production and consumption of crop-based proteins can contribute to economic growth, strengthen regional food security, and support climate change mitigation.
- To scale up the production, there is a necessity to develop profitable value chains for green proteins. Farmers' production of high-protein crops could be encouraged through mandates requiring the cultivation of green proteins on a certain percentage of arable land. For example, grass could be cultivated over water reservoirs.

Chapter 2: Fertilizers (plant nutrition)

Geopolitical factors and the need for urgent climate change mitigation motivated an exploration of the supply of fertilizers in the Nordic-Baltic region. The chapter summarizes the policy brief *Addressing shortages in the supply of plant nutrition in the Nordic and Baltic countries*.

2.1 Addressing shortages in the supply of plant nutrition in the Nordic and Baltic countries

The policy brief examines the vulnerabilities in the Nordic and Baltic countries' supply of plant nutrition, particularly mineral fertilizers. The study combines a regional mapping of ongoing initiatives that aim to secure the supply of plant nutrition within the Nordic and Baltic countries with an expert workshop.

The policy brief concludes that the Nordic-Baltic region is strongly dependent on imports of mineral fertilizers such as nitrogen, phosphorus, and potassium, as well as raw materials required for fertilizer production. Recent geopolitical events, including Russia's aggression of war against Ukraine, have disrupted global markets, leading to sanctions, production constraints, and higher natural gas prices – directly affecting ammonia and nitrogen fertilizer production. These developments demonstrate the need to reduce dependency on imports from potentially hostile or unstable sources. The report emphasises that without domestic capacity, preparedness remains fragile.

The mapping identifies several promising initiatives aimed at producing nitrogen, phosphorus, or potassium fertilizers domestically or through circular resource streams. Most of the significant initiatives are located in Sweden, with limited activity observed in the Baltic countries. These initiatives range from green ammonia production to phosphorus recovery from waste streams, and technologies linked to Power-to-X systems. However, the report also finds that many initiatives face long development timelines, high capital expenditure, and technological uncertainties, highlighting the need for coordinated policy support.

In addition to geopolitical risks, several challenges were identified with ongoing initiatives. There is uncertainty about whether consumers are willing to pay higher prices for fossil-free, low-carbon food products. Access to sufficient green electricity is critical for fossil-free fertilizer production, but demand is rising across multiple industries. Although many initiatives are located in areas with relatively good access to renewable energy, grid capacity constraints and higher electricity prices may become challenges. And permitting procedures are time-consuming and not well adapted to innovative technologies, creating uncertainty about production timelines. Current legislation, with its linear approach to nutrients and lack of clear quality standards, hampers circular solutions and slows down new initiatives, highlighting the need for regulatory reform.

The findings suggest that long-term and predictable policy frameworks are essential for investment certainty. Stronger collaboration across stakeholders is needed to accelerate development, share knowledge, and build regional preparedness. The study concludes that the region must refine its understanding of self-sufficiency, strengthen stakeholder networks, and further develop policy analyses to support implementation.

2.2 Recommendations

The Policy brief presents various policy recommendations to address challenges and support full-scale production of fossil-free fertilizers. Drawing on the findings of the brief, the steering group will highlight priority recommendations for consideration by the Nordic Council of Ministers:

- Consumer demand for fossil-free fertilizers is identified as a critical factor for scaling up production, and potential measures to stimulate such demand should be further explored.
- In addition, the feasibility and level of interest in establishing a Nordic–Baltic network or platform to connect stakeholders and facilitate knowledge sharing across the value chain could be assessed.

Chapter 3: Bioenergy

Bioenergy from wood, peat and other biological materials is the oldest form of energy. It complements fossil fuels, electricity, wind, and solar power by increasing system flexibility and easing pressure during peak demand or low water/wind conditions. Local bioenergy and biogas production reduce dependence on imported fossil fuels and strengthen energy security, but further investment depends on profitability and local value creation.

This chapter reproduces the content of three Nordic reports: The scoping papers *Knowledge transfer in the Nordic-Baltic Region for increased uptake of sustainable energy* and *Seminars for knowledge transfer on bioenergy in the Nordic-Baltic bioeconomy* and the report *Integrated Local Solutions for Bioenergy*.

3.1 Bioenergy – knowledge transfer in the Nordic-Baltic Region for increased uptake of sustainable energy

Bioenergy can play a vital role for the reduction of CO_2 emissions in the Nordic-Baltic countries. The scoping paper identifies bioenergy innovations of interest for further knowledge transfer efforts within the Nordic-Baltic region and proposes potential knowledge-sharing activities.

The scoping-paper is based on a multi-method approach combining desktop research, document analysis, expert interviews, and previous Nordic studies to map bioenergy innovations and ongoing initiatives. The report finds that bioenergy plays a central role in reducing emissions from heating, electricity generation, and

transport, but adoption varies across countries and sectors. Heating and transport are especially critical, given their high share of emissions. Sustainable Aviation Fuels (SAFs) are identified as a major opportunity for reducing emissions in aviation, while biogas, biodiesel, and biofuels serve land and maritime transport.

The study also identifies challenges such as competition for biomass resources, uncertainties linked to EU sustainability taxonomy, supply chain vulnerabilities, and differences in biomass classifications and standards. Moreover, knowledge gaps persist across the value chain. The mapping of innovations shows a diverse landscape of projects, but limited mechanisms for regional coordination. Stakeholders highlight the need for integrated local solutions, enhanced collaboration, and better structures for knowledge exchange. These insights point to the importance of a common Nordic-Baltic approach to accelerate sustainable bioenergy development.

3.2 Seminars for knowledge transfer on bioenergy in the Nordic-Baltic bioeconomy

This report follows up on the recommendations developed in the Bioenergy scoping paper summarized above, addressing the challenge of strengthening the Nordic–Baltic bioenergy landscape through structured knowledge-sharing and stakeholder cooperation. Four digital stakeholder seminars were conducted with researchers, bioenergy organisations, practitioners, and policymakers. The seminars combined structured presentations with quantitative ranking and qualitative discussions and were used to assess the proposed policy recommendations.

The most highly prioritised measure was the identification of integrated local solutions, which participants considered essential for practical knowledge transfer. It was followed by the creation of a Nordic-Baltic cooperation platform on bioenergy, although some participants questioned the need for additional knowledge-sharing networks.

The participants raised many challenges for the different stages of the bioenergy value chain and identified potential solutions. Most challenges highlighted related to biomass availability as well as the regulatory and market conditions on national levels and within the EU. Coordination and standardization were generally encouraged across all stages of the value chain to address the identified obstacles.

The report identifies three challenges highlighted in the seminars as particularly relevant for Nordic–Baltic cooperation: Decision-making regarding whether to import or locally source biomass; increasing competition for biomass; and the lack of coherent classification systems.

3.3 Integrated local solutions for bioenergy

The objective of the report was to collect best-cases of integrated local bioenergy solutions across the Nordic-Baltic region.

The report draws on a collection of six case studies; LinkoGas (Denmark) Biogas Gotland (Sweden), Bakkafrost's FÖRKA (Faroe Islands) Horsens Bioenergi (Denmark) Greve Biogass(Norway) and Fredericia Spildevand Energi AS (Denmark). Sources include earlier Analys Mason reports for SNS/NKJ, Nordic Energy Research material, expert consultations, team networks, and desk research. The final report synthesises the insights from these cases and organises them into common themes intended to support knowledge transfer and policymaking.

Across the collected cases, the report finds that integrated local bioenergy systems rely on predictable feedstock streams, close cooperation between farmers and industry, and diversification of outputs such as biogas, biofertilisers, and captured CO_2. Projects often face permitting challenges, community resistance, logistics costs, and financing barriers. Successful cases demonstrate strong municipal involvement, long-term contracts, anchoring in cooperative structures, and early stakeholder engagement. Diversified revenue streams make plants more resilient to market fluctuations.

3.4 Recommendations

Guided by the insights from the presented reports, the steering group has identified a few key recommendations for the Nordic Council of Ministers.

- To support the development and implementation of relevant technological innovations in the bioenergy sector, enhanced knowledge and technology transfer across the Nordic countries is recommended. Through joint projects and networks, stronger collaboration between Nordic researchers, policymakers, and industry actors can be achieved.
- Successful case studies of integrated local bioenergy solutions could be identified and compiled to facilitate knowledge sharing amongst relevant stakeholders such as municipalities, farmers, utilities and industry, leveraging local conditions and biomass sources.
- The interest in and need for a Nordic-Baltic bioenergy platform, as well as hackathons or workshops to foster regional collaboration, could be explored. Any such initiative should be preceded by a mapping of existing bioenergy networks and initiatives in the Nordic-Baltic region to avoid duplication and instead build synergies.

Chapter 4. Marine and river fishing tourism

Recreational fishing in the Nordic countries carries cultural, social and economic value. The chapter summarizes the Bioeconomy programme's report *Marine and River Fishing Tourism in the Nordic Region.*

4.1 Marine and river fishing tourism in the Nordic region

The report addresses the economic, cultural, and sustainability dimensions of marine and river fishing tourism in the Nordic region, focusing on Iceland, Norway, Sweden, and Finland. The study is based on existing research, official statistics, and newly collected data from national authorities, research institutions, organisations and enterprises. In addition, case studies were carried out to highlight regional particularities from Súðavík in Iceland, Lofoten in Norway, Mörrum in Sweden, and Lapland in Finland.

The findings demonstrate that recreational fishing plays a substantial economic and social role across the Nordic region, contributing to employment, tourism revenues, cultural heritage, and social welfare, albeit with marked national differences. In Iceland and Sweden, fishing tourism is oriented towards high-income markets, particularly salmon angling, generating high per-fish economic returns and supporting rural communities. In Norway, marine fishing tourism has expanded rapidly alongside strong commercial fisheries, especially in Northern Norway, intensifying competition for coastal cod stocks and increasing regulatory complexity. In Finland, participation in recreational fishing is among the highest in

Europe and is characterised by broad domestic engagement and significant welfare value. However, the sector is vulnerable to ecological fluctuations and regulatory decisions, as illustrated by the salmon fishing ban on the River Teno.

Across all four countries, recreational fishing represents a significant economic resource, ranging from high-end market revenues to large-scale welfare and regional development effects. Related services such as accommodation, guiding, restaurants, and equipment supply account for a large share of value added and employment. Consumer surplus estimates indicate that the social value of recreational fishing exceeds what is captured in conventional economic statistics. Sustainability emerges as the central challenge, with pressures from aquaculture, declining fish stocks, and climate-related impacts underscoring the need for adaptive governance.

4.2 Recommendations

Based on the insights from the report, the steering group proposes:

- Consider the establishment of a working group with representatives from the Nordic countries to promote marine and river fishing tourism in the Nordic region and facilitate the transfer of successful practices.
- The steering group further proposes that collaboration on marine and river fishing tourism could be explored with the Nordic tourism working group under EK-Vekst, since the industry is highly dependent on the wider tourism industry.

Chapter 5: Health

Many people experience positive health effects from physical activity, contact with animals, and spending time in nature. In the Nordic countries, there are several initiatives based on these elements. The chapter summarizes the content of the Nordic report *Nature-Based Health Interventions (NBHI) in the Nordic–Baltic Region,* examining the status and conditions for nature-based health interventions.

5.1 Nature-Based Health Interventions (NBHI) in the Nordic–Baltic region

This report maps nature-based health interventions (NBHIs) status in the Nordic-Baltic region as well as identifies challenges and provides policy recommendations. The report is based on a desktop search for the mapping of nature-based health interventions in combination with interviews with experts and practitioners. In addition, a practitioner-oriented booklet has been developed.

Nature-based health interventions are activities aimed at supporting individual's health and well-being through exposure to and contact with nature, for example on small scale farms and horticultural production sites. The report indicates that NBHIs have the potential to supplement public health and social care systems in rural areas, contribute to community-building and be an additional source of income on farms. NBHIs can complement conventional health services by addressing mental health issues, stress, chronic diseases, and social isolation through structured activities involving nature, animals, or outdoor environments.

Despite growing interest, NBHIs remain insufficiently supported by institutions. Their development is uneven: Countries like Norway, Sweden, and Finland have established networks (Inn på Tunet, Grön Arena, Green Care Finland), while Baltic countries show fragmented or small-scale initiatives. Across the region, practitioners struggle with financial predictability, lack of long-term contracts, scepticism from healthcare providers, and inconsistent legislative frameworks. Public awareness remains limited, and medical communities often lack knowledge about NBHIs' benefits.

Interviewees emphasised pressing needs for stronger national strategies, harmonised definitions and regulations, improved knowledge of NBHI effectiveness, and sustained communication efforts. The report concludes that NBHIs possess both economic and public health potential but require structural reforms to realise this potential.

5.2 Recommendations

To support the development of nature-based health interventions and fully realize their potential, the report summarizes three recommendations. These include the development of evidence-based studies, the promotion of national strategies, and the communication and promotion of the benefits of NBHI's.

Out of these, the steering group recommends that the Nordic council of ministers focuses on the following:

- The development of evidence-based studies is essential for both health authorities and practitioners to increase public awareness of nature-based health interventions and their benefits, including their economic potential, and their capacity to complement other health treatments and educational programs.
- Activities could include the establishment of a Nordic–Baltic NBHI task force to coordinate a regional research project, as well as funding evidence-based studies on the economic potential of NBHIs for public institutions and rural areas, and studies identifying public service sectors where the inclusion of NBHIs could help alleviate overload.
- Communication and promotion of NBHI benefits, combined with evidence-based research, could support wider adoption by raising awareness and disseminating findings on their economic and societal value to relevant institutions.

Chapter 6: The Nordic Testbed Network

The advancement of the Nordic-Baltic bioeconomy is dependent on digital and innovative development. Access to cutting-edge testbeds plays a central role in developing new digital knowledge and technologies. To support this transformation, the Nordic Testbed Network was established. This chapter summarizes the report *Results, benefits, and added value of Nordic-Baltic collaboration supporting digital advancements in the bioeconomy sectors.*

6.1 The results, benefits and added value from the Nordic-Baltic – collaboration to support digital advancements in the bioeconomy sectors

Addressing climate and biodiversity challenges in the Nordic-Baltic region requires transforming food and energy production systems. Realising this transformation depends not only on environmental ambition but also on the availability of robust digital infrastructure and the competencies needed to use it effectively.

Testbeds are environments – physical or virtual – developed to enable the testing of new products and solutions by enterprises, researchers and organizations. The Nordic Testbed Network was established to connect actors and facilities within the region who contribute to the digital and innovative transformation of the bioeconomy. By connecting the various facilities that exist across the region, the Nordic Testbed Network ensures that knowledge and practical solutions can circulate more widely.

The report highlights key benefits and results valued by networks members. Meeting experts and other members provided insights into the latest developments, and the network served as a platform where members could share their own results and learn across different sectors. While developments have had different levels of progress, the sectors within the bioeconomy use the same technologies and digital tools. By enabling connections with like-minded people who share challenges and ambitions, the network worked as a platform from which concrete collaboration could develop.

The report identifies several lessons learned. Testbeds rely on knowledge sharing among individuals, but limited resources and time constraints for travel are perceived as significant challenges. Securing long-term funding is described as an ongoing difficulty. Active coordination of the network is seen as essential for it to remain relevant.

Future plans and priorities focus on activities based on member needs, combining updates, funding information, and knowledge exchange. The network aims to balance different types of activities and provide both larger events and shorter updates connected to societal and political changes. The report also highlights support to projects in their initial stage as a key priority. Increased knowledge sharing on funding opportunities, insight into members' ongoing and planned projects, and strengthened matchmaking are seen as mechanisms for accelerating collaboration and transforming early ideas into concrete projects.

6.2 Members of the Nordic Testbed Network

Testbed	Sector	Country
Gigacow	Agriculture/Food	Sweden
Alovivum	Agriculture/Food	Sweden
AU Center for Smart Farming	Agriculture/Food	Denmark
Testbed for Digitalised Agriculture	Agriculture/Food	Sweden
OuluZone+	Forestry	Finland
Västervik Drone Science Park (VDSP)	Forestry	Sweden
Mistra Digital Forest	Forestry	Sweden

FITPIG	Agriculture/Food	Sweden
Center for Precision Agriculture	Agriculture/Food	Norway
Troëdsson Forestry Teleoperation Lab	Forestry	Sweden
Latvian Institute of Aquatic Ecology	Aquaculture	Latvia
SITES	Forestry	Sweden
TETRAS	Aquaculture	Lithuania
AgroTech	Agriculture/Food	Denmark
DigiFoods	Agriculture/Food	Norway
Latvian i-Garden	Agriculture/Food	Latvia
SINTEF ACE	Aquaculture	Norway
DIGIRAS	Aquaculture	Norway
Intelligent Organic Farming Testbed	Agriculture/Food	Latvia
Smart Bioeconomy Testbed (Tarvaala Smart Farm + AB SmartDIH)	Agriculture/Food	Finland
AORO: Arctic Off-Road Robotics Lab	Forestry	Sweden
UCPH/PLEN living labs	Agriculture/Food	Denmark
Hushållningssällskapet Skåne	Agriculture/Food	Sweden
TSAgro	Agriculture/Food	Denmark

6.3 Recommendations

To maximize the benefits for its members, the Nordic Testbed Network plans to continue organising activities based on members' requests, while combining updates, information on funding opportunities, and knowledge exchange. In addition, several members highlight the network's role in enabling collaboration and see potential for supporting joint funding applications. Responding to this, greater sharing of information about funding opportunities, as well as insight into members' ongoing or planned projects, will be important.

To the Nordic Council of Ministers:

- Efforts to secure continued backing and stable support structures for the Nordic Testbed Network could help safeguard its ongoing development and relevance for members.

Chapter 7: Young entrepreneurship

The Nordic countries face challenges in recruiting young people to agriculture. Farm work is time-consuming, often isolating, and the sector struggles to compete in terms of income levels. In response, several Nordic initiatives aim to make farm succession and food production more attractive to young people.

The chapter presents the Bioeconomy Programme's work on young entrepreneurship. The chapter reproduces the content of the Nordic policy brief *Farm Diversification Among Young Entrepreneurs* and the *Inspiring rural entrepreneurs – Five Nordic role models.*

7.1 Farm Diversification Among Young Entrepreneurs

The Nordic-Baltic region is facing challenges with rural depopulation. To attract young people to rural areas, entrepreneurial opportunities in the rural sectors could be strengthened. In this context, the diversification on farms represents opportunities in combining enterprises on farm level. The policy brief presents initiatives and challenges related to young rural entrepreneurs in the Nordic and Baltic region. It is based on a systematic mapping of literature, a complementary snowball search strategy, and a stakeholder workshop.

The policy brief addresses demographic and structural challenges facing rural areas in the Nordic and Baltic region. There are fewer and larger farms, and the generational renewal is lacking. The report highlights that rural quality of life is

increasingly strained by unmet social needs and economic opportunities. In the Nordic region, youth are for example disfavoured of the housing market, and the fewer career opportunities for educated youth in the rural areas is another challenge. As younger people leave, rural communities lose key drivers of innovation and economic growth.

Against this backdrop, farm diversification emerges as a strategic tool to create new income streams, attract young people to rural life, and stimulate local development. The identified benefits include the possibility to diversify sources of income and the use of all available farm resources which contributes to resilience. The report also highlights employment generation as a positive secondary effect. Examples of diversified farm activities include farm tourism, wool and wood products, local food initiatives, renewable energy, forest management and nature-based health interventions.

Despite the potential benefits, young entrepreneurs face several obstacles related to competence, identity, financial risk, and regulatory complexity. Diversification inherently requires the acquisition of new skills, including competencies in areas such as marketing and market orientation. Limited access to financial capital might be discouraging. Diversification further entails increased regulatory complexity and navigating these complexities can be particularly challenging for young entrepreneurs. Ongoing efforts by EU, national, and local actors provide some support, but gaps remain in accessible funding, knowledge-sharing structures, and coordinated policy frameworks.

7.2 Inspiring Rural Entrepreneurs

Building on the insights from above mentioned policy brief, the report *Inspiring rural entrepreneurs – Five Nordic role models* aims to highlight how young rural entrepreneurs can contribute to revitalising Nordic rural areas under conditions of structural change and difficulties in attracting young people to agricultural and land-based careers. By showcasing five young entrepreneurs from across the Nordic region, the report seeks to provide inspiration for viable business models and encourage greater Nordic knowledge sharing on rural entrepreneurship.

The report is based on qualitative interviews with five rural entrepreneurs from Sweden, Finland, Norway, Denmark and Iceland, and is informed by earlier Nordic policy work, particularly Nordic Agri Research's *Policy brief on farm diversification* (2025) and Nordregio's *Growing Food(ies): Empowering youth in the Nordic food systems* (2025).

Across the five case studies, the report identifies recurring patterns among the featured entrepreneurs, including a strong connection to place and family traditions alongside a willingness to explore new ideas and business models. Several role

models combine primary production with activities such as food processing, direct sales, or services, illustrating different ways of creating added value and broadening income streams. The cases also point to the importance of a viable core business and strong attention to day-to-day operations as a foundation for additional activities. Many entrepreneurs emphasise their relationship with the surrounding community, describing farms as social spaces and using social media and customer interactions to increase visibility and interest in local food and rural businesses.

7.3 Recommendations

To support farm diversification among young farmers in the Nordic and Baltic region, the report *Farm Diversification Among Young Entrepreneurs* proposes a set of targeted policy recommendations. These recommendations aim to expand funding mechanisms, raise awareness of bioeconomy opportunities, facilitate knowledge sharing, and explore ways to reduce the regulatory burden on diversified farm businesses. Among these, the steering group highlights three key priorities:

- Through best-practice examples, awareness of the potential of farm transition can be increased, helping to make rural entrepreneurship more attractive. Showcasing different pathways can enable young entrepreneurs to find inspiration and role models among peers engaged in diversified farming.
- Facilitate knowledge sharing and help build a stronger group identity by, for example, supporting youth clusters and coordinating cross-regional events that particularly target young farmers and rural entrepreneurs. Platforms where young entrepreneurs can meet, exchange experiences, and access peer support can contribute to problem-solving and to strengthening a shared sense of identity.
- For rural areas to remain attractive for youth, there is a need for local community services such as education, health, housing, and cultural activities. Strengthening these areas requires greater political attention.

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