

Nordic Co-operation Programme on Energy Policy 2022–24



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Foreword

The recent Intergovernmental Panel on Climate Change (IPCC) report provides food for thought but little in the way of surprises. Unless we introduce wide-ranging measures, we will no longer be able to halt global warming.

Global climate change makes it important to develop and produce technology and solutions that can be used extensively, including in other parts of the world, and that reduce the climate footprint of our products. There is a need and great demand for effective and cost-efficient solutions in all sectors. It is also an area in which the Nordic countries have much to offer with our competences in fields such as the bioeconomy and efficient-energy consumption. The integration of different energy systems is another one of our strengths, including the much talked about use of nitrogen, for example.

The Nordic countries have a vision of the Nordic Region as the most sustainable and integrated region in the world by 2030. Together, we will promote the transition to a green economy, climate neutrality, a sustainable circular economy and the bioeconomy. The Nordic Council of Ministers' new co-operation programme in the field of energy defines the initiatives that we will implement in the period 2022–2024 to achieve these goals. The green transition in the energy sector is at the centre of it all, and the Nordic countries' joint electricity market, renewable energy, energy efficiency and research are still key elements in the work. The green transition of the transport sector is also part of an intersectoral project.

It is essential to work together on EU and EEA issues. The EU Green Deal and Fit for 55 legislation combine to constitute a holistic approach that will affect the whole of society, and this is also reflected in Nordic co-operation. The more ambitious targets for emission reductions and the goal of climate neutrality require action and extensive investments in CO₂-saving solutions and techniques.

Climate neutrality is a challenging goal, but the Nordic countries can learn a lot from each other, and the Council of Ministers and its groups are a good channel for exchanging best practices in the energy sector. Together we are stronger – including in this area.

Without forgetting the importance of new research and development, it is worth bearing in mind that many of the existing techniques already help the world achieve climate neutrality. We must also take advantage of these techniques. An energy policy that focuses on climate neutrality at both national and Nordic levels ought to be predictable and consistent in the long term. Therefore, it is vital that all of the solutions we choose must stem from evidence-based knowledge and be cost-effective.



**Mika Lintilä, Minister of
Economic Affairs, Finnish
Presidency 2021.**

Mika Lintilä

Minister of Economic Affairs, The Finnish Presidency 2021



Introduction

Nordic co-operation on energy policy

The Nordic Region has a vision of being the most sustainable and integrated region in the world by 2030. All of the work done by the Nordic Council of Ministers serves this purpose, and it is also the overall vision for co-operation on energy. A green transition of the Nordic societies will not be possible without a substantial green energy transition.

As the Nordic energy systems are closely linked, working together on joint initiatives will lead to a green transition that is more cost-effective and socially sustainable than if the countries were each to achieve the goals individually. The three strategic priorities and 12 objectives laid out in Our Vision 2030 set the frameworks for energy co-operation in the years to come, and all of the energy sector's activities seek to implement the action plan for 2021–24 and realise the vision.

For co-operation on energy, the strategic priorities translate into one overall goal:

To develop Nordic energy systems through strong, trust-based, adaptable collaboration in order to secure the world's most integrated and intelligent low-emission green economy, characterised by high competitiveness and security of supply.

It is important for the Nordic Region to continue the co-operation on energy, which has been so successful because the electricity market is so closely integrated at the regional level. Doing so means that energy policy initiatives in one country also have an impact on the others. The Nordic countries also have a joint EU/EEA energy agenda, which is constantly changing and is important for the green transition. The Nordic Region can play a proactive role in implementing the European Green Deal in the energy sector.

Whenever relevant, energy co-operation also contributes to the implementation of the Nordic Council of Ministers' three horizontal

strategies on sustainable development, children and young people and gender equality.

Nordic Energy Research (NEF) assists the Nordic Committee of Senior Officials for Energy Policies and its working groups. NEF's job is to provide politically relevant specialist knowledge for use in political decision-making processes.

The programme was adopted by the Nordic Council of Ministers for Sustainable Growth /Energy on 1 October 2021 and covers the period 2022–24.

THE 12 OBJECTIVES IN OUR VISION 2030

A GREEN NORDIC REGION. *Together, we will promote a green transition of our societies and work towards carbon neutrality and a sustainable circular and bio-based economy.*

In 2021-24, the Nordic Council of Ministers will:

1. strengthen research and development and the promotion of solutions that support carbon neutrality and climate adaptation, including in relation to transport, construction, food, and energy;
2. contribute to the safeguarding of biodiversity and the sustainable use of the Nordic region's nature and seas;
3. promote a circular and bio-based economy, sustainable and competitive production, sustainable food systems-, and resource-efficient and non-toxic cycles in the Nordic region;
4. make it much easier and more attractive for Nordic consumers to prioritise healthy and environmentally and climate-friendly choices, with joint efforts relating to sustainable consumption;
5. contribute to the positive development of international co-operation on the environment and climate, such as by promoting Nordic green solutions in the rest of the world.

A COMPETITIVE NORDIC REGION. *Together, we will promote green growth in the Nordic region based on knowledge, innovation, mobility, and digital integration.*

In 2021-24, the Nordic Council of Ministers will:

6. support knowledge and innovation and make it easier for companies throughout the Nordic region to take full advantage of the development opportunities created by the green, technological, and digital transformation, and the growing bioeconomy;
7. develop skills and well-functioning labour markets that match the requirements of the green transition and digital developments, and that support freedom of movement in the Nordic region;
8. leverage digitalisation and education to bind the Nordic countries even closer together.

A SOCIALLY SUSTAINABLE NORDIC REGION. *Together, we will promote an inclusive, equal, and interconnected region with shared values and strengthened cultural exchanges and welfare.*

In 2021-24, the Nordic Council of Ministers will:

9. contribute to good, equal, and secure health and welfare for all;
10. work to involve everyone living in the Nordic region in the green transition and digital developments, utilise the potential of this transition, and counteract the widening of gaps in society as a result of this transition;
11. give Nordic civil society, and especially children and young people, a louder voice and greater participation in Nordic co-operation, as well as increase their knowledge of the languages and cultures of neighbouring countries;
12. maintain trust and cohesion in the Nordic region, its shared values, and the Nordic community with an emphasis on culture, democracy, equality, inclusion, non-discrimination, and freedom of expression.

Our vision 2030

A **competitive** Nordic region

Together, we will promote green growth in the Nordic region based on knowledge, innovation, mobility and digital integration.

A **green** Nordic region

Together, we will promote a green transition of our societies and work towards carbon neutrality and a sustainable circular and bio-based economy.

**The Nordic
region will
become the most
sustainable and
integrated region
in the world**

A **socially sustainable** Nordic region

Together, we will promote an inclusive, equal and interconnected region with shared values and strengthened cultural exchange and welfare.





Strategic priorities

In line with the Nordic Vision 2030, the Prime Ministers' Declaration on Carbon Neutrality and the overall objectives of the co-operation on energy, the programme focuses on activities that support the green transition in the energy sector and the transition to an economy based on sustainable and climate-neutral energy in areas considered a priority. Nordic energy co-operation can play a crucial role in making the first phase from 2022 until 2024 a success and realising the longer-term vision towards 2030.

In 2020, the Nordic Council of Ministers for Sustainable Growth (MR-VÆKST/Energy) adopted seven focus areas as input into the action plan for Our Vision 2030:

- The green transition of the energy sector
- Closer collaboration on research to aid the green transition
- Nordic co-operation in the electricity market
- Energy efficiency, technology and behavioural change
- Working together on EU/EEA-related energy issues
- Social acceptance of new energy plants and the green transition
- The green transition of the transport sector (intersectoral project).

The seven focus areas will constitute the core of the work done by Nordic energy co-operation in the period up to the end of 2024.

The seven areas are described in the sections below. They will be adapted on an ongoing basis to address challenges that the countries and energy co-operation encounter during this period so that the maximum possible Nordic synergies are derived from the activities.

Since all of the activities in which Nordic energy co-operation is involved contribute to the green transition, most of the initiatives are described under the strategic priority Green Nordic Region. However, the initiatives are also important for the competitiveness of Nordic companies and will be implemented in a socially sustainable manner.

A GREEN NORDIC REGION

The green transition in the run-up to 2030 will require wide-ranging measures and close Nordic working relations in a range of areas within the energy sector in the period 2022–2024.

To address this situation, the Nordic Programme for Co-operation on Energy Policy 2022–24 covers a range of themes, including the ongoing work on renewable energy, working together on research and analyses, the electrification of various sectors, system integration and linking different sectors together, co-operation on offshore wind energy, closer collaboration on hydrogen strategies and carbon capture, utilisation and storage (CCUS). An efficient and well-run Nordic electricity market is a prerequisite for the long-term work of developing an environmentally friendly electricity system in the Nordic Region.



A GREEN NORDIC REGION.

Together, we will promote the green transition of our societies and strive for carbon neutrality and a sustainable, circular and bio-based economy.

The green transition of the energy sector

The transition to renewable energy is at the heart of the green transition in the Nordic Region. Nordic energy co-operation aims to reduce our use of fossil fuels and associated CO₂ emissions in all sectors. Renewable energy brings with it huge potential for new environmentally friendly production capacity in the Nordic countries. We also need to combine larger amounts of wind and solar energy with hydropower, geothermal energy and biomass to ensure that the energy system is both stable and cost-effective. The transition to a higher proportion of renewable energy presents new challenges but also new opportunities to work together to benefit from the synergy effects of a coherent energy system.

The co-operation is based on the further development of Nordic energy analyses, technological knowledge and statistics that underpin political decisions, strategic development and Nordic action plans for the green transition in the energy sector.

The mix and use of sources of energy and technology vary from country to country in the Nordic Region. Some have a great deal of hydropower, others biomass, geothermal or wind energy; some use renewable sources directly for electricity and heating, others convert it to other energy carriers/uses (e.g. biogas to biofuels or wind to hydrogen). The energy co-operation will generate synergy effects by linking different sectors together. The co-operation itself will be enhanced by being closely integrated both in the Nordic Region and, due to many similar challenges, in the EU/EEA.

Nordic electricity production is well on the way to being CO₂-free. We can reach 100% by 2030 and focus more closely on progress in sectors where decarbonisation is more challenging. To achieve this, the co-operation on energy will pay greater attention to work with transport, industry and heating, areas in which we are further from our goal.

However, as using electrification for sector coupling will be one of the most effective methods of promoting the green transition in these sectors, there will also be a need for a significant increase in the production of renewable electricity and co-operation on the transition to a smart energy system capable of providing flexibility and security of supply at acceptable prices. This work will include digitalisation and energy storage, and more widespread electrification will also improve energy efficiency. Working together to remove barriers to smart sector coupling can also help develop a smart, coherent energy system so that the Nordic Region can lead the world as the most integrated and sustainable region in the field of energy.

The cheapest and most plentiful sources of renewable energy are wind, water, solar, biomass and geothermal. The levels of electricity generated from the first three of these resources vary by the hour, day and year. They are also found in different parts of the Nordic Region, which makes co-operation between the different parts essential.

Offshore wind has the potential to make a significant increase to the production of renewable electricity and green energy. For the Nordic countries, this provides a unique opportunity, as both the North Sea and the Baltic Sea are home to areas particularly favourable for offshore wind expansion, which means they can play key roles in the whole of Europe's green transition. However, exploiting this great potential will also lead to significant cross-border challenges in relation to the environment and biodiversity, areas in which building knowledge together can help support positive solutions.

As stressed in the European Commission's Hydrogen Strategy, hydrogen has the potential to be a significant driver of the green transition. The Nordic Region is well placed to contribute. The study of Power-to-X (fuels produced with the help of electricity) and heavy road traffic, for example, revealed opportunities for the Nordic Region. In the period covered by this programme, the Nordic countries will identify potential, including synergies between Power-to-X and CCUS, and based on this, the need for joint political initiatives in this area will be assessed. The aim is to ensure that the Nordic Region maintains its leading position by working together to unlock synergies.

Nordic co-operation on carbon capture, storage and use (CCUS) will be important for the ambition of achieving carbon neutrality by 2050. In the Nordic Region and the North Sea region, it has been established that the potential exists for a full-scale CCUS chain with functioning transport routes and storage infrastructure. In addition, the fact that the Nordic countries – particularly Sweden and Finland – have a high proportion of biofuels in their total energy mix means that Bioenergy with Carbon Dioxide Capture and Storage (bio-CCS) can serve as an effective alternative to achieving negative emissions in the region. In addition, Iceland is working on the Carbfix project, which involves turning CO₂ into stone. The Baltic states can be incorporated into this work via the Baltic Carbon Forum¹ and the network group for CCUS that has been set up.

1. The Baltic Carbon Forum is an annual international conference organised by the BASREECS network. The idea is to provide official agencies, research institutions, companies and other regional stakeholders in the Baltic Sea Region with a forum to discuss the latest knowledge on CCUS. The Nordic Council of Ministers has supported the event in recent years.

The energy sector's work with this initiative supports Our Vision's strategic priorities of a green and competitive Nordic Region, in particular Objective 1.

Nordic co-operation on the electricity market

The Nordic co-operation on the electricity market is guided by the electricity market vision for 2030, which the energy ministers adopted in 2019, i.e., "ensure that by 2030, the Nordic Region has the most competitive, sustainable, integrated, innovative, and user-friendly electricity market in the world". This vision for the electricity market is part of the Nordic Council of Ministers' overall vision and will help meet overall Objective 1: "The Nordic Council of Ministers will bolster research and development and the promotion of solutions that support carbon neutrality and climate adaptation, including in relation to transport, construction, food, and energy," as well as Objective 6: "The Nordic Council of Ministers will support knowledge and innovation and make it easier for companies throughout the Nordic Region to take full advantage of the development opportunities created by the green, technological, and digital transformation and the growing bioeconomy."

Co-operation in the electricity market takes into account a whole range of factors to help make the Electricity Market Vision 2030 a reality. The four most important are: 1) facilitating increased production of renewable energy while also paving the way for greater use of climate- and environmentally friendly energy through electrification of several sectors; 2) developing technology and increasing digitalisation (smart energy systems), which are crucial to greater flexibility and the implementation of solutions in the market; and 3) expanding the supply network, at national and Nordic levels, and increasing the number of connections to other countries. An appropriately designed electricity market will be the primary tool for pursuing our goals. A well-functioning electricity market is crucial for the efficient use of resources and will help to ensure that electricity does not become any more expensive than it needs to be. In addition, we will seek to achieve a higher degree of flexibility by adapting the design of the electricity market, as greater flexibility is the key to coping with higher and unpredictable amounts of renewable energy. Close attention will be paid to consumer flexibility, which will be facilitated by electrification and digitalisation.

We will also pursue 4) new regulations at EU and national levels, which regulate the electricity market. We will try to speak with a united voice in Europe to safeguard Nordic interests and our Nordic system. It is important that the Nordic voice is heard in forums such as the European Network of Transmission System Operators for Electricity (ENTSO-E) and the European Union Agency for the Cooperation of Energy Regulators (ACER).

How the electricity market develops will depend on all of the actors entering into a dialogue and pulling together – energy producers, consumers, transmission system operators (TSOs) responsible for the high voltage network, the national regulators (NRAs) and the power exchanges. The main forum for this dialogue is the annual Nordic Electricity Market Forum, which articulated the vision for the electricity market in 2018 and drew up an action plan to achieve it, complete with detailed targets for the Electricity Market Group, NRAs and TSOs. It is important that close co-operation on the Nordic electricity market reflects the players involved, including the TSOs, NRAs² and the Regional Coordination Centre (RCC).

The Electricity Market Group provides the secretariat and coordination function for the Forum and all of its work, including by following up on the implementation of all of the activities included in the action plan.

The Nordic co-operation on the electricity market supports Our Vision's strategic priorities of a green and competitive Nordic Region, in particular Objective 1.

Energy efficiency, technology and behavioural changes

Efficient use of energy is one of the reasons why the energy systems in the Nordic countries work well and have reduced greenhouse gas emissions. Nordic co-operation on energy will continue to focus on energy efficiency. Energy consumption by households, companies and end-users in various sectors will be kept down by energy efficiency, technology and behavioural changes.

Work on the EU/EEA regulations for ecodesign and energy labelling contributes to the close Nordic co-operation on energy. It is crucial that we work together to ensure that Nordic conditions are considered and safeguarded in the EU regulations, especially for strategic Nordic products such as heat pumps because of the unique Nordic climatic conditions and industries. Nordic manufacturers, importers, retailers, consumers and official agencies will benefit from working together on ecodesign and energy labelling continuing under the auspices of Nordsyn.

Working together on energy policy and market monitoring, ecodesign and energy labelling eases the heavy administrative burden in this area on the individual countries and provides an opportunity to influence European work on energy efficiency. Co-operation in the environmental sector will be even closer so that the requirements placed on Ecodesign are better balanced and incorporate criteria for resource efficiency, e.g. design of products that can be repaired and recycled.

2. The Nordic supervisory authorities work together in Nordreg.

The Nordic Working Group – Nordsyn³ is an effective vehicle for working together to implement EU/EEA legislation on ecodesign and energy labelling, legislation that has helped make significant improvements to energy efficiency. The European Ecodesign Directive has successfully delivered energy savings (approximately 9% of expected energy consumption in the EU in 2020 and 16% in 2030).⁴ A corresponding Nordic calculation suggests that the Region will save 246 TWh/year in 2030⁵ in primary energy, albeit there is a degree of uncertainty surrounding this figure.

An active consumption side can also contribute to energy efficiency/savings and the flexibility required to maintain a stable electricity system. The supply side is based to a greater and greater extent on energy produced from varying renewable sources. Working more closely together on flexible consumption will provide flexibility for the entire Nordic electricity system. Well-balanced ecodesign requirements (e.g. flexibility and reporting systems) for relevant products (solar cells, boilers and hot water tanks) can help make the energy system more flexible. All in all, it is essential, therefore, to find business cases (e.g. purchase and aggregation of less flexible capacity on the consumption side) and framework conditions that promote all of the above initiatives on the consumption side in a way that benefits the operation and stability of the energy system, at the same time as the consumption side is accommodated. The interplay between the individual products' energy efficiency in ecodesign and the energy system must be considered as a whole. With their high proportion of renewable energy in the energy system, the Nordic countries have adjustable production and now also several forms of non-regulated energy production, which put us in an excellent position to contribute to overall assessments of the situation and new developments. Well-insulated accumulator tanks, hot water tanks and heat pumps can help stabilise voltage quality locally and frequency management centrally.

Circular thinking about the utilisation of residual heat can form the basis for Nordic synergies by promoting and strengthening co-operation between the various relevant stakeholders in the Region, e.g. industries with accessible residual heat resources, district heating companies and commercial players with possible residual heat applications. Developing solutions for the recovery and use of residual heat can increase energy efficiency and make the Nordic Region more competitive.

The energy sector's work with energy efficiency, technology and behavioural changes supports Our Vision's strategic priorities of a green and competitive Nordic Region, in particular Objective 4.

3. Nordsyn is a joint body made up of the Nordic energy authorities.

4. Environmental impact assessment. OVERVIEW REPORT 2018, VHK for the European Commission.

5. Nordcrawl3 – a web-based tool to calculate energy savings from ecodesign and energy labelling policies in the Nordic countries, TemaNord 2021:523.

The green transition of the transport sector

Focus on the energy sector

The transport sector plays a key role in relation to the countries' ambitious climate targets. During the period covered by this programme, priority will be given to working more closely together on transport across subject areas as per the objectives outlined in the Nordic vision. An efficient transport system requires specific initiatives to create effective solutions and close co-operation across the Nordic Region. In this context, it is important that industrial actors have the opportunity to develop and test new solutions that can break new ground in the green transition of the transport sector.

The main focus in the energy sector will be on the aspects of transport that are closely linked to energy policy, e.g. electrification and the use of biofuels, as well as on transport by land, sea and air. Possible focus areas include the potential for Power-to-X, standardisation, infrastructure, relevant framework conditions and public-sector instruments, business models and impact on the Nordic electricity market.

It would be natural to base the work on the existing transport activities under the auspices of the Nordic Council of Ministers, which the countries have prioritised. This same applies to the transport-related work under the auspices of Nordic Energy Research (NEF), as technical input from NEF can add to knowledge about transport and facilitate closer co-operation and coordination of the countries' policy development in the area. This can strengthen Nordic positions of strength and create a strong foundation for meeting the national climate targets in an effective manner.

Intersectoral co-operation on transport

Closer intersectoral co-operation is an important prerequisite for the green transition in transport, as clearly reflected in the Nordic vision's ambitions for transport. At the moment, no formal co-operation exists on transport under the Nordic Council of Ministers. For the period 2021–2024, funds have been earmarked for "Green transition of the transport sector", an intersectoral initiative funded by the Council of Ministers for Nordic Co-operation (MR-SAM). MR-SAM has decided that the Nordic Council of Ministers for Sustainable Growth (MR-VÆKST/Energy) will have the primary responsibility for this work. In addition to the Nordic Council of Ministers' energy sector, the environment and climate sector, the regional sector, the FJLS (fisheries, agriculture, food and forestry) sector and the business sector will all participate in this work.

In addition to the funds from MR-SAM, MR-E has decided to contribute to the cross-sectoral transport work in the action plan with additional funds from the Energy sector's budget. To ensure support in the relevant sectors, an intersectoral steering group has been set up, which is responsible for making recommendations on the funding of transport projects for EK-E. Projects that receive funding must help generate solutions that will make

the transport sector fossil-free and improve Nordic co-operation on developing and promoting green fuels, electrification and infrastructure. Projects must also generate technical knowledge that helps cut emissions by the transport sector.

The energy sector's work on this initiative supports Our Vision's strategic priorities of a green and competitive Nordic Region, in particular Objective 1.

Energy research – green transition via greater research collaboration

The overall purpose of Nordic co-operation on energy research is to strengthen the Nordic Region's international competitiveness, increase exports of Nordic energy technology and system solutions and support the green transition of the energy sector in the Nordic Region. It also helps the countries achieve their national climate goals.

The core of Nordic co-operation in the field of energy research consists of managing and continuing Nordic Energy Research's (NEF) work with other Nordic sources of research funding. NEF works by identifying and taking as its starting point areas of shared interest for the Nordic countries. The focus is on striving to generate added value and Nordic synergies in joint Nordic energy research programmes. By NEF working with other Nordic sources of research funding, a multiplier effect can be created for the funds that the countries invest.

NEF strives to achieve the above goals by:

- issuing calls for multi-year research programmes to shed light on the necessary social, technological and innovation challenges that the Nordic Region faces in the field of energy
- setting up expert and network groups to identify the most relevant areas of co-operation
- drawing up analyses and forecasts for the energy sector in the Nordic Region to evaluate and prioritise future initiatives and achieve policy objectives, e.g. for economic growth, security of supply and the climate
- collecting, analysing and disseminating data concerning the Nordic energy system.

During the period covered by this programme, research collaboration will include working with a range of actors in the energy sector and industry. The Nordic Council of Ministers' Electricity Market Group (EMG), the Working Group for Renewable Energy (AGFE) and the Network Group on Carbon Capture, Utilisation and Storage (NGCCUS) will be involved on an ongoing basis. It may also be relevant to work with other Nordic Council of Ministers' sectors, e.g. Business Policies, the Environment and Climate as well as Regional Policies.

Areas considered particularly interesting in energy research in the years to come include digitalisation of the electricity supply grid, energy storage, CCUS, green hydrogen, offshore wind, fossil-free transport, energy

efficiency, energy systems in sparsely populated areas and the energy market of the future. Priority will also be given to ensuring that Nordic co-operation on innovation and research is in line with initiatives under the European Green Deal.

However, the various national funding sources and research environments may develop areas of particular interest in relation to political priorities. As such, the exact detail of the planning of activity in Nordic energy co-operation will also be continuously adapted.

The energy sector's work with this initiative Our Vision's strategic priorities of a green and competitive Nordic Region, in particular Objective 1.

Nordic energy co-operation in Greenland, the Faroe Islands and Åland

The ambition for the programme is to integrate areas outside of the central Nordic energy grid into the Nordic co-operation on energy policy. For these areas, as with the rest of the Nordic Region, the co-operation will seek to contribute to energy systems that support an intelligent, green, low-emission economy with high competitiveness and security of supply. This applies to Greenland, the Faroe Islands and Åland, of course, but the work will also be relevant for Iceland.

The programme will also focus on the potential for supporting these areas' priorities (strategy/agendas) and on creating greater Nordic added value through synergies. The whole of the Nordic Region will be used as a test area to develop and test new energy solutions related to the respective positions of strength. This will help the Nordic Region strengthen its position as a global leader in the energy area.

Åland is part of the single Nordic electricity market and is working, for example, on the development of smart electricity systems. However, Nordic co-operation on energy must also contribute to concrete solution-oriented activities tailored to areas not linked to the Nordic system.

These areas usually have a greater dependence on oil. Integrating fluctuating renewable energy sources can be more difficult to implement in a smaller, closed electricity system.

Among the challenges that can be focused on is the development of innovative green solutions that will facilitate a massive expansion of renewable energy, e.g. wind power, and contribute to the electrification of society. Heating systems and transport on land can be electrified, as well as some forms of transport by sea, e.g. by expanding shore power to ships in ports.

Developing the electricity system and the grid (capacity, stability and storage) will be steps on the way to coping with the large increase in electricity generation and consumption. For example, in the Faroe Islands, there is a strong focus on energy storage in relatively large pumped hydro storage plants, which is a cost-effective method of long-term storage and

provide the desired stability in the islands' isolated electricity system.

Fluctuations in electricity production can also form the basis of indirect electrification by utilising green surplus production to produce hydrogen, which can be included in the development of electrofuels/Power-2-x for maritime and industrial use.

A COMPETITIVE NORDIC REGION

Energy is a significant expense for many companies. This makes a system that works well, is cost-effective and has a high degree of security of supply crucial for the Nordic Region's competitiveness. Nordic co-operation on energy helps reduce costs, e.g. by working together on the electricity market to strengthen competition, digitalisation and efficiency.

The Nordic Region's position as a pioneer in green energy technology and green energy systems provides ample opportunity to increase exports. Nordic energy co-operation, which brings the various positions of strength into play, helps Nordic companies be more competitive. Exports help promote the green transition in Europe and globally so that the work not only has an impact on the Nordic countries' climate footprint but also helps make significant cuts to emissions in other parts of the world.

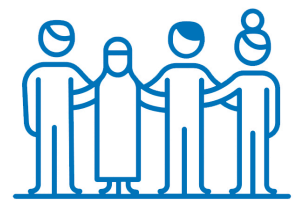
The Nordic countries also work together to develop new technologies that can improve the conditions for energy technology exports and make Nordic companies more competitive, e.g. via the electricity market co-operation, digitalisation, Nordgrid, research, hydrogen, CCUS, electrofuels, offshore wind power, etc.



A COMPETITIVE NORDIC REGION. *Together, we will promote green growth in the Nordic Region, based on knowledge, innovation, mobility and digital integration.*

A SOCIALLY SUSTAINABLE NORDIC REGION

The Nordic countries have a tradition of and a political desire for sustainable development, and the focus on the climate and the green transition enjoys broad support. However, when it comes to implementation, there have already been examples of popular resistance that can delay or prevent the expansion of renewable energy or energy infrastructure in certain areas. The green transition will lead to significant changes in energy production and consumption, transport, physical planning and large installations on land and at sea. Lack of popular support can slow down and block these developments. For the green transition to be successful, it must take into account social balance and a high degree of acceptance. Knowledge and experience of these processes will, therefore, be absolutely crucial.



A SOCIALLY SUSTAINABLE NORDIC REGION. *Together, we will promote an inclusive, equal and interconnected region with shared values, more cultural exchanges and welfare.*

The value of close co-operation with Nordic neighbours includes that the countries benefit from each other's experiences. The aim in this area is, therefore, to acquire knowledge, systematise experiences, communicate with each other and produce proposals for good solutions.

Three themes have been prioritised for this work under the theme of a socially sustainable Nordic Region:

1) Acceptance of new energy facilities

Social acceptance, public involvement and regional support for the green transition require analytical capacity, including greater understanding of the effects of inclusive energy policies such as involvement, planning and co-ownership. Possible initiatives to make new plants more socially acceptable can be identified and presented in a catalogue of ideas. Objective 10 in the Action Plan says that all parts of the Nordic Region must be involved in the green transition. The ability to analyse the level of social acceptance, citizen engagement and regional support will help achieve this goal.

2) The effects of the green energy transition on wealth distribution

The transition to green energy will be felt differently in rural and urban areas as well as in different population groups due to different effects on wealth distribution. Objective 10 of the Action Plan stipulates that work on a socially sustainable green transition must not increase inequality in the Nordic Region. All regions must be involved in the green transition, which must not exacerbate the differences between, for example, urban and rural areas. By studying the potential effects of the energy transition on wealth distribution, the Nordic countries will increase their analytical capacity, which will help to ensure that social differences are not exacerbated.

3) Gender equality

One of the points under Objective 10 in the Action Plan stipulates that the Nordic Council of Ministers will support research into how to increase the proportion of women in the energy sector in order to maintain social balance during the green energy transition. The action plan states that gender equality is one of the preconditions for an inclusive transition.

The energy sector's work on this initiative supports Our Vision's strategic priorities of a green and competitive Nordic Region, in particular Objective 10.



Co-operation on EU issues and with other international actors

EU/EEA affairs and other international energy issues have been on the agenda since the start of official Nordic co-operation on energy and remain a top priority. In many energy arenas, Nordic co-operation and coordination can enhance Nordic influence and our ability to see processes in the EU and the EEA to a successful conclusion. The Nordic countries have different levels of engagement with European co-operation but benefit significantly from working together on issues of common interest on the EU and EEA agendas. This was one of the main points made in Jorma Ollila's strategic review of Nordic energy co-operation in 2017. The EU has also scaled up discussions on energy in the last five years, which has thrown up new challenges as well as opportunities for Nordic co-operation.

The ambition in 2014–2015 was to develop closer co-operation on energy policy in the EU through the EU Energy Union. One of the ways to achieve this was to adopt a new set of rules in the form of the “Clean Energy for all Europeans” package.⁶ This set of rules still plays a vital role for the Nordic countries in the ongoing work on energy policy issues up to 2030. The EU is already revising these provisions via its “Fit for 55” package and the European Green Deal. Norway and Iceland are also affected by EU legislation through the EEA Agreement.

The Nordic Region has wide-ranging competences and positions of strength in all of the dimensions included in the EU's Energy Union, the Clean Energy for all Europeans package (CEP) and the European Green Deal, including the proportion of renewable energy, proactive energy efficiency policies, electricity market design (degree of interconnection), security of supply and technological level.

6. Several acts were included in the EU's “Clean Energy for all Europeans” package, which was adopted in 2018 and 2019, e.g. in electricity market design, energy efficiency, renewable energy and the National Energy and Climate Plans (NECPs).

European Green Deal and Nordic energy challenges

The European Green Deal (EGD), which was proposed in December 2019, has generated new momentum in energy policy, both at European and regional levels. The goal of the EGD is to ensure that the EU achieves its objective of energy neutrality by 2050. According to the EU's own analyses, to succeed in this endeavour, the targets for the period up to 2030 need to be significantly increased from the level of ambition in the EU Energy Union. To achieve climate neutrality by 2050, via a 55% reduction in greenhouse gas emissions by 2030, the proportion of renewable energy used in the EU will also need to go up by almost 40% and energy efficiency be improved by up to 36% for end-users and 29% for primary energy by 2030. This represents a significant increase on the EU targets set out in the CEP and associated legislation from 2018. The critical deadline is 2030. In this work, a revision of the directives on energy efficiency and renewability will play a key role from 2021–2022. Other acts such as the Energy Performance of Buildings Directive and the Natural Gas Directive will also be revised via the "Fit for 55" package in 2021. These are all pieces of legislation that are being negotiated and will move into the implementation phase.

European Green Deal initiatives and Nordic energy vision towards 2030 and 2050

During the period 2022–2024, the Nordic countries will, in particular, follow the work on the revision of the energy regulations and the work on new targets for 2030 under the European Green Deal (EGD). Several initiatives proposed as part of EGD will affect the realisation of the regional Nordic energy vision for 2030. This makes closer Nordic co-operation between political bodies, market participants, research communities and civil society even more relevant.

Under the EGD, the Nordic countries will be able to establish and adapt existing regional co-operation on themes such as renewable energy (including offshore wind), energy efficiency (including "energy efficiency first"), ecodesign (including Nordsyn), the Energy Efficiency Directive (EED), energy efficiency in construction and renovation, hydrogen, smart system integration, national energy and climate plans (NECPs) and the further development of the electricity market and infrastructure. Research, development and innovation will support the roadmaps horizontally in key areas such as hydrogen, CCUS and offshore wind. Nordic Energy Research (NEF) can provide support to working groups and projects in connection with these roadmaps so that the Nordic Region as a whole is better equipped when EU/EEA initiatives reach the negotiation and implementation phase.

The EGD has already been strongly affected by the political response to the COVID-19 pandemic and will be strengthened in several areas by financial

instruments and opportunities for grants and loans through Next Generation EU. In the period 2022–2024, Nordic co-operation on energy will benefit from an exchange of information and experiences on how initiatives such as Next Generation EU affect the key co-operation themes, markets and instruments.

Co-operation with the Baltic countries and relations with other regional co-operation forums

The already established contact with the Baltic countries will be continued as part of the vision for 2030. Nordic co-operation on energy will also continue to invite the Baltic states to selected events when the countries have shared interests. This co-operation has in particular been linked to issues related to EU energy policy. Attempts will be made to develop the co-operation with neighbouring countries, especially with the three Baltic states, through both the Baltic Energy Market Interconnection Plan (BEMIP) and Nordic N-8 initiatives. Closer co-operation on energy technology with the Baltic states will also be assessed on the basis of NEF's work with Baltic Energy Technology Perspectives.

One of the ambitions outlined in Our Vision 2030 is actively to utilise the strength of the joint Nordic voice in both formal and informal forums. This is especially true in the EU/EEA, but also in other forums in which the Nordic countries participate, for example, BEMIP⁷. Various forms of regional co-operation also take place in forums, where, for example, system operators and independent regulators participate, and at European level through the European System Operators (ENTSO-E) and the co-operation between the European national regulators in ACER.

Other forms of international co-operation

The Nordic countries also participate in other, more global forms of co-operation on energy policy, such as the International Energy Agency (IEA) and the International Renewable Energy Agency (IRENA). Internationally, it can be an advantage for the Nordic countries to act together when they have common interests.

The IEA and Nordic Energy Research (NEF) conducted a technological study, Nordic Energy Technology Perspectives (NETP), which showed that the Nordic countries are well advanced in the green transition and have a number of positions of strength that can be used to advantage on a global basis in terms of both exports and promotion of joint Nordic political positions. Under this programme, the focus on supporting Nordic global

7. BEMIP – Baltic Energy Market Integration Plan.

energy solutions will continue.

The Nordic initiatives under Clean Energy Ministerial/Mission Innovation (CEM9/MI3) are successful examples of how Nordic co-operation on energy can support and develop global initiatives, can be used to put Nordic priorities on the international energy policy agenda and can showcase Nordic solutions and technologies. Closer co-operation will help attract summits and conferences to the Nordic Region and enhance the region's role as a major global player in the green transition.

The energy sector's co-operation on EU affairs and with other international actors supports Our Vision's strategic priorities of a green and competitive Nordic Region, in particular Objective 5.



How the co-operation is organised

Nordic energy co-operation consists of the Nordic Council of Ministers for Growth (MR-VÆKST), the Committee of Senior Officials for Energy Policy (EK-E), Nordic Energy Research (NEF), the working groups for the electricity market (EMG) and renewable energy (AGFE), as well as the Working Group for Energy Efficiency (NGEE), the Regulatory Working Group for Nordsyn (MANO) and the networking group for CCUS (NgCCUS). The working groups and networks have political remits, which are regularly renewed to guarantee relevance, both nationally and internationally. Temporary steering groups, expert groups, etc., are also regularly set up for specific projects or activities to ensure national support.

Assisted by NEF and the Nordic Council of Ministers' Secretariat, the EK-E conducts annual evaluations of the efforts to fulfil the purpose behind energy co-operation's seven focus areas. The results take the form of concept notes.

EK-E continuously assesses whether the established structure of working groups etc. is suitable for the work done by Nordic co-operation on energy. In the period covered by this programme, this will involve assessing, for example, whether new tasks concerning hydrogen, Power-2-X or energy efficiency will necessitate a reorganisation.

How the sector is organised

Nordic Council of Ministers for Sustainable Growth – Business, Energy & Regional Policies (MR-VÆKST/Energy)

MR-VÆKST/Energy is the highest decision-making body in energy policy co-operation. The Nordic energy ministers sit on it along with the ministers for regional and business policies.

MR-VÆKST/Energy adopts the strategic direction for co-operation on energy policy. The energy ministers usually meet once a year. These

meetings pave the way for political discussions and serve as an arena for discussing experiences and developing new forms of collaboration. The chair rotates between the Nordic countries on an annual basis.

The Nordic Committee of Senior Officials for Energy Policies (EK-E)

The EK-E has the technical and administrative responsibility for the energy sector's activities and works closely with the Secretariat of the Nordic Council of Ministers. The chair of the EK-E rotates in line with the Presidency of the Nordic Council of Ministers, and the chairperson is responsible for leading the work of the EK-E. The Committee serves as a forum for colleagues to discuss knowledge and experiences and create opportunities for policy development in the individual countries and across national borders in the Nordic Region. The EK-E is responsible for following up on the implementation of the co-operation programme.

The Secretariat of the Nordic Council of Ministers

The Secretariat of the Nordic Council of Ministers coordinates Nordic co-operation on energy policy and supports the Nordic countries' work in this field, mainly by providing administrative support to the annual Presidency of the Nordic Council of Ministers. The Secretariat also plays a special role in promoting inter-sectoral co-operation between the sectors in the Nordic Council of Ministers.

Nordic Energy Research (NEF)

Nordic Energy Research is the energy sector's research institute and a key player in the implementation of the co-operation programme. NEF helps develop knowledge and competences in strategically important areas and acts as a link between research and policy development. NEF serves as the administrative body for several projects initiated by the EK-E and is the secretariat for EMG, AGFE and NGCCUS. NEF works with the EK-E and the working groups to plan and run activities necessary for the implementation of the programme and to disseminate knowledge and the results of the work. NEF's remit is set out in section 4.3.

The Electricity Market Group (EMG)

The electricity market group is a working group under the Nordic Council of Ministers. NEF acts as its secretariat. The group commissions analyses, advises the Nordic energy ministers and is responsible for organising the annual Nordic Electricity Market Forum, at which relevant players contribute to the development of the Nordic electricity market. The working group consists of experts from the ministries and energy authorities in Denmark, Finland, Norway and Sweden – the four Nordic countries participating in the single Nordic electricity market.

Working Group on Renewable Energy (AGFE)

The overall objective of AGFE's work is to promote the use of renewable energy in the Nordic Region and support the Nordic countries' work in this area. AGFE strives to ensure a smooth integration of renewable energy into

the energy systems and create good conditions for developing technology and innovation in renewable energy. The group commissions analyses, advises the Nordic energy ministers and discusses experiences of issues such as the implementation of EU directives on renewable energy.

Nordsyn

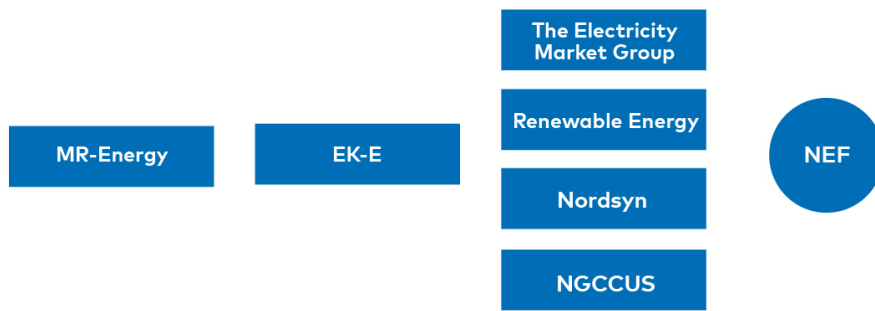
Nordsyn is a working group under EK-E. It is made up of national policy and supervisory bodies for ecodesign and energy labelling.

Nordsyn's overall objective is to promote Nordic co-operation on policy-making and market supervision in the field of energy efficiency, primarily with regard to the Ecodesign Directive, the energy labelling regulation and the product regulations for both of them. This will significantly contribute to cost-effective energy savings and energy efficiency. The Swedish Energy Agency serves as the secretariat for Nordsyn.

The Nordic and Baltic (NB8) Networking Group on Carbon Capture, Use and Storage (NGCCUS)

The job of the Networking Group on Carbon Capture, Use and Storage (NGCCUS) is to promote co-operation and assist governments by keeping up with, discussing developments in and exchanging information about CCUS in the Nordic Region and within the framework of Nordic-Baltic co-operation (NB8).

Organisational chart for energy co-operation



Co-operation with civil society and business

During the period covered by the programme, Nordic energy co-operation will actively work with public and private actors towards the fulfilment of Our Vision 2030 and the goal of climate neutrality in 2050, e.g. by continuing the annual electricity market forum, at which all of the relevant actors work together.

As part of the annual planning of the work, the EK-E will decide how best to involve civil society and business in energy co-operation, including via information, consultations, discussions and public consultations.

Implementing inter-sectoral strategies

Agenda 2030

The co-operation programme supports the UN Sustainable Development Goals (SDGs) and is designed to help the Nordic Region meet Agenda 2030 targets. The seven focus areas support both agendas, which is why the energy sector – due, for example, to it working together on the green energy transition and the single Nordic electricity market – is crucial to the development of varying renewable energy (SDG 13). Similarly, the seven areas together and individually contribute to the goals of health and well-being (SDG 3), sustainable energy (SDG 7), decent jobs and economic growth (SDG 8), industry, innovation and infrastructure (SDG 9), sustainable cities and communities (SDG 11) and responsible consumption and production (SDG 12).

Gender equality

The co-operation programme focuses closely on the Nordic Council of Ministers' horizontal strategy and initiative to prioritise gender equality in its project work. In the period covered by this programme, Nordic energy co-operation will strive to incorporate thinking about gender equality into all NEF projects and activities in order to profile the many talented and professional women in the sector.

Children and young people's rights and/or living condition

Nordic energy co-operation is also aware of and keeps an eye on the well-being of children and young people and utilises their competences to create a more green and socially sustainable future. One of the driving forces in local communities will be children and young people, who in recent years have shown themselves to be ready to take the lead in terms of behavioural change and seeking out new green alternatives.

Where relevant, all of the actors who contribute to the implementation of the co-operation programme must integrate these inter-sectoral dimensions into their work.

Nordic Energy Research (NEF)

The strategic mandate for NEF is adopted by the Nordic energy ministers. It sets out the overall framework for NEF's work to promote and further expand Nordic energy-related co-operation for 2022–24.

The mandate must be seen in addition to the articles of association, which stipulate the overall general objectives, fields of work and regulatory framework for NEF. Its actual activities are specified by the applicable three/four-year strategy for NEF, the co-operation programme and action plans for the energy sector, annual grant letters, the annual budget, and the Nordic Council of Ministers' vision and action plan.

The strategic mandate for Nordic Energy Research (NEF) 2022–2024

As a Nordic institution, NEF will focus in the period 2022–2024 on the goals set in the Vision for Nordic co-operation and the Action Plan for the period 2021–2024 and its twelve objectives.

At the same time, NEF must also work towards the goals and ambitions in the energy sector's co-operation programme 2022–24, which will be stated annually in the budget for Nordic co-operation and NEF's grant letter.

A Nordic institution

As a Nordic institution, NEF must:

- Contribute to Nordic synergies and create Nordic and national added value on top of the purely technical results of co-operation
- Base its work on co-operation on energy solutions and energy policy in the Nordic countries. These activities are closely related to Nordic co-operation in related areas, including climate, the environment and business
- Offer expertise, administrative support and interdisciplinary

perspectives on work and processes initiated by the Council of Ministers whenever energy-related expertise is relevant.

Key areas of work for NEF

Using the funding and resources entrusted to it, NEF must:

- Bring national funding sources and foundations together to work on joint Nordic research initiatives in the field of energy, as well as Nordic co-operation through European research initiatives and programmes. NEF uses part of its basic grant from the Nordic Council of Ministers to initiate this work, while the research initiatives are usually funded directly by national funding bodies and foundations.
- Provide politically relevant expertise, analyses and knowledge as part of the basis for political decision-making processes. To a significant extent, this can be done by issuing calls for projects and programmes so that the most competent Nordic companies and institutions are involved in the work.
- Assist the Nordic Council of Ministers and the Secretariat in Copenhagen in ensuring coherence and Nordic synergies in the implementation of the energy sector's work on the Nordic vision. This includes incorporating inter-sectoral perspectives into the work, both in connection with actual inter-sectoral projects and coordinating the work of more sector-specific activities with projects in other sectors so that synergy effects are achieved rather than overlap. This is especially true for the environment and climate sector but also for other sectors that work on energy-related issues.
- Strengthen Nordic energy co-operation through networks, forums and working groups made up of officials, energy experts and researchers.
- Help give the Nordic Region a professional/authoritative voice and, in doing so, raise the profile of Nordic energy co-operation at international level.
- In addition, NEF can also support inter-sectoral work by acting as an administrative body for other sectors, which could benefit from its competences in implementing their own or inter-sectoral action plans, e.g. the environment and climate sector, which also works on energy-related questions.

Budget

The Nordic Council of Ministers funds NEF. It receives both a basic grant and funding for specific projects and activities. It also receives money from the Nordic countries and their national funding bodies as well as from other public or private sector partners.



Evaluating the programme

In order to ensure effective and targeted follow-up of political priorities, including on indicators, regular follow-up work will be done on progress and on updating the energy sector's initiatives in connection with the action plan for Vision 2030. For the seven focus areas, each strategic initiative will be followed up on annually and decisions taken on activities to support the initiative in the following year.

In 2023, an overall evaluation of the whole co-operation programme will be conducted as part of the basis for drawing up a new co-operation programme.

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Nordic co-operation

Nordic co-operation is one of the world's most extensive forms of regional collaboration, involving Denmark, Finland, Iceland, Norway, Sweden, the Faroe Islands, Greenland, and Åland.

Nordic co-operation has firm traditions in politics, the economy, and culture. It plays an important role in European and international collaboration, and aims at creating a strong Nordic community in a strong Europe.

Nordic co-operation seeks to safeguard Nordic and regional interests and principles in the global community. Shared Nordic values help the region solidify its position as one of the world's most innovative and competitive.

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