European Policies Research Centre

STRATEGIC ENVIRONMENTAL ASSESSMENT: NORTHERN PERIPHERY AND ARCTIC PROGRAMME 2021-2027

DRAFT ENVIRONMENTAL REPORT

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NON-TECHNICAL SUMMARY

The Northern Periphery and Arctic (NPA) is a well-established, widely supported transnational cooperation programme funded through the European Regional Development Fund. The 2021-2027 NPA programme aims to support communities in the Arctic and the high north of Europe to develop their economic, social and environmental potential. It does so by funding cooperation projects among different territories with similar challenges and development potential. The eligible regions are located in Finland, the Republic of Ireland, Sweden, Greenland, Iceland, the Faroe Islands and Norway.

The currently proposed 2021-2027 NPA Programme focuses on three priority areas: 'Innovation', 'climate change adaptation, and resource sufficiency' and 'institutional capacity of public authorities and stakeholders (with a view to the implementation of Arctic policies)'. All of these priorities consider issues related to sustainable development with a focus on the needs of remote and peripheral communities. The NPA and its predecessor Programmes have retained consistency in this rationale, taking into account territorial strengths and the protection of natural and cultural resources. The Programme has also proved capable of responding to major change and challenges, including the dramatic impacts of climate change across the High North.

While the eligible territories are faced with similar challenges, each country or region within the NPA programme area has a distinct environmental profile that both conditions and supports the programme's development. Relevant environmental themes are thus analysed in this environmental report to emphasise relevant data and trends. Competent authorities in participating countries have collaborated in the identification of these factors. A SWOT analysis was developed summarising the principal environmental strengths, weaknesses, opportunities and threats to be considered within the programming process. From this methodology, three strategic environmental issues were identified.

Physical environment and biodiversity in the Arctic and High North are associated with a range of challenges and potential negative impacts. There are significant pressures from agricultural activities, logging and wood harvesting, as well as from urbanisation and tourism, which are expected to increase with greater accessibility to these regions. Coastal and marine environments are particularly under pressure from pollution, agriculture, fishing, shipping and climate change. This leads to habitat loss and significant threats to different species. Protected areas are thus vital to halt the loss of the natural environment and biodiversity.

The programme area is abundant in natural resources such as forests, fish, mineral ores, mineral oil and gas, but also renewable energy resources. These form a basis to the economies of the area, but there are significant environmental challenges linked to the extraction of natural resources. Another significant economic sector is that of nature and cruise tourism, which can frequently cause tensions between economic interests and environmental protection, and has increased concerns regarding the overcrowding of certain natural areas of interest, especially in connection with the traditional 'right to roam' in the Nordic countries. To curb some of the more negative and unsustainable patterns of consumption, NPA countries are investing in renewable energy sources and working towards improving the circularity of their economies to reduce the generation of waste, use of energy and need to extract new materials.

Climate change is having a devastating impact on the NPA area.The Arctic is particularly vulnerable to climate change given the ice-albedo feedback and the rapid increase in temperature. This

sensitivity is resulting in the loss of biodiversity, increased river levels due to higher rates of rainfall, smaller and less glaciated areas, fewer areas with permafrost, and more extreme weather events threatening coastal communities. Due to these issues, climate change is a common focus in bilateral and multilateral programmes and networks across the area (e.g. Working Groups in the Arctic Council) and each NPA country has set ambitious goals toward cutting carbon emissions. Positive results will also rely on changes in behaviour and consumption patterns and environmental protection efforts.

This strategic environmental assessment considers the Programme's visions and priorities for their alignment with broader strategies, namely the European Green Deal and the EU's Eighth Environmental Action Programme. There is a clear conformity between these policy frameworks at international and EU level and the national and regional strategies and NPA programme objectives. Each of these objectives was assessed for impacts on the strategic environmental issues identified. Overall, positive effects on the environment are expected within the priority objectives. Regarding priority 1 on strengthening innovation capacity in NPA communities, the expected impact on the environment is limited, with a positive potential. This could be enhanced if innovation is considered in tandem with environmental issues. Particular concerns are related to the sustainability of the funding for the tourism sector. Effective management must therefore be employed to ensure sensitive habitats and species are monitored and protected, and to reduce overcrowding. The provision of online services and internet connectivity may also reduce travelling and save energy and carbon emissions.

Regarding priority 2, on climate change adaptation and resource sufficiency, the expected impact is considered positive, especially if the Programme continues investing in soft measures (e.g. local capacity development) and achieves goals in net energy savings in the face of increased energy demand. The construction of infrastructures for energy generation and transmission and mining may lead to further ecosystem destruction. Taking a broader perspective on the concept of the circular economy will also help achieve the best possible environmental impact, lessening pollution and resource consumption.

Finally, regarding priority 3, on institutional capacity of public authorities and stakeholders, the expected impact is also positive. There are increasing possibilities for effective participation of local communities in decision-making and capacity-building, and the promotion of cultural heritage. Nonetheless, potential conflicts of interest between economic development and environmental protection – namely regarding mining, tourism fisheries/aquaculture and shipping – must be considered, especially in such a sensitive area like the Arctic. Utilisation of sustainable aquaculture and fishing practices, management of visitors and assessment of, e.g., cruise ships, may mitigate possible negative effects.

The use of indicators is required to ensure an effective and sufficient monitoring. These should be suitable for the evaluation of effectiveness in addressing strategic environmental and the contribution of the NPA programme overall. Different potential indicators are thus provided according to the different priority objectives stipulated.

1 STRATEGIC ENVIRONMENTAL ASSESSMENT IN CONTEXT

1.1 OBJECTIVE

Strategic environmental assessment (SEA) is a procedure to determine likely significant environmental impacts of certain strategic plans or programmes at an early stage, when decisions have not yet been taken. The requirement to carry out a Strategic Environmental Assessment (SEA) applies also to the Northern Periphery and Arctic Programme (NPA).

Besides the identification and mitigation of potential negative impacts of a plan or programme on the environment, scope exists within the application of SEA to create targeted positive environmental impact. This means going beyond the protection of the environment in a proactive manner to secure environmental gain, defined as the attainment of environmental benefit as a direct or indirect result of economic development activity.

Evaluations of past NPA programmes have demonstrated primarily positive environmental impacts resulting from programme interventions. With this in mind, the SEA of the NPA aims at identifying both potentially negative and positive programme impacts, which could be enhanced.

1.2 SUMMARY OF THE CONTENT OF THE NPA PROGRAMME 2021-27

The 2021-2027 NPA Programme provides a framework for the countries and regions to cooperate within a functional area defined by common issues, working in a way that recognises the particular challenges and approaches to cooperation necessitated by the geographical characteristics of the area. The Programme encourages effective cooperation to maximise place-based development linking areas facing shared or similar development challenges, enabling them to, e.g. build on advantages in sparsely-populated communities, and find innovative solutions to their linkage into larger markets and more populated areas. This gives the Programme a distinct role in relation to other forms of cooperation.

The Northern Periphery and Arctic (NPA) Programme is a **well-established, widely supported transnational cooperation programme** funded through the European Regional Development Fund. The Programme, and its predecessor Northern Periphery Programmes, have demonstrated clear achievements and results (Wergles, 2014; McMaster et al., 2015; McMaster et al., 2012). Over a succession of programme periods, the Programme has consistently delivered projects and results directly benefitting remote and peripheral communities across the programme area and building durable transnational networks of learning, knowledge and expertise across the region and beyond. The NPA and its predecessor Programmes have retained consistency in their strong rationale and focus on the needs of remote and peripheral communities, capitalising on territorial strengths and change. A very strong aspect of this has been work around environmental protection and sustainable development adapted to the

specific environmental needs and demands of remote and peripheral areas. The Programme has also proved capable of responding to major change and challenges, including the dramatic impacts of climate change across the High North in particular.

1.2.1 Programme area

Territories in seven countries participate in the Programme: the EU Member States of Finland, Republic of Ireland, Sweden and the Non-EU Member States of the Faroe Islands, Greenland, Iceland and Norway.

The programme area covers diverse landscapes, ranging from mountainous regions and large forests to long coastlines and islands. Harsh and extreme climatic conditions are a common feature, with many regions experiencing long cold winters. A large part of the Programme area lies within the Arctic, but it also includes non-Arctic areas of Norway, Sweden, Finland, Iceland, Ireland and Faroe Islands. The territories covered in the analysis are listed in detail in **Error! Reference source not found.**.

Amplified by extreme environments and geography, **peripherality from major economic centres and sparse populations** are defining characteristics that present a functional rationale for cooperation across the territory.

- The NPA area has **notable regional centres** such as Tromsø, Umeå, Oulu, Reykjavik and Galway. However, in contrast to the high levels of urbanisation and connectivity across much of the EU, the **scale of distances to and between centres, physical barriers, and cost of transport** are key factors shaping development across the NPA area, see **Error! Reference source not found.**. For example, in Pohjois- ja Itä-Suomi in Finland, in Övre Norrland and Mellersta Norrland in Sweden, and in Nord-Norge and Trøndelag in Norway there is less than 2.0 km per 1,000 km² of motorway.[1]

- **Population density across the NPA regions is significantly below the EU average** of 117 people per km², e.g. North and East Finland has a population density of 6.3 people per km²; Northern Norway 5 persons per km² (Teräs et al., 2020); and Iceland 3.5 per km², see also **Error! Reference source not found.**. Greenland's population density is the lowest in the world; counting the ice-free areas only, it is 0.3 persons per square kilometre (Statistics Greenland, 2018).

1.2.2 2021-2027 NPA Programme Priorities

The Programme aims to **support communities on the extreme north of Europe to develop their economic, social and environmental potential**. It does so by funding cooperation projects, (e.g. the joint development of model solutions or transfer of good practices) among these different territories, which share similar challenges and development potentials.

The currently proposed 2021-2027 NPA Programme focuses on **three priority areas 'Innovation', 'climate change adaptation, and resource sufficiency' and 'institutional capacity of public**

[1] See https://ec.europa.eu/eurostat/cache/RCI/#?vis=nuts2.transport&lang=en.

authorities and stakeholders (with a particular view to the implementation of Arctic policies)', divided into seven specific objectives (see Figure 1). All three priorities touch upon the issues of sustainable development of community, natural and cultural resources relevant for a Strategic Environmental Assessment.

The programme drafting process has taken into account

- an area analysis which highlights the central importance of environmental opportunities and challenges to development in the area;
- extensive stakeholder consultations with a range of groups including environmental agencies and interest groups, and
- the findings of programme evaluations which have highlighted the value of the programme in relation to environmental concerns and the potential for the programme to develop this role further in the future.

The programme development process is led by a drafting team, content group and programme preparation group, and has benefitted from regular stakeholder inputs and consultations.

Figure 1. Draft Programme priorities and specific objectives

Priority 1: Strengthening the innovation capacity for resilient and attractive NPA communities

Specific Objective 1.1 - Developing and enhancing research and innovation capacities and the uptake of advanced technologies

Enhancing research and innovation capacities and the uptake of advanced technologies are of key importance for SMEs and micro enterprises, and related, the NPA area as a whole. Through innovation and pursuing higher value-added processes activities can be diversified and expanded, drawing on specialist sectoral knowledge and expertise in the area. Regional programmes and strategies, including smart specialisation strategies, which foster bottom-up policy approach for regional innovation and development can be the basis for identified key regional strengths.

In times of major change, most notably climate change, the vulnerable ecologies of the programme area place even more importance on innovation capacity as a means to adapt, manage and respond to change, and the innovation capacity is also of importance when other unforeseen catastrophes such as pandemics occur. To combat the climate change, green and blue technologies are of interest to the area.

Recognising that the innovation process can take time and involve many stages, projects can engage at various stages in the innovation cycle, from inception to testing and pre-commercial development, to expanding application and adoption. It is important to involve SMEs already when developing innovations, but also in the application of existing technologies. Examples of sectors in which the programme can finance projects are healthcare, energy, the marine economy, circular economy, transport, environmental and natural resources as well as innovation with emphasis on tourism, culture and creative industries.

Types of actions to be funded:

- Facilitating technology transfer to, or across, the Programme area benefiting SMEs, including green technologies
- Facilitating commonly identified opportunities based on strengths in the programme area supported by research and innovation, including smart specialisation strategies.

In all activities that are approved by the NPA programme, there should be an integration of the horizontal criteria. This means that the activities should strive for a performance with low carbon footprint, with equal opportunities for men and women and inclusion of underrepresented groups, including indigenous peoples and other culturally and linguistically distinct groups originating from the NPA area.

Specific Objective 1.2 - Reaping the benefits of digitisation for citizens, companies, research organisations and public authorities

Territories across the programme area experience challenges linked to long distances and access to markets and key services. Digitalisation and digital solutions are key to addressing and mitigating these challenges of importance for public service, SMEs and the communities and people who live in the area, e.g creating links between the public sector, networks of SMEs and education providers. Digitisation can help to mitigate challenges linked to demographic change, mitigate crises such as pandemics, and also create opportunities for younger population in remote and peripheral communities, e.g through remote healthcare and smart mobility. In order

to make the advantages of digitisation accessible for everyone, it is important to develop digital skills and also to build capacity in SMEs, in public service, and in organisations.

Transnational collaboration has a vital role in strengthening the expertise and experiences of working with digital solutions in the programme area, both to widen and deepen the expertise coming from these peripheral areas, and also to apply new solutions.

Types of actions to be funded:

- Transfer and development of accessible digital solutions to create better conditions for people to live and work in the area. This includes technology-driven solutions for public service provision, as well as marketing models and solutions facilitating the use of distance-spanning technology to overcome long distance to market.

In all activities that are approved by the NPA-programme, there should be an integration of the horizontal criteria. This means that the activities should strive for a performance with low carbon footprint, with equal opportunities for men and women and inclusion of underrepresented groups, including indigenous peoples and other culturally and linguistically distinct groups originating from the NPA area.

Specific Objective - 1.3 Enhancing sustainable growth and competitiveness of SMEs and job creation in SMEs, including by productive investments

Through transnational cooperation, the programme will contribute to enhancing the entrepreneurial climate of the NPA area by facilitating the transfer and development of business support strategies and solutions to overcome the particular challenges faced by start-ups and existing SMEs in remote and peripheral regions. An example is building networks and clusters with capacity to tackle the challenge with long distance to market for SMEs. Overcoming these challenges will contribute to a more dynamic business sector, in particular for SMEs in nontraditional sectors.

In the programme area, there are area-based specialisms linked to specific area-based cultural or natural resources as for example uniqueness of Arctic, islands, coastal areas etc. To manage traditional business in remote and sparsely populated areas there is a need to build economic diversification and resilience. Through innovation, traditional sectors can be diversified and expanded. A key sector for the area that has particulary high number of SMEs and micro enterprises is tourism. This is also a sector where it is important to engage indigenous groups and local communities in planning and activities.

Types of actions to be funded:

- Transfer and development of models and solutions for support to SMEs faced with commonly identified challenges and opportunities in peripheral regions with a particular focus on entrepreneurial skills and sustainable business models.
- Transfer and development of concepts for creating networks and clusters of SMEs and connecting entrepreneurial capacities across regions as well as adapting marketing models for a greater market reach.

In all activities that are approved by the NPA programme, there should be an integration of the horizontal criteria. This means that the activities should strive for a performance with a low carbon footprint, with equal opportunities for men and women and inclusion of underrepresented groups, including indigenous peoples and other culturally and linguistically distinct groups originating from the NPA area.

Priority 2: Strengthening the capacity for climate change adaptation, and resource sufficiency in NPA communities

Specific Objective 2.1 - Promoting energy efficiency and reducing greenhouse gas emissions

Territories across the programme area have high energy needs linked to their cold and extreme climates. This, in turn requires smart energy solutions, including smart energy storage. Long distances and a lack of access of communities and hubs drives the need to explore community-based systems, for example for islands and remote areas. The area has a high potential for renewable energy resources and can build on vast expertise and experience in the field and a preparedness to adopt and apply new technologies and new solutions.

Types of actions to be funded:

- Transfer and development of sustainable renewable energy generation and energy efficiency solutions suitable for cold climates and remote communities.
- Facilitating the use of place-based energy surpluses and development of smart energy management concepts in remote communities.

In all activities that are approved by the NPA programme, there should be an integration of the horizontal criteria. This means that the activities should strive for a performance with low carbon footprint, with equal opportunities for men and women and inclusion of underrepresented groups, including indigenous peoples and other culturally and linguistically distinct groups originating from the NPA area.

Specific Objective 2.2 - Promoting climate change adaptation and disaster risk prevention, resilience, taking into account eco-system based approaches

The vulnerability of the NPA regions and their geographies (sparsely populated costal-, mountain-regions and islands) makes combating climate change and climate change adaptation/resilience major challenges for the area. The specific nature and needs of these areas means it is vital to have input from specialists and local input with in depth knowledge of the unique and sensitive natural environments. The programme will support the transfer of knowledge and experiences between the regions in the programme, and the creation of new transnational networks.

Types of actions to be funded:

- Transfer and development of solutions that facilitate the use of community knowledge and builds local capacity for climate change adaptation, risk prevention and disaster resilience in sparsely populated communities.

In all activities that are approved by the NPA programme, there should be an integration of the horizontal criteria. This means that the activities should strive for a performance with a low carbon footprint, with equal opportunities for men and women and inclusion of

underrepresented groups, including indigenous peoples and other culturally and linguistically distinct groups originating from the NPA area.

Specific Objective 2.3 - Promoting the transition to a circular and resource efficient economy

The circular economy requires new solutions and innovations to transform production processes and change consumer behaviour. Crucially responses need to take into account territorial specificities, such as the impact of peripherality and extreme climates, some areas have recognised challenges in dealing with waste management, where distance and transport is an issue. For example waste is one of many aspects that could be included in actions to create circular economy. Other important aspects are resource efficiency in sectors as bio economy, blue economy, the building sector and infrastructure, food, and by-products from production.

In remote communities, there are already important strengths in this field, e.g a tradition of self-reliance, reusing and repurposing. Therefore circular, green and bio-economy are already integral parts of the NPA area. Another reason for the importance of these sectors are the high impact of pollution on sensitive environments in the NPA area.

The programme can, for example, support concepts for engaging sparsely populated areas in accessing wider networks and capacities for knowledge transfer and skills development.

Types of actions to be funded:

- Facilitating the transfer and development of solutions that promote resource efficiency, end-of-waste, and a better use of by-products in remote, and sparsely populated communities
- Facilitating the transfer and development of solutions for community planning for the circular economy in remote, and sparsely populated communities.

In all activities that are approved by the NPA programme, there should be an integration of the horizontal criteria. This means that the activities should strive for a performance with a low carbon footprint, with equal opportunities for men and women and inclusion of underrepresented groups, including indigenous peoples and other culturally and linguistically distinct groups originating from the NPA area.

Priority 3: Strengthening the organisational capacity among NPA communities to make use of cooperation opportunities

Specific Objective 3.1 - Enhance institutional capacity of public authorities and stakeholders to implement macro-regional strategies and sea-basin strategies, as well as other territorial strategies

The goal for actions to enhance organisational capacity of public authorities and stakeholders in NPA is to develop more resilient communities. This includes working with natural and cultural heritage to protect, promote and develope these important features for the programme area and developing wider territorial synergies and links to the benefits of the programme area.

The NPA Programme has the potential to bring strong regional and territorial development perspectives to the EU Arctic Policy, as well as national Arctic policies, recognising the unique circumstances and challenges of the Northern Periphery and Arctic Programme area compared to other parts of Europe. In particular, common characteristics in relation to demography, indigenous perspectives, peripherality, insularity and harsh conditions .
The NPA programme has a leading role in the cooperation between the Arctic INTERREG programmes (a cooperation that potentially will be extended to national programmes and other Arctic networks). To bring the cooperation to a project level, the NPA can support projects that cooperate across programmes in order to encourage increased alignment, synergies and results.

The specific objective does not only target Arctic regions, but also other northern European regions that have similar features and challenges.

Types of actions to be funded:

- Development and transfer of capacity building concepts to engage stakeholders in cooperation based on local knowledge, supporting them to implement strategies for Northern Periphery and Arctic regions

In all activities that are approved by the NPA programme, there should be an integration of the horizontal criteria. This means that the activities should strive for a performance with a low carbon footprint, with equal opportunities for men and women and inclusion of underrepresented groups, including indigenous peoples and other culturally and linguistically distinct groups originating from the NPA area.

Source: NPA drafting team

2 ENVIRONMENTAL BASELINE AND TRENDS

The Northern Periphery and Arctic Programme covers a vast geography from the West Coast of Greenland to the Eastern borders of Finland, approximately 2,967,4451 km² and approximately 6.5 million people. The programme area covers diverse landscapes, ranging from mountainous regions and large boreal forests to long coastlines and islands. Harsh and extreme climatic conditions are a common feature, with many regions experiencing long cold winters. A large part of the Programme area lies north of the Arctic circle, but it also includes near-Arctic areas of Norway, Sweden, Finland, Iceland, Ireland and Faroe Islands. Amplified by extreme environments, climate and geography, extreme peripherality from major economic centres and sparse populations are defining characteristics framing the state of the environment of the region.

2.1 ENVIRONMENTAL CONDITIONS AND BASELINE

The NPA countries have unique and diverse landscapes, biospheres and eco-systems, incorporating ice sheets and glaciers, tundra, mountainous area, long coastlines, islands and extensive aqua-territories. **Economic development in the NPA area relies heavily on natural resources, due to the economic dominance of, for example, the fishing and forestry industries**. As such, the NPA area is highly exposed and sensitive to environmental challenges and change. At the same time, the area's reliance on natural resources and unique environments equips them with valuable expertise in the field of environmental management and protection.

The natural environment of the NPA territory faces a range of environmental challenges, such as land and marine pollution, (over)exploitation of natural resources, pressure from competing land uses, and the management of fragile natural environments and species. Specific environmental concerns are increasingly being considered against the backdrop of climate change. Climate change is a challenge that is shared across the NPA area and will impact upon and influence the current environmental concerns and pose new challenges.

The following discussion of the state of the NPA environment considers in particular the environmental issues relevant for the selected Programme priorities.

2.2 EXISTING ENVIRONMENTAL ISSUES

The NPA area is both particularly susceptible to the impact of environmental damage and climate change, especially in the Arctic regions, and an area with huge potential for green development and renewable energy resources.

2.2.1 Physical environment and biodiversity

The area has diverse, unique landscapes and terrestrial and aquatic ecosystems, ranging from the Arctic tundra of the north down to the temperate parts of the south, influenced by the Gulf Stream. It includes tundra in the far north, the mountainous central Scandinavian peninsula, the massive boreal forest belt of Siberian province, stretching across the peninsula and Finland, fjords and marshlands, moorlands, freshwater lakes and rivers and coastal maritime territories.

Terrestrial ecosystems. Due to the low population density in the area there remain large natural and semi-natural environments. With the exception of Greenland, where ~45% of the total land mass is protected, the share of territory designated as terrestrial protected areas is lower in the NPA countries than the EU average[2]. However, Finland, Greenland, Iceland, Norway and Sweden boast large-scale nature reserves, contrary to most other European countries where protected areas are relatively small in size. They, thus, provide a habitat for large mammals such as elk, reindeer, lynx, wolf, and others. The conservation status of habitats and species varies between NPA countries. Finland has a comparatively good status for most habitats and species, while the conservations status of both habitats and species in Sweden is in the European middle range and Ireland reports a good conservation status for the majority of the species listed in the Habitat Directive, but has a rather poor conservation status of habitats[3].

Protected areas are vital against the loss of biodiversity. There are a number of endemic animal and plant species in the programme area, some of which are also endangered such as the Arctic fox. Habitat loss, fragmentation and degradation are the most significant threats to species. Main pressures come from agricultural activities, mining, logging and wood harvesting, energy production, urbanization and tourism (EEA, 2020c). The vegetation in the programme area, particularly north of the Arctic Circle, is vulnerable as plants grow very slowly due to the short vegetation period. Nature restores only very slowly after human interventions, if at all.

Freshwater ecosystems. For freshwater habitats and species, major threats include water pollution caused by agricultural and forestry effluent. In many cases it is further exacerbated

2 https://www.eea.europa.eu/data-and-maps/indicators/nationally-designated-protected-areas-1/assessment and https://www.nordicstatistics.org/environment-and-energy/

3 No comparable figures available for the Non-EU countries Norway, Iceland, Faroe Islands and Greenland.

by natural systems modification, for example, as a result of water abstraction for different uses and physical modifications (e.g. dams/weirs, canalisation or drainage). Climate change is a rising pressure as well as invasive species.

Costal and marine ecosystems. Costal and marine environments are particularly under pressure. Large parts of the NPA population live in coastal area, leaving little space for nature. Marine ecosystems are under pressure from hazardous substances, pollution (including plastic pollution) and eutrophication (from agriculture and industry), shipping, unsustainable commercial fishing, marine litter and climate change, in particular, ocean acidification. The Baltic Sea is threatened by large algae growth as a result of high concentrations of nitrogen and phosphorus, mostly from agricultural runoffs. Along large parts of the Norwegian coast, invasive species like the Russian Kamchatka crab or king crab pose a serious threat to native species. Ireland's marine environment is one of the largest in the EU and is nearly 10 times its land area. The temperate waters that surround Ireland provide a sustaining foundation for a rich marine life, including hundreds of species of invertebrates and fish, whales and dolphins, breeding colonies of both the common and grey seal and some of the largest breeding populations of seabirds in Western Europe (Ireland Environmental Protection Agency, 2016). However, only 2.14% of Ireland's maritime area is designated for protection.

2.2.2 Natural Resources – extraction and use

Forestry, fisheries, metal ore and oil extraction. The programme area has abundant natural resources such as forests, fish, mineral ores, mineral oil and gas, but also renewable energy resources. Natural resources form an important basis for the economies of the area: Finland, Norway and Sweden have large forest resources, and timber, pulp and paper are important export products. Sweden and Finland have significant iron ore reserves. In Norway important industries are oil and gas extraction, forestry, fishing and hydropower. In Greenland, Iceland and the Faroe Islands, fishing (including aquaculture and the fish processing industry) is the single most important (export) industry. Other important natural resources that are exploited are: aluminium, hydropower and geothermal power in Iceland; renewable energies, and, in particular hydropower, in Greenland, where it is expected that the warming of the ground as a result of climate change will make exploitable large reserves of precious metals in the future. The Irish economy is least dependent on the exploitation of natural resources of the NPA countries, with the primary sector of the economy (including agriculture, forestry, mining and fishing) constituting only about 5% of Irish GDP, and 8% of Irish employment[4].

The NPA region faces a range of environmental challenges linked to the extraction and exploitation of natural resources, environmental protection, and climate change. A number of environmental impacts are associated with renewable energy generation, including land, habitat and wildlife loss, the increased demand for mining of minerals, etc. Productive forests are often biodiversity-poor monocultures and particularly susceptible to climate change.

[4] See https://en.wikipedia.org/wiki/Natural_resources_of_the_Republic_of_Ireland.

Although there are signs of recovery of monitored fish and shellfish species in the North-East Atlantic Ocean and Baltic Sea, many species are still overfished (EEA, 2020d) and destructive fishing methods endanger other species not fished commercially. The environmental load from the aquaculture industry is high, especially linked to farmed salmon: escapes threaten wild species, waste feed and fish faeces spread diseases, chemical agents are released, the spawning behaviour of other wild species impacted, etc. (Norges Miljøvernforbund, 2011). The region's mining tradition and the opening of new mining megaprojects highlight the ongoing and evolving challenge of how to balance sustainable economic development, environmental management and the needs of local communities.

(Nature) tourism. As regards (nature) tourism, which is another important economic sector intrinsically linked to the NPA natural environment, there are tensions between economic interests and environmental protection. The Nordic region of the NPA witnessed steep growth in tourism across many rural areas from around 2010 until the Covid19 pandemic in early 2020 (Bogason, *et al.*, 2021). Also in Ireland, tourism is one of the most important economic sectors and, in particular, geological tourism is tightly linked to the country's natural areas. This development has led to concerns about negative environmental impacts of tourism and overcrowding in certain hotspots, especially in connection with the traditional 'right to roam' in the Nordic countries, that is, the public right of free access to nature and often pristine areas. Even protected natural sites of high amenity value come under pressure when large numbers of tourists exceed the carrying capacity of a site. Cruise tourism is another area of contention due to the massive growth it experienced in the past decades. Concerns relate to the fact that tourists are highly concentrated in time and space. Cruise ships require large physical infrastructures and may bring unsustainably large crowds of tourists to, until then, remote locations.

Ecological footprint. The wasteful use of resources is linked to many of today's greatest environmental problems, including climate change and pressure on biodiversity. The total ecological footprint of the EU-27 Member States plus the United Kingdom, i.e. its demand for ecological goods and services, exceeds by a factor two their biocapacity, which is the capacity of ecosystems to produce useful biological materials and to act as sinks of carbon emissions. This leads, on the one hand, to over-exploitation of domestic stocks of ecological capital and, on the other hand, to the import of products leading to exploitation of the biocapacity in other parts of the world (EEA, 2020a). However, Norway, Sweden and Finland[5] are among the few countries in Europe where the footprint is smaller than the national biocapacity. Also Ireland has a relatively small biocapacity deficit compared to most other European countries.

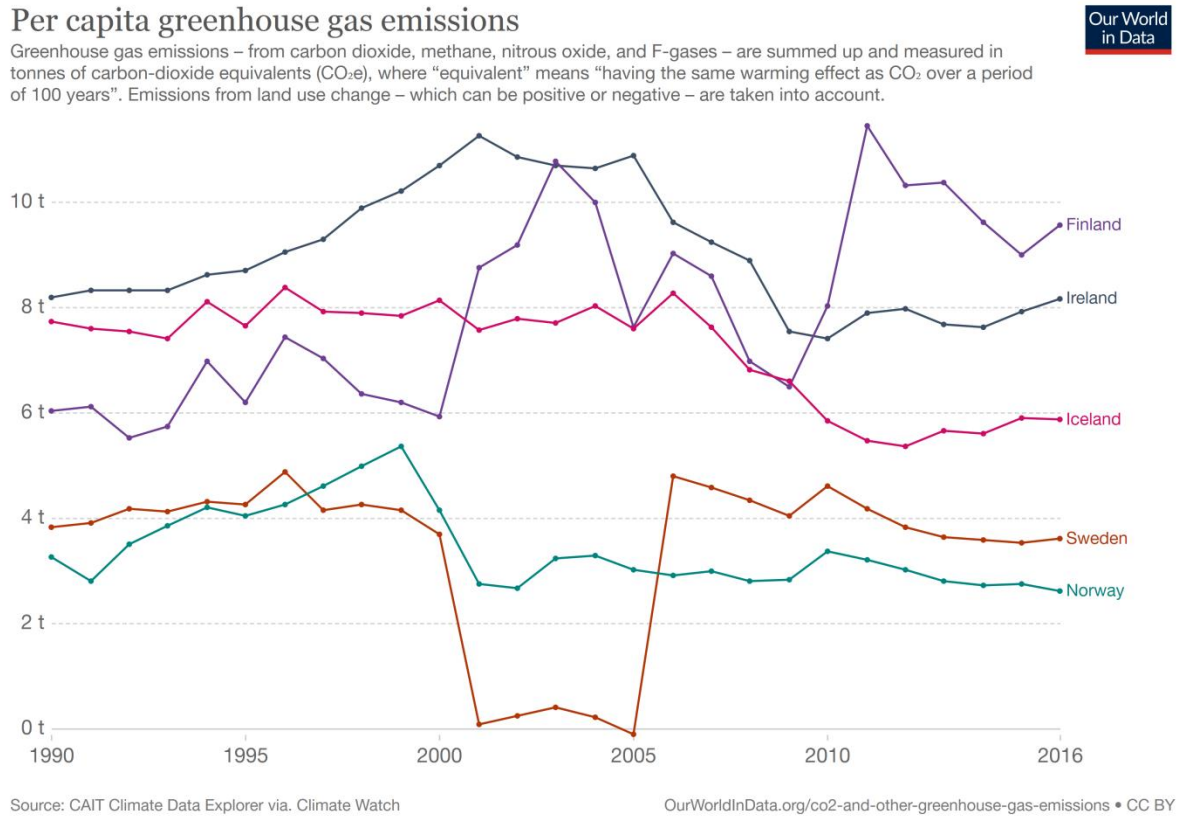
To curb the unsustainable patterns of consumption, NPA countries are working towards improving the circularity of the national economies to reduce the generation of waste, use of energy and need to extract new materials. According to Eurostat[6], a circular economy is one

[5] No data available for Greenland, Faroe Islands and Iceland.
[6] See https://ec.europa.eu/eurostat/web/circular-economy.

that maintains the value of products, materials and resources for as long as possible by returning them into the product cycle at the end of their use. The circular material use rate in the EU MS Finland (6.2%), Ireland (1.6%) and Sweden (7%) is below the EU-27 average of 11.9% in 2019[7]. Recycling rates in the NPA countries are close to the European average for most waste types and, with the exception of Sweden, municipal waste generated per capita is above the EU average of 502 kg/capita in 2019.[8]

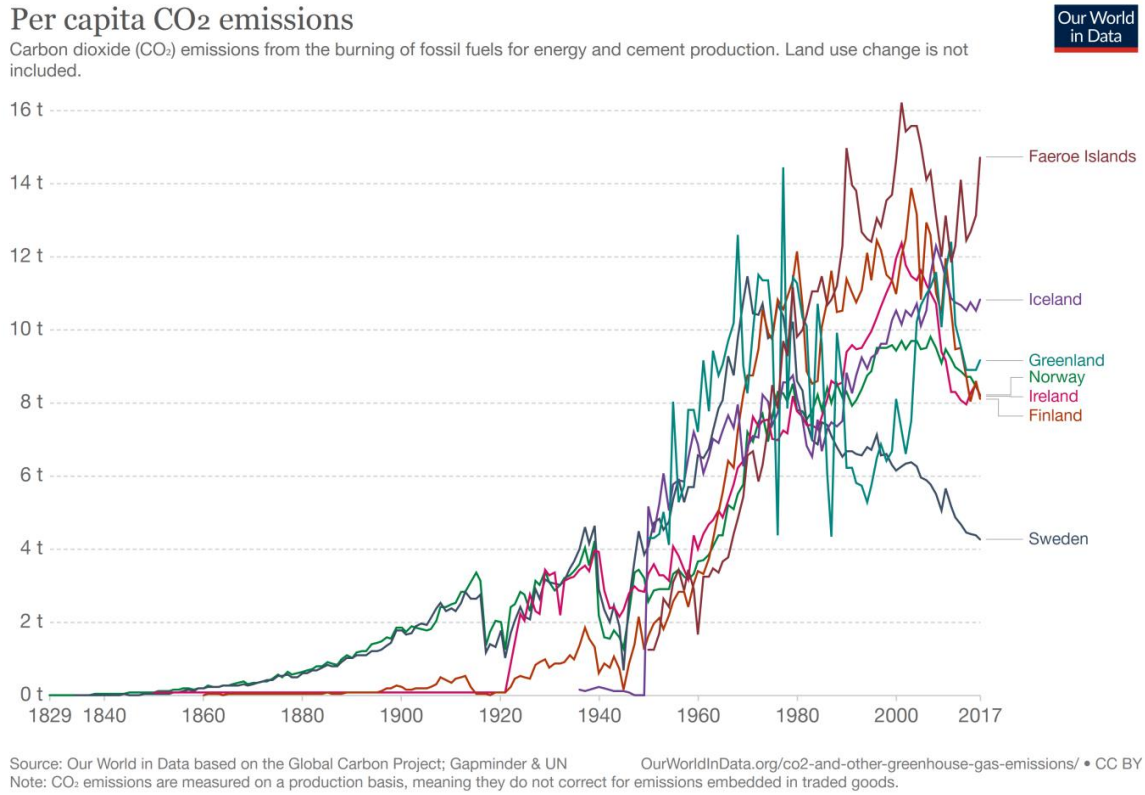
Greenhouse gas footprint. The per capita greenhouse gas of the NPA countries is above the global average of 4.8 tons per capita in 2017 in all countries but Sweden. However, it also varies greatly between the countries due to differences in economic structure, share of (domestic) renewable energy generation, and consumption patterns (see Figure 2) (Ritchie & Roser, 2017). The picture changes, when looking only at carbon dioxide emissions (see Figure 3). Decreasing energy use (e.g. through low-carbon technology), remains an important measure to reduce the NPA countries' carbon footprint.

Figure 2: Per capita greenhouse gas emissions in the NPA countries



[7] See https://ec.europa.eu/eurostat/databrowser/bookmark/b223503c-e6d5-4a82-bb41-1bbf336d24d3?lang=en. No data available for Greenland, Faroe Islands and Iceland.
[8] See https://ec.europa.eu/eurostat/statistics-explained/index.php/Municipal_waste_statistics. No data for Greenland and Faroe Islands.

Figure 3: Per capita CO_2 emissions in the NPA countries



Renewable energy generation. The NPA region already has substantial renewable energy generation and expertise in the sector, e.g. hydropower in Norway and Sweden, biomass in Finland, geothermal in Iceland, and the increased use of wind energy in Ireland. About two thirds of the electricity consumption in the Nordic region derives from renewable energy sources, with the figure in Iceland and Norway close to 100 percent (Sovacool, 2017). As a result, electricity's carbon intensity is below 60 CO_2/kWh compared to a global average of around 500. Even though solar photovoltaic energy is currently not widely used in the Arctic, high latitude regions can receive significant amounts of sunlight and this particular source has strong future growth potential.

In remote and peripheral NPA territories, the deployment of 'niche' alternative energy source is already well advanced. For example, decarbonising island energy systems, which have traditionally relied on diesel generators or imported energy, is an area of ongoing work. The Faroe Islands are working to use local energy resources in a smart and zero-emission energy system using wind, hydro, solar, tidal, pumped storage, and batteries. Greenland aims to achieve 100 percent renewable heat and power supply for its 55,000 residents by 2024, primarily by tapping its significant hydropower potential.

Other niche generation sources include biomass, micro-scale wind turbines, combined heat and power systems or micro and small hydroelectric power stations. Many are well suited to community-level or individual use. Peripheral Northern and Arctic communities not connected to regional electricity grids rely upon distributed generation, in particular from renewable

sources (i.e. the production of electricity from numerous microgeneration sources). Community-based energy generation also contributes to regional economic development and has associated social benefits, such as strengthening local engagement and social capital.

2.2.3 *Climate change*

Climate change is already having a devastating impact on the NPA area. The impacts of climate change are diverse and wide-ranging, including loss of biodiversity, increased river levels due to higher rates of rainfall, smaller and less glaciated areas, fewer areas with permafrost, and more extreme weather events threatening coastal communities. Climate change affects the whole territory, but regions within the area also face specific challenges. For example, the Arctic NPA area is particularly sensitive to climate change because of ice-albedo feedback and the vulnerability of its ecosystem - temperatures have increased at almost twice the global average rate over the past century.

Combating climate change and climate change adaptation/resilience are major challenges for the area. Climate change is already a common focus in bilateral and multilateral programmes and networks across the area (e.g. Working Groups in the Arctic Council) and each NPA country has set ambitious goals toward cutting carbon emissions. This commitment has driven innovation, capacity, and leadership in 'Green technologies and solutions' and with respect to carbon neutrality and environmental aspects. Achieving these goals will rely heavily on innovation in the industrial, transport and building sectors, as well as efforts towards behaviour change, particularly with respect to consumption patterns. For example, actions to support remote working, more energy efficient buildings, developing eco-products, Cleantech, boosting the circular economy, addressing efficiencies in supply chains, recycling and waste reduction (especially food waste) will all have a role.

For some areas, particularly in the Arctic, a major challenge will be to safeguard the environment against the impacts of transport and primary resource extraction. The reduction in summer ice cover will open up new Arctic shipping routes, but increased maritime traffic will place greater environmental pressure on marine and coastal environments (for example, through black carbon diesel engine emissions). Onshore and offshore primary resource extraction (hydrocarbons and mining) is also expected to intensify. Climate change is a major factor in considering the development of infrastructure in northern sparsely-populated areas. Infrastructure will need to be adapted to the effects of warming climate on sea ice, more frequent storms, and coastal erosion. In Ireland, these impacts are already experienced through flooding, more extreme weather and rising sea levels, (Government of Ireland,2020). Furthermore, there is a need for climate change adaptation to be mainstreamed into all policy areas in an integrated way.

2.3 ENVIRONMENTAL SWOT

Table 1. Environmental SWOT

STRENGTHS	WEAKNESSES
• Unique and diverse landscapes, biospheres and eco-systems • Unspoilt, pristine nature • Large natural and semi-natural environments due to low population density • Large-scale protected areas providing habitat for large mammals • Unique endemic species • Capacity and expertise in environmental management and protection • Innovative and leading action in relation to climate change	• Reliance on exploitation of natural resources(e.g. fishing and forestry industries) • Habitat loss, fragmentation and environmental degradation are significant threats to species • High per capita greenhouse gas emissions • Pressure of tourism in sensitive environments • Pressure and pollution in marine and freshwater ecosystems • Percentage of marine protected areas
OPPORTUNITIES	**THREATS**
• Great potential for sustainable green development and renewable energy resources • Abundant environmental and natural resources such as forests, fish, metals, minerals, oil and renewable energy resources • Innovation, capacity and leadership in relation to climate change • Pursuit of territorially sensitive niche solutions to address needs in the high North, e.g. innovative renewable energy solutions • Working towards improving the circularity of the national economies to reduce the generation of waste • Environmentally sensitive and managed tourism • Use of	• Vulnerability/exposure to climate change threats • Loss of biodiversity due to climate change and changing agricultural/forestry methods • Reliance/risk of overuse of some natural resources • Not always good conservations status of both habitats and species • Land and marine pollution • (Over)exploitation of natural resources due to pressure from industrial development and the opening of new mining megaprojects • Impacts of climate change are diverse and wide-ranging, including loss of biodiversity, increased river levels due to higher rates of rainfall, smaller and less glaciated areas, fewer areas with permafrost, and more extreme weather events threatening coastal communities

3 POLICY CONTEXT

The environmental policy framework in the NPA programme region is diverse, given that the programme area currently covers territories in seven countries. This section identifies key strategies, programmes and policies that characterise and define the operational context for the Northern Periphery and Arctic Programme. The identification of the relevant aspects of these environmental initiatives also highlights the scope for environmental impact afforded to the NPA programme. For more detail on territorial strategies mentioned, refer to Annex 2.

3.1 INTERNATIONAL

Relevant initiatives at a global level have influenced the focus and direction of environmental programmes on the national and regional stage. The UN Sustainable Development Goals (SDGs) are a paradigmatic example. They encompass seventeen interdependent areas for societal development, such as clean water and sanitation (7), affordable and clean energy (8) and climate action (13). These were designed as actionable goals, with specific targets and progress indicators identified for each one. They thus provide a global standard and coherence for integrated sustainable development initiatives at multiple levels.

At an international level, the Paris Agreement also frames environmental actions. It is a legally binding international treaty on climate change adopted by 196 Parties at the 21st yearly session of the Conference of the Parties (COP21) in 2015, and entered into force in November 2016. Its major goal is to limit global warming and achieve a climate neutral world by 2050, creating an accountability and transparency structure in which signing countries communicate their climate and emissions-related actions. This has generated further interest and adoption at national, regional and urban levels of carbon neutrality targets and zero-carbon solutions.

3.2 EU

Out of the currently seven countries of the NPA programme area, three are EU Member States. EU environmental policy thus underpins the policy framework of the programme. The most relevant EU strategies in this context are the European Green Deal and the Eighth EU Environmental Action Programme.

3.2.1 European Green Deal

The European Green Deal is an agenda adopted by the European Commission on December 11th 2019. It announced the adoption of a new environmental action programme, with the overarching aim for the EU to become the first climate neutral continent by 2050, while responding to several environmental challenges such as climate change, conservation and enhancement of EU's natural capital, and protection of citizens' wellbeing.

The agenda is oriented toward the decoupling of economic growth from resource use, and leading a just and inclusive sustainable transition that leaves "no person and no place" behind.[9] Actions proposed include investing in environmentally-friendly technologies, supporting innovation, decarbonising the energy sector and collaborating on more sustainable infrastructure, approaches and environmental standards.

Specific policy areas of action have also been suggested through this agenda: biodiversity, Farm to Fork, sustainable agriculture, clean energy, sustainable industry, building and renovating, sustainable mobility, eliminating pollution and climate action. The programme has also been associated with the recovery for the COVID-19 pandemic, as investment opportunities in this context often target foundational elements of society that could be reoriented toward more sustainable solutions.

3.2.2 *Eighth EU Environmental Action Programme*

Recently, the European Council has been approved to start negotiations with the Parliament for an agreement on the 8th Environmental Action Programme. This proposed programme builds upon the priority objectives of the European Green Deal, seeking to support EU's common commitment toward a green recovery, especially in the context and aftermath of the coronavirus pandemic. It does not include a list of actions, which are expected to be added in the future.

This proposal follows the long-term objective of "living well, within the planetary boundaries", as established in the 7th programme. Reflecting recent policy developments, the 8th programme is very oriented towards decarbonisation and a just transition, focusing on the following six core thematic objectives: greenhouse gas emissions reductions, adaptation to climate change, a growth model that gives back to the planet more than it takes, a zero-pollution ambition, protecting and restoring biodiversity and reducing key environmental and climate pressures related to production and consumption. The mobilisation of broad support by involving citizens, social partners and other stakeholders and encouraging cooperation in the development and implementation of strategies at various administrative levels has been considered in the proposal as a key requirement for the attainment of these objectives.

Several specifications to the new monitoring framework of the 8th programme have also been proposed by Member States, most notably a requirement for the European Commission to yearly evaluate progress achieved and to present a list of actions for the implementation of priority objectives.[10]

[9] For more information, see https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en.

[10] For more information, see https://www.consilium.europa.eu/en/press/press-releases/2021/03/17/8th-environment-action-programme-member-states-ready-to-start-negotiations-with-parliament/.

3.3 TERRITORIAL COOPERATION

Given that environmental challenges are not limited by regional or national borders, territorial cooperation is necessary to ensure they are tackled effectively. This sub-section expands on regional, national and cross-national territorial strategies that define broader priorities and thus impact on development and environmental objectives and areas of action.

3.3.1 Regional and national strategies

Strategies falling within this category were identified in Ireland, Iceland, Greenland and Finland, and pertain to, e.g., planning frameworks, urban and regional development policies and sustainability and economic growth plans. The frameworks, policies and plans proposed aim at managing the territory, population variation, the economy and industrial structure (Ireland, Iceland, Finland and Greenland), climate change (Iceland and Finland), tax system and public finances, housing, education (Greenland and Finland) and sustainable communities (Finland). Given the common themes across the different countries, there is not only multi-level capacity within these national settings, but also coherence across the NPA programme area on these topics and thus potential for international cooperation.

3.3.2 In the Arctic

Arctic territorial cooperation is a key aspect of the NPA programme, and also useful in analysing potential synergies in environmental programmes across partner countries and the broader Euro-Arctic zone. Strategies pertaining to the Arctic territory are therefore mentioned in this sub-section.

i. EU

In 2016, the EU published an Integrated EU Policy for the Arctic. This joint communication focuses on three priority areas for cooperation, particularly across the European part of the Arctic: a) climate change and safeguarding the Arctic Environment; b) sustainable development in and around the Arctic; c) international cooperation on Arctic issues. Additionally, it emphasises the importance of research, science and innovation as a transversal priority across all these areas.

ii. NPA countries

Given their participation in the NPA programme, the NPA countries have defined their Arctic strategies and priorities for collaboration and development in this area. These Arctic plans have defined priorities that are in great part similar and complementary. Priority areas such as those of international cooperation, security, peace and stability, and ensuring good living conditions and wellbeing are present in both **Sweden** and **Norway**'s Arctic strategies. Sweden's 2020 Arctic Strategy specifically sets out priorities related to climate and the environment, polar research and environmental monitoring, sustainable economic

development and business interest. Norway's 2017 Arctic Strategy and its 2020 White Paper on the High North also define further objectives regarding integrated ecosystem-based management, employment, value creation and welfare, and closer cooperation between knowledge institutions and business.

Finland's 2017 Arctic Action Plan focuses on Arctic Foreign and EU policy, commercialisation of Arctic expertise, sustainable tourism and infrastructure. In particular, the report denotes an Arctic collaboration mind-set. For example, in its study on Arctic mining in Greenland, Finland also evaluated the opportunities for mineral exploration in this area that is expected to become more accessible with the effects of climate change and global warming.

Iceland's 2011 Arctic Strategy follows a similar rationale to this latter point. While it provides an overarching policy on Arctic environmental issues, navigation and social development, the twelve principles it defines focus primarily on strengthening relations and cooperation and Iceland's Arctic identity. They include, for example: promoting and solidifying the Arctic Council, advancing Icelanders' knowledge of Arctic issues, increasing cooperation at the domestic level on Arctic issues, and safeguarding security interests in the Arctic region through civilian means.

For **Greenland,** Arctic development concerns are central to overall development planning. Currently a new joint Arctic Strategy (Denmark, Faroe Islands and Greenland) is being developed and is expected to focus on people, business development, research, natural resources, environmental preparedness, and maritime rescue. In 2013, the **Faroe Island**s published 'The Faroe Islands: a nation in the Arctic', which outlines Faroese interests in relation to the joint Arctic Strategy (especially in terms of international cooperation, business, environment and research in the Arctic context).

Of the NPA countries, only Ireland does not have an Arctic strategy. **Ireland** has, however, been actively advocating for a closer dialogue with the Arctic and the wider northern periphery (e.g. the Irish Cabinet of Ministers took a decision on 2 December 2020 to submit an application as an Observer to the Arctic Council) and has a specific interest in the impact of climate change on coastal and agricultural areas.

iii. Other territories

Outside of the NPA programme area, other countries in the Euro-Arctic zone have advanced strategies for the Arctic. In 2019, **Canada** developed an Arctic and Northern Policy Framework, which seeks to promote and create thriving, strong and safe societies for Northern and Arctic people.[11] In it, the federal government and its partners set out key priorities and actions related to, for example, healthy and safe communities, energy, transportation and communications

[11] For more information, see https://www.rcaanc-cirnac.gc.ca/eng/1560523306861/1560523330587.

infrastructure, climate change and labour market. Furthermore, it also seeks to advance reconciliation and improve relationships between indigenous and non-indigenous peoples.

Russia has also prioritised territorial cooperation and a strategic focus in the Arctic. In 2013, Russia updated its Arctic strategic, which although possessing an international dimension, covers only the Russian Arctic Zone (RAZ). More recently, the country set out ten Basic Principles of the Russian Federation State Policy in the Arctic. These include, among others, territorial cooperation through (especially) the Arctic Council, intensifying research and development of the Arctic shelf, stimulating economic development and infrastructure in the Arctic (e.g. labour market, mineral resource centres, logistic routes), improving the quality of life in the Arctic zone and supporting indigenous peoples.

The **UK** has prioritised three overarching areas in the Arctic: protecting global influence, protecting people and the environment and promoting sustainable and responsible economic and commercial development in the Arctic. In particular, the Scottish government has developed an Arctic policy mapping report, which details existing links with the Arctic region, recommends advances on technical innovation, Arctic research, and education models and links, and demonstrates a need to seek out and develop opportunities related to energy sources (e.g. oil, gas, renewable energy) and other relevant industries (e.g. fisheries, tourism). Furthermore, this report seeks to push an Arctic identity for Scotland, promoting sub-national collaboration in the Arctic and protecting the needs of communities.

3.4 NPA COUNTRIES AND REGIONS

3.4.1 *Energy and climate change*

The majority of environmental initiatives led by NPA countries and regions focused on the themes of energy and climate change. Given the pressing challenges associated with climate change, and how international policy frameworks inform the approach to this topic, several environmental strategies and policies were developed in NPA countries to address the issue.

Most NPA countries have set greenhouse gas (GHG) emissions reduction targets for the coming decades. Finland aims to be carbon neutral by 2035, as well as to become the first fossil fuel-free welfare society by utilising cost-effective renewable energy. Iceland hopes to reduce net emissions by 50-75% by 2050, namely by reducing its use of fossil fuels, and addressing emissions linked to industrial processes. Ireland has set a goal of 30% GHG emission reduction by 2030 through a delivery of energy of at least 70% renewable sources, and by increasing public investment in climate action (e.g. €500m in Climate Action Fund). Norway foresees its GHG reductions to be between 40-50% by 2030, helped by the utilisation of EU flexibility mechanisms. Additionally, Norway aims to be climate neutral by 2030 and a low-emission society by 2050.

Several present and potential challenges related to climate change and the energy transition are identified in these country strategies. These include: consumption and production patterns (Finland), pressure on biodiversity and natural environment, namely from climate change and economic and leisure activities (Finland, Iceland, Norway), soil erosion and extreme floods (Iceland, Ireland), ocean acidification (Iceland), increased pollution and waste (Norway). Different approaches, priorities, actions and potential solutions were highlighted:

Governance and financial arrangements

- Supporting internal energy market (Finland) and supply chains (Ireland, Norway);
- Digitalisation and sustainability of public service systems (Finland, Ireland);
- Integration of environmental sustainability into policy (Finland, Ireland);
- Reduction in emissions trading (Finland);
- Emission reduction in heating of buildings (Finland);
- Increasing carbon sequestration (Iceland), namely through afforestation and land reclamation;
- New governance arrangements (e.g. climate action delivery board) (Ireland);
- Sectoral climate adaptation plans (e.g. health, agriculture) (Ireland);
- Creation and promotion of green support schemes (Norway);
- Management of natural resources' sustainability (Norway, Sweden, Ireland).

Research and innovation

- Fund to support low-carbon tech (Iceland);
- Electric vehicles (Ireland);
- Ocean research (Ireland, Norway);
- Energy sector (Ireland, Norway);
- Sustainable land-use (Norway, Iceland);
- Governance and management (Norway);
- Climate change (Norway).

Infrastructure

- Update and adaptation of water quality, transport and services infrastructure (Ireland);
- Climate change considered in planning and design standards (Ireland);
- Securing energy mix;

- Improvement of air quality and water management (Norway, Finland, Sweden);
- Increase carbon sequestration and storage capacity (Iceland, Ireland, Norway);
- ICT Infrastructure and applications (e.g. smart cities, robotics, blockchain, broadband) (Finland, Ireland);
- Phasing out fossil-fuel in transport, landfilling organic waste and climate-warming chemicals (Iceland);
- Increased recycling and reducing waste production (Iceland);
- Investing in renewable energy, namely offshore (Ireland) and hydrogen (Norway) ;
- Green shipping (Norway).

Overarching methodologies and priorities

- Multistakeholder cooperation (Finland, Ireland);
- Decarbonisation (e.g. in energy generation and transport) and energy efficiency (Finland, Ireland);
- Combatting energy poverty and empowering of citizens and community projects (Ireland);
- Promotion of entrepreneurship (Ireland);
- Climate change adaptation and mitigation (Finland, Ireland, Norway);
- Restoration and enhancement of biodiversity and management of ecosystems (Norway, Finland, Ireland);
- Cost-benefit analyses (Norway);
- Public education campaigns (Iceland);
- Sustainable tourism (Iceland);
- Export of renewables and green solutions (Norway, Ireland).

3.4.2 Circular economy

The concept of the circular economy is in its early stages of dissemination and implementation, but it is gaining traction in NPA countries, with strategies being developed namely in Finland, Ireland and Sweden. The latter's recent 2020 Circular Economy Strategy for the Transition envisions an efficient use of resources in non-toxic circular flows, and is closely based on the SDGs and the 2030 Agenda. Ireland's circular economy objectives are not only focused on improving flows and supporting more robust sustainable economic models and institutional arrangements for the waste sector, but also seek to increase accountability for producer in product disposal and in ensuring the longevity of products.

Finland demonstrates an ambitious goal in transitioning to a carbon neutral circular economy by 2025. Its strategic goals reframe the discourse on this concept by focusing on mind-set changes, namely by regarding natural resources as scarcities, rethinking the concepts of competitiveness and vitality, and focusing on every day decisions to ensure the transition. Its Roadmap for the Circular Economy 2.0 also provides examples of actions, such as the creation of a Bio and Circular Finland programme to finance internationally competitive circular economy solutions, developing circular economy criteria and creating tools to help companies make the transition for sustainable circular production and economic models.

3.4.3 Resources & environment

Regarding resources and the natural environment, the majority of the NPA countries focuses on water courses and areas, namely marine and coastal resources and environmental protection. This is mainly because these countries have large coastal areas and developed part of their economies on marine and offshore resources, such as fishing, aquaculture, shipping and oil. Concomitantly, climate change is expected to greatly affect the ocean

currents, temperatures and sea levels. Along with other related challenges such as ocean acidification, risk of acute pollution, overfishing and the eventual decline of biodiversity, this has led to this theme becoming a key priority for the NPA area.

Priority areas for the NPA countries and regions related to the marine and coastal environment and resources include promoting competitive green shipping and fishing industries (Norway, Finland, Sweden), namely by introducing fishing and biofuel quotas and cutting eutrophication in waters; preventing the introduction of invasive species and strengthening marine protected areas (Finland); reducing and curtailing pollution (Finland); preventing hydrographic changes (Finland) and protecting the coast (Ireland, Sweden); balancing the marine environment (Sweden) and implementing efficient sea and water management (Norway, Finland), and creating natural and local value (Norway). Additionally, emphasis is placed on research and development, governance measures and digital applications for better mapping and management of these areas.

4 ENVIRONMENTAL ASSESSMENT

Strategic environmental assessment requires assessing actions that have not yet been defined in terms of concrete projects, and for which the location of implementation is not known. Consequently, the assessment focuses on providing an indication of the range of potential impacts and highlight ways in which positive impacts can be generated and negative impacts minimised.

At this stage in programme development, the priorities, objectives and actions that will be supported have been chosen, but the programme budget is not yet known. The assessment is based on the most updated content of the draft 2021-2027 Northern Periphery and Arctic Programme (May 2021). Moreover, the following sources of information have been considered:

- Environmental performance of the current INTERREG VB Northern Periphery and Arctic Programme (Programme Impact Evaluation);
- Desk research on existing environmental issues in the programme area, existing environmental strategies, programmes and policies as guiding instruments; and
- Consultations with Environmental Authorities.

4.1 ENVIRONMENTAL IMPACTS OF NPA PROGRAMME

Sustainability is a principle that can be traced throughout the entire draft Programme. The Programme strives to sustain livelihoods in the remote, sparsely populated communities of the Programme territory while at the same time having a positive environmental impact. It is also sensitive to the special needs of the indigenous people in the Programme area and requires that the horizontal principles 'low carbon footprint, with equal opportunities for men and women and inclusion of underrepresented groups' are integrated in all funded activities.

Past Programme impact evaluations have found an overall positive impact on the environment. A strong aspect of this has been the work around environmental protection and sustainable development adapted to the specific environmental needs and demands of remote and peripheral areas. For example, positive effects have been achieved by (McMaster et al., 2018; Wergles, 2014):

- Changing business practices to reduce the environmental impact of traditional economic activities such as aquaculture farming, forestry, mining, etc.;
- Reducing travel-related carbon emissions through the provision of e-services;
- Promoting the generation of energy from locally sourced renewables and smart energy management;
- Increasing capacities in local authorities for environmental management; and
- Innovation in new sustainable products and transfer of green technologies, etc.

Since the 2021-2027 Programme stands in the tradition of its predecessors as regards the selection of priorities and objectives, it can be reasonably assumed that the future Programme will also contribute positively to the environment. The Programme continues to focus on making soft interventions (e.g. building capacity, influencing policy, creating links and networks, etc.) rather than hard investments, which is also a necessity arising from the fact that the Programme budget is moderate. Nonetheless, there may be potential conflicts of interest in the Programme between the goals of growth, competitiveness and employment and environmental protection. The actual environmental impact will therefore depend on how well the Programme strive for the balance between these sometime conflicting objectives.

Consultations with Environmental Authorities showed that they expect an overall neutral or positive environmental impact of the Programme. The actual impact, however, will depend very much on how effective the Programme will be in securing positive outcomes and how attentive it will be to avoid potential unintended (negative) side-effects (see section 4.2).

Policy review shows that Programme priorities also fit well with international, EU and national environmental strategies. The NPA area faces a wide range of global environmental pressures and challenges and NPA countries are signatories to a large number of international environmental conventions. The Programme is also conditioned by the European Union Cohesion policy regulations and domestic policy priorities and agendas. Interreg programmes are expected to focus on a selected number of EU policy objectives in pursuit of implementing EU policies, e.g. on sustainable energy, circular economy or sustainable economic growth. Thus, the NPA operates within and has ensured alignment with a complex web of international, national and regional environmental policy.

4.2 ENVIRONMENTAL APPRAISAL OF PROGRAMME ELEMENTS

All three proposed Programme priorities touch upon issues or involve sectors relevant for a Strategic Environmental Assessment. The expected overall environmental impact of the Programme ranges from neutral to positive.

4.2.1 Priority 1: Strengthening the innovation capacity for resilient and attractive NPA communities

Specific Objective 1.1 - Developing and enhancing research and innovation capacities and the uptake of advanced technologies

This specific objective (SO) aims to develop and enhance research and innovation capacities and the uptake of advanced technologies in SMEs and microenterprises, pursuing higher value-added processes activities can be diversified and expanded.

As outlined in the draft programme, the SO promotes innovation capacities to tackle environmental issues such as climate change, for example green and blue technologies. Examples of sectors eligible for funding mentioned include healthcare, energy, the marine

economy, circular economy, transport, environmental and natural resources as well as innovation with emphasis on tourism, culture, and creative industries.

Impact: *The expected impact on the environment is limited and, potentially, positive if innovation addresses environmental problems. Existing environmental issues which are most likely to be negatively impacted are biodiversity and climate change.*

Recommendation: *In the case of the development of new products, the application of ecosystem services and life cycle analysis can ensure their positive ecological footprint. A particular concern is the sustainability of funding going to the tourism sector. Strategies, for example, visitor management, the promotion of areas that are outside existing touristic hotspots, the monitoring of sensitive habitats and species in touristic hotspots, etc., ought to be applied to reduce the potential negative impact of overcrowding. The impact of international tourism on climate change, in connection with aviation and long travel distances to the touristic location, ought to be viewed critically.*

Specific Objective 1.2 - Reaping the benefits of digitisation for citizens, companies, research organisations and public authorities

This specific objective aims to create better conditions for people to live and work in the NPA, including citizens, companies, research organisations and public authorities, through the transfer and development of digital solutions.

As outlined in the draft programme, the SO addresses the challenges experienced in the programme area that are linked to long distances and difficult access to markets and key services. Examples of solutions are remote healthcare or smart mobility, etc.

Impact: *The expected impact on the environment is positive. Providing services online helps reduce travelling, which saves energy and carbon emissions. Internet connectivity is good or very good in the NPA territory, which makes e-solutions a viable alternative. Existing environmental issues which are most likely positively impacted are climate change.*

Recommendation: *Increased e-commerce may result in a net increase in transport-related emissions. The NPA could request projects to pay attention to potential negative side-effects/ rebound effects of the funded interventions.*

Specific Objective 1.3 - Enhancing sustainable growth and competitiveness of SMEs and job creation in SMEs, including by productive investments

This specific objective aims to enhance sustainable growth and competitiveness of SMEs and job creation in SMEs, including by productive investments. This will be achieved by facilitating the transfer and development of business support strategies and solutions to overcome the particular challenges faced by start-ups and existing SMEs in remote and peripheral regions. An example is building networks and clusters with capacity to tackle the challenge of long distance to market for SMEs.

As outlined in the draft programme, the SO in particular addresses the non-traditional sectors with the aim to contribute to a more diversified and, hence, resilient economic base, but also to diversify and expand traditional sectors (e.g. forestry, fishing, mining, etc.) through innovation. According to the draft programme, a key sector for the area that employs a particularly high number of SMEs and micro enterprises is tourism. This is also a sector where it is important to engage indigenous groups and local communities in planning and activities. Beyond this, it is important to encourage traditional knowledge from the indigenous communities for the enhancement of farming and forestry, for example.

Impact: *The expected impact on the environment is limited. The objective primarily aims at soft interventions such as the building of networks or the transfer of knowledge, which are unlikely to entail negative environmental impacts. However, they may result in downstream environmental issues if they lead to enhanced business activities in environmentally sensitive sectors such as mining (long-lasting impact on the landscape and natural environment, water, soil and reindeer herding and Sami traditional activities), energy (impact on landscape and natural environment due to the construction of the generation and transmission infrastructure), fisheries (impact on biodiversity and water), etc. Existing environmental issues which are most likely to be impacted are depending on the sectors receiving funding.*

Recommendation: *Innovation in environmentally-sensitive sectors ought to focus on enhancing the sustainability of the existing economic activities. As mentioned under SO 1.1, to ensure the sustainability of tourism, a proper visitors' management is vital. Attention ought to be paid to ensuring that economic interests do not trump environmental interests. In particular on the local level there may be insufficient expertise to assess the environmental risks of new business development. A critical assessment of proposals regarding potential downstream effects is recommended.*

4.2.1 Priority 2: Strengthening the capacity for climate change adaptation, and resource sufficiency in NPA communities

Specific Objective 2.1 - Promoting energy efficiency and reducing greenhouse gas emissions

This specific objective aims to promote energy efficiency as a response to both global climate change and the region's high energy needs linked to the cold climate.

According to the draft Programme, the SO includes smart energy management and storage solutions, including decentralised systems, the use of energy surplus, but also the generation of energy from renewable resources.

Impact: *The expected impact on the environment is positive. This will be particularly true if the Programme manages to achieve net energy savings, that is, ensures that increase in energy efficiency are not forfeited due to an increase in total energy use ('rebound effect'). Parts of the NPA territory have abundant renewable natural resources (e.g. running water for hydropower, geothermal steam, strong winds, etc.) and produce relatively cheap energy. The incentive to save energy has been low in the past. However, increased overall energy demand requires the additional deployment of renewable energies, which has to be critically assessed as all existing renewable technologies involve adverse environmental effects. This is, for example, because of the destruction of ecosystems for the construction of additional infrastructures for generation and transmission, the need to mine rare earth metal, short rotation plantations replacing other land uses, construction of windmill parks, heavy forestry, etc. In particular wind power is viewed critically for its environmental impacts (and impacts on scenic attractions) in several of the NPA countries. Even though the exploitation of renewable energy resources is explicitly included in the description of the specific objective, the NPA is unlikely to contribute to large-scale renewable energy generation. Existing environmental issues which are most likely to be positively impacted are climate change. A negative effect on biodiversity (domestic and abroad) through the destruction and pollution of habitats could happen as a result of additional renewables deployment.*

Recommendation: *Priority should be given to projects that expect to achieve net energy savings rather than focus on additional renewable energies deployment and attention to potential rebound effects should be paid when assessing projects. A requirement for the development of new renewable energy projects to be realised in accordance with an environmental management system could be introduced by the NPA Programme. However, such a measure should be proportionate to the volume of the planned investment that the intervention may lead to.*

Specific Objective 2.2 - Promoting climate change adaptation and disaster risk prevention, resilience, taking into account eco-system based approaches

This specific objective aims to improve climate change adaptation, risk prevention and disaster resilience through the transfer and development of solutions that facilitate the use of community knowledge and builds local capacity. The SO addresses the high vulnerability of the NPA regions and their geographies (sparsely populated costal-, mountain-regions and islands) and sensitive natural environments to climate change. It also emphasises that traditional knowledge may play a key role in climate adaptation, with humans having a long history of adaptation from living in these extreme areas.

Impact: *The expected impact on the environment is positive. According to the draft programme, the SO aims at soft measures, that is, the use of community knowledge and building of local capacity, and not at hard technical infrastructure (e.g. against flooding), which tend to have negative environmental effects.*

Specific Objective 2.3 - Promoting the transition to a circular and resource efficient economy

This specific objective aims to contribute to the transformation of the economy towards greater circularity and resource efficiency. This includes improvements in production processes and waste management and changes in consumer behaviour and tackling resource efficiency in sectors such as the bio economy, blue economy, the building sector and infrastructure, food, and the use of by-products from production. Area-specific challenges will be addressed, for example, the costs of waste management or the tradition of self-reliance, reusing and repurposing in remote and sparsely populated areas.

Impact: *The expected impact on the environment is positive. In many NPA countries and regions, circular economy is on a par with waste management. Taking a broad perspective on the concept of circular economy, as suggested in the draft SO, will achieve the best possible environmental impact. Existing environmental issues which are most likely to be positively impacted are resource consumption, (air, water, soil) pollution and climate change.*

4.2.2 Priority 3: Strengthening the organisational capacity among NPA communities to make use of cooperation opportunities

Specific Objective 3.1 - Enhance institutional capacity of public authorities and stakeholders to implement macro-regional strategies and sea-basin strategies, as well as other territorial strategies

This specific objective aims to enhance the organisational capacity of public authorities and stakeholders in the NPA is to develop more resilient communities, in particular with a view to implementing Arctic policies and Arctic cooperation, recognising the unique circumstances and challenges of the Northern Periphery and Arctic Programme area compared to other parts of Europe. In particular, when in relation to demography, indigenous perspectives, peripherality, insularity and harsh conditions that also apply to Arctic cooperation. This includes working with natural and cultural heritage to protect, promote, and develop these important features for the programme area and develop wider territorial synergies and links to the benefit of the programme area.

Impact: *The expected impact on the environment is positive. According to the draft programme, the SO aims at increasing possibilities for effective participation of local communities in decision-making and building capacities for communities to be the masters of their own development.*

Recommendation: *Attention ought to be paid to potential conflicts of interest between economic development and environmental protection, considering the particular vulnerability and uniqueness of the Arctic (and near-Arctic) environment. Particularly sensitive areas are mining (new possibilities due to the thawing of permafrost soils in the Arctic), fishing and aquaculture industry (given high incidence in these regions, electricity consumption and generation of pollution) and shipping (new routes due to the melting of the ice shelves). The "promotion of natural and cultural heritage" hints at the further development of the tourism sector, which may put a high pressure on some popular spots which will locally lead to negative impacts on the environment, especially in vulnerable areas. In particular cruise shipping has to be critically assessed not only just in terms of environmental impact, but also regarding the impact of local culture and infrastructure (e.g. increased production of waste, increased refuse collection and ultimate disposal, and increased use of fresh water, waste water disposal, electricity in harbours, etc.). The channelling and management of visitors may be able to reconcile economic interest with environmental concerns.*

4.3 REASONABLE ALTERNATIVES

Consideration of the full range of possible actions and alternatives are important elements of the programme development process. A number of processes involved rounds of consultation, e.g. with programme regional advisory groups, stakeholder engagement, in depth discussion in the programme's content sub group and programme preparation group, inputs from external consultants based on their work on the area analysis, and engagement with the SEA team. The mix of processes allowed for a range of views and types of stakeholders to be involves, including internal programme perspectives, national views, regional and local inputs and external perspectives.

At the outset, all the Commission's proposed Priority Objectives were considered in terms of their links to the 1) needs of the programme area, 2) past programme experience and the 3) requirements for the 2021-2027programme period. Evaluating the Priorities and Specific objectives in relation to the NPA highlighted first, the significance of the PO2 and second, the environment and green development are central to actions across the full range of Priority Objectives, e.g. PO1 innovation in relation to environmental concerns, community engagement in environmental action links to PO 3 etc. The interrelationship between environment-related actions and the full range of priorities meant that working under POs 1, 3, 4 and 5 do not 'exclude' relevant actions.

Against this background, the programme preparation groups ranked each PO and their accompanying SO as more/less relevant. The main points of discussion in relation to alternatives to what was agreed was the inclusion, or not, of specific objectives under PO2, in large part discussions centred around the Programme's scope to deliver results given its potentially relatively modest financial resources, the transferability of some solutions on a transnational scale, and the Programme's aim to show progression and development in its areas of work. Alternatives discussed include the inclusion of:

P.O. 2 - A greener, low-carbon Europe by promoting clean and fair energy transition, green and blue investment, the circular economy, climate adaptation and risk prevention and management	
b) promoting renewable energy	This is a very important area of action for the NPA area. But, discussion noted the very high level of support from other domestic and EU policies for action and the capacity to support innovative actions through PO1. The NPA area is a world leader in this area and actions would most likely fall under innovation it is also worth noting the transnational applicability of the concepts, especially given that some areas already high levels of renewable take up and provision, most notably Iceland.
c) developing smart energy systems, grids and storage at local level	For some area of the NPA local storage capacity was a key concern, as was the high level of energy usage linked to cold climates. However, the transnational applicability of solutions was a point that was also considered and the scope for innovation and potential to fund under PO 1.

Although the decision was taken not to work with these PO in particular, the way in which the Programme has developed has allowed for work on these issues to be pursued where relevant. These opportunities are 'signposted' in the programme text, e.g. with PO1 noting 'green technologies' as a specific area of interest. So, the potential value of cooperation on these issues is not lost, but at the same time the Programme is considering where it can have the most direct benefits to the programme area.

4.4 CONCLUSIONS

The selected priorities and specific objectives (SO) are expected to have a neutral or positive environmental impact. They are also well aligned with regional, national and EU environmental policy objectives. Nonetheless, attention should be paid to unintended negative side or indirect effects of the co-funded interventions.

Table 2 summarises the assessment results using the QUASAR methodology (Galassi, G. and Levarlet, F. 2017), by parameterizing the characteristics of each potential interaction between the NPA programme and its natural environment on a scale 6 (positive and highly significant effect) to -6 (negative and highly significant effect). The outcome of the method is the Magnitude M of the expected effect. It is determined according to

$M = (i \times n) \times (c1+c2+c3+c4) \times v$ where

- *nature n* … denotes the nature of the effect, which can be positive [+1], if the interaction contributes to the achievement of an environmental objectives, or negative [-1] if the interaction counteracts the environmental objective.
- *interaction i* … denotes the interaction of the plan with the environment, which can assume the values 0 (no interaction) or +1 (interaction).
- *value v* … is a magnifying factor, which is +1, if the effect identified is not particularly critical and, in all other cases, it takes the value +1.5.
- *persistence of the effect c1* … is a criterion to define whether a condition is temporary [1] or permanent [0].
- *reversibility of the effect c2* … is a criterion to define whether the original state of the environment will be restored after the activity is finished, i.e. is reversible [0] or not [+1].
- *probability c3* … is a criterion to define how certain [+1] or not-certain [0] the effect is to happen.
- *spatial extension c4* … is a criterion to denote whether the effect is local (sub regional, less than the total coverage of the plan or programme) [0], or if it has a spatial extension beyond the territorial limits of the area covered by the plan or programme [+1].

Table 2. QUASAR assessment

Specific objective	Nature of effect	Interaction with environment	value	Persistence of effect	Reversibility of effect	Probability of effect	Spatial extension	Magnitude
SO 1.1	0	0	+1	1	0	0	0	0
SO 1.2	+1	+1	+1	0	+1	+1	0	4
SO 1.3	0	0	+1	1	0	0	0	0
SO 2.1	+1	+1	+1	0	+1	+1	0	4
SO 2.2	+1	+1	+1	0	0	0	0	0
SO 2.3	+1	+1	+1	0	+1	+1	0	4
SO 3.1	+1	+1	+1	+1	0	0	0	2

Policy objective 2b and c were discussed in the programming process as reasonable alternatives to SO 2.1, 2.2 and 2.3. They are, however, not expected to have a better environmental performance than the SOs selected.

Policy objective 2	Nature of effect	Interaction with environment	value	Persistence of effect	Reversibility of effect	Probability of effect	Spatial extension	Magnitude
b) promoting renewable energy	0	+1	+1.5	0	+1	+1	0	3
c) developing smart energy systems, grids and storage at local level	0	+1	+1.5	0	+1	+1	0	3

5 MONITORING OF ENVIRONMENTAL IMPACTS

Article 10 of the SEA Directive requires the monitoring of significant adverse environmental effects that may be the results of the plan or programme's implementation. Monitoring shall ensure that effects are identified at an early stage to be able to undertake appropriate remedial action. The monitoring of the compliance with the horizontal principle "sustainability" is also required under the Structural Funds Regulations. Operations selected should be in line with the horizontal principles. Synergies can therefore be sought between the monitoring of environmental impacts and horizontal principles.

Art. 10 of the SEA Directive does not contain any requirements on the mode of monitoring, however, the use of indicators ensures an effective and sufficient monitoring. A central task is the selection of appropriate indicators:

- **From existing sources:** Harmonised transnational data sets on a wide range of environmental indicators can be obtained from Eurostat (for SE, FI, and IE and, occasionally also for NO and IS) and the Nordic Statistics Database (SE, FI, NO, GL, IS, Faroe Islands). An overview of potential indicators is provided in Annex 3. Disadvantages of using any of these indicators are that data sets are mostly not complete for all NPA countries and that, in general, it is unlikely that the NPA will have any effect of a magnitude to be reflected in these national data. Nonetheless, two potentially interesting composite indicators (i.e. individual indicators compiled into a single index) to monitor the state of the environment in the NPA territory are "Viable ecosystems" and "Decoupling environmental pressure from economic development" provided by the Nordic Statistics Database.

- **Programme-specific indicators:** Alternative to the use of existing environmental indicators is the definition of Programme-specific ones. The advantage is that they can be better targeted to measure the interventions.

Table 3. Potential Programme-specific indicators

	Indicator	Unit
Policy Objective 1: Promoting innovative and smart economic transformation		
a.) enhancing research and innovation capacities and the uptake of advanced technologies	SMEs having undertaken a(n existing) green technology (i.e. a technology)	Number of SMEs
	Eco-innovations developed and transferred to SMEs	Number of SMEs
	Projected (estimated) annual energy/ resource savings as a results of Eco-innovations developed and transferred to SMEs	MJ / tons
b.) reaping the benefits of digitisation for citizens, companies and governments	Technology-driven solutions for public service provision / models and solutions facilitating the use of distance-spanning technology to overcome long distance to market leading to a decrease in energy demand for	Number
	Projected (estimated) annual energy savings as a results of a newly implemented technology-driven solutions for public service provision / models and solutions facilitating	MJ

	the use of distance-spanning technology to overcome long distance to market	
c.) enhancing growth and competitiveness of SMEs	(Transnational) SME networks with an environmental focus	Number
2.) Policy Objective 2 - A greener, low-carbon Europe by promoting clean and fair energy transition, green and blue investment, the circular economy, climate adaptation and risk prevention and management		
a.) Promoting energy efficiency measures	Energy efficiency or smart energy management concepts developed and transferred	Number
	Projected (estimated) annual energy/ resource savings as a results of projected (estimated) annual energy/ resource savings as a results of	MJ / tons
d.) Promoting climate change adaptation, risk prevention and disaster resilience	Population benefitting from transferred/developed solutions for climate change adaptation, risk prevention and disaster resilience	% of total population
e.) Promoting the transition to a circular economy	Population benefitting from transferred/developed solutions that promote resource efficiency, end-of-waste, and a better use of by-products	% of total population
	Population benefitting from transferred/developed solutions for community planning for the circular economy	% of total population
3.) Policy Objective 3 – Enhance institutional capacity of public authorities and stakeholders to the EU Arctic Policy, i.e. regional development issues of high relevance to the Arctic region, but not exclusively targeting Arctic regions		
Development and transfer of capacity-building concepts for upskilling local communities for resilience and good living conditions in Arctic and near-Arctic regions	Developed and transferred concepts for upskilling local communities for sustainable development	Number
	Population benefitting from increased skills for local sustainable development	% of total population
Development and transfer of concepts and models for the protection, promotion and development of the natural and cultural heritage in Arctic and near-Arctic regions.	Developed and transferred concepts/models that reconcile the protection, promotion and development of the natural and cultural heritage	Number
	Population benefitting from developed and transferred concepts/models that reconcile the protection, promotion and development of the natural and cultural heritage	% of total population

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7 ANNEXES

7.1 ANNEX 1 – METHOD DESCRIPTION AND DATA COLLECTION

The strategic environmental assessment of the Northern Periphery and Arctic Programme 2021-2027 was carried out in accordance with Chapter 6 of the Swedish Environmental Code and EU Directive 2011/42/EC. Specifically, the work included:

- Consultations with national and regional environmental agencies, documented in consultation reports;
- Appraisal of programme elements as to their potential impact (positive and negative) on the NPA environment;
- An environmental report summarising the results of the assessment;
- Suggestions for the implementation, monitoring and control of environmental considerations in the NPA Programme 2021-2027.

Further guidance on SEAs has been employed throughout the study, namely Swedish Environmental Protection Agency (2010) and European Commission (2004, 2013). Several steps have been considered in the conduction of the SEA (Figure 4). A particular challenge related to an SEA process is the related uncertainty of a yet undefined project and programme areas. For example, the NPA Programme only contains strategic provisions formulated as objectives and targets. Also, there exists no uniform method for assessing possible effects of plans and programmes on the environment, even though a host of methods have been developed, each applicable to different types of strategic actions and in different socio-political contexts. It is necessary to select the most appropriate one case-by-case.

Programme drafts have evolved and developed and, with uncertainties dominating the analysis (e.g. programme geography, budget, etc.), support for the intervention logics have had to adapt to changing needs and priorities. A robust and clear analysis frames the outputs of the support work, which is based on core methodological components (Figure 5), and done in a way that is useful and relevant to the Programme drafting team.

Figure 4: Key steps and questions in carrying out a SEA (Source: European Commission 2013 and modified)

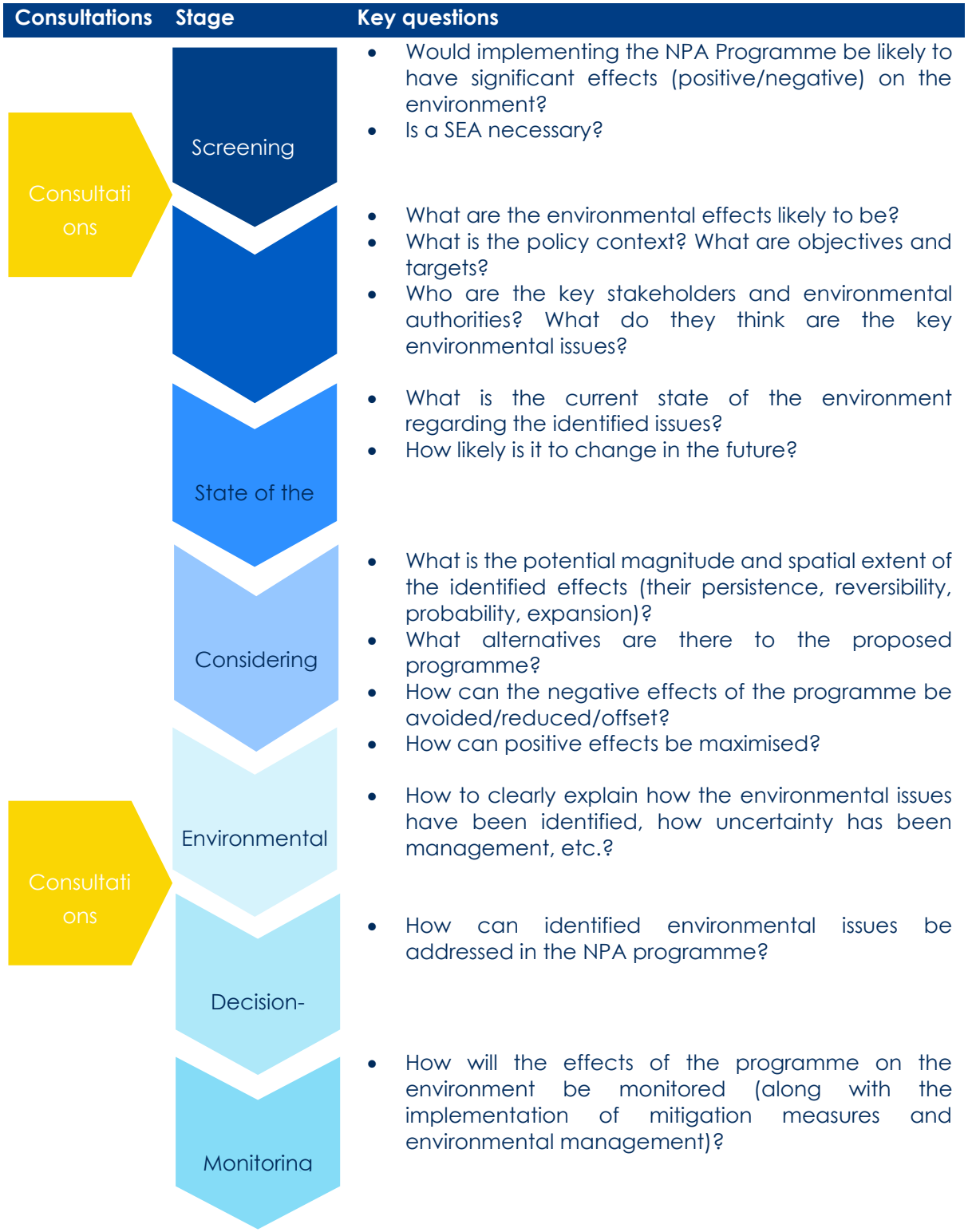


Figure 5: Three key components of the research methodology

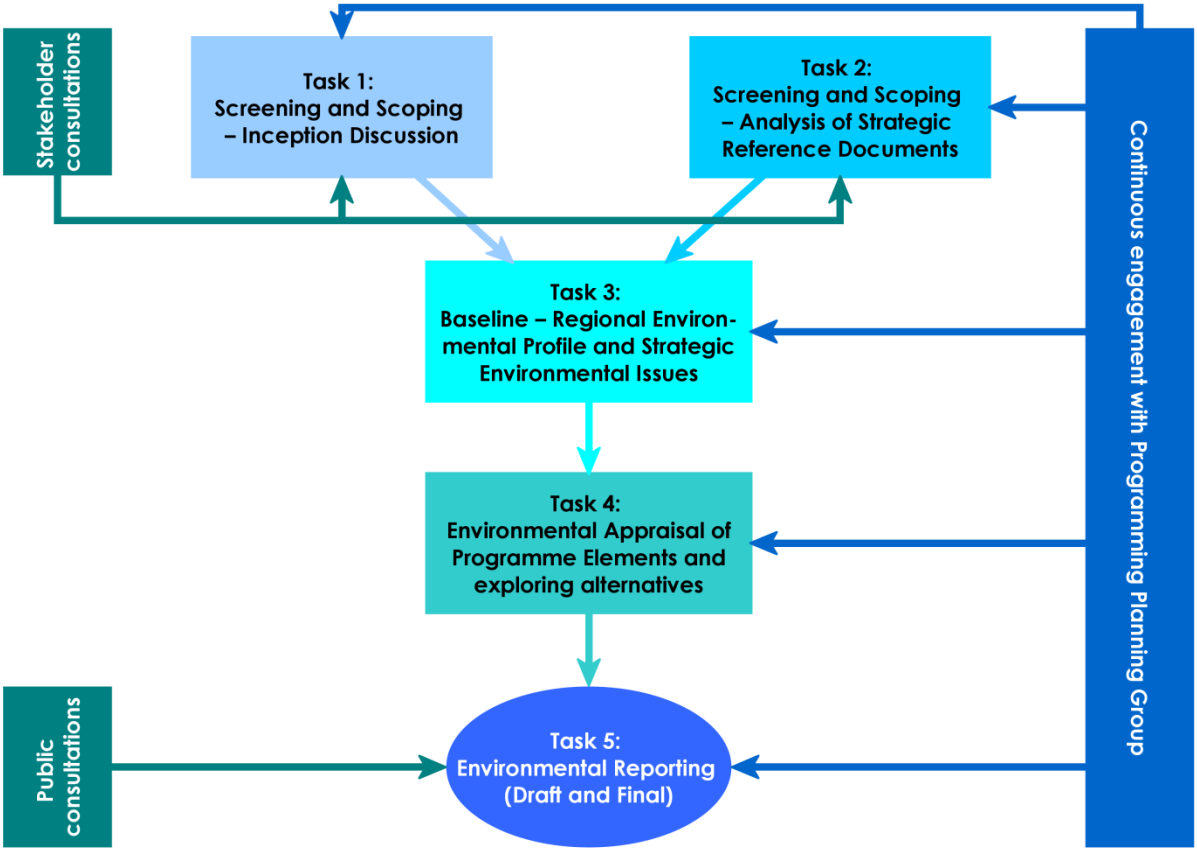
The framework within which the SEA of the Northern Periphery Programme has operated in comprises the preparation of (i) an Environmental Report, supported by (ii) a series of consultations, and (iii) the incorporation of the results into the decision-making process. The Environmental Report is an important tool for integrating environmental considerations into the preparation and adoption of programmes – it ensures that significant effects on the environment are identified, described and assessed and taken into account in an iterative process that should contribute to sustainable solutions in decision-making by the Programme Managing Committee. It will subsequently form the basis for monitoring the significant environmental effects of the programme.

The content of the Environmental Report is specified in Article 5 (1) and Annex 1 of the Directive, and the requirements for consultation - an inseparable part of the assessment - are listed in Article 2 (b) of the Directive, whereby certain authorities and members of the public should be granted an opportunity to express their opinion on the Environmental Report as well as the draft Programme.

7.1.1 SEA Tasks

In order to fulfil the Directive requirements detailed above, and drawing upon the additional guidance provided in the GRDP Handbook on SEA for Cohesion Policy 2007-2013, the SEA of the draft Programme was divided into the following tasks (Figure 6):

Figure 6: Tasks



Task 1: Screening and scoping – Inception discussion

As part of the overall inception discussion, this step involved the **scoping of the Environmental Report**, to confirm the range of documents to be reviewed and the breadth, depth and focus of the information to be included. Moreover, it included the timescales and the identification of a network of appropriate governmental or public authorities for information provision and consultation. Task 1 also focused on fine-tuning the methodological approach with the NPA Programme, discussed in an inception meeting taking place approximately one week following the award of the contract.

The **output of Task 1** was a short **Inception Report** developing the methodological and organisational approach in line with the inception meeting discussion and covering all above listed points.

Task 2: Screening and scoping – Analysis of Strategic Reference Documents

In a parallel and complementary process to the inception discussion, the SEA included a **review of key strategic documents** defining the operational environmental context for the Northern Periphery and Arctic Programme. This determined the extent to which the NPA is constrained or enabled by these various strategies, programmes or policies with regard to the scope for environmental impact. The programme strategy was evaluated as to its compliance

with regional and national policies, taking into account environmental impact and environmental legislation as well as strategic guidelines for cohesion.

Previous NPA operational programmes and associated evaluations were examined in this work to determine how these interventions have contributed to the environmental and sustainable development aspects of these strategic initiatives. National and European policy documents were reviewed to assess the consistency and coherence between the proposed plan or programme and the relevant policy objectives and targets for environmental protection.

Consultations were carried out to involve the environmental authorities and targeted stakeholder groups of the NPA programme countries (Table 3) to capture potential environmental issues of the draft programme.

Table 4 - NPA programme partner countries and regions.

Programme partner country	NUTS Code	Eligible region
EU Member States		
Finland	FI19	Länsi-Suomi (Keski-Suomi)
	FI1D	Pohjois-ja Itä-Suomi
Ireland	IE04	Northern and Western
	IE05	Southern (only NUTS 3 regions IE051 Mid-West and IE053 South-West)
Sweden	SE32	Mellersta Norrland
	SE33	Övre Norrland
Non Member States		
Faroe Islands	FO	Faeroerne
Greenland	GL	Greenland
Iceland	IS	Island
Norway	NO06	Trøndelag
	NO07	Nord-Norge
	NO0B	Svalbard and Jan Mayen

The SEA Directive requires early and effective consultation with authorities with 'specific environmental responsibilities' and the public affected or likely to be affected by, or having an interest in, the decision-making related to the plan or programme in question (Article 6). Consultations aimed at making use of environmental authorities' and stakeholders knowledge and opinions to highlight potential areas of environmental problems and opportunities for improvement in a timely and effective way. This engagement permitted significant ongoing national plans and SEAs that might have an influence in the scope of the NPA SEA to be taken into account in the programming process. Moreover, it allowed for the consideration of the current state of the environment regarding the issues and priorities identified and evolving trends, and the acknowledgement of possible available indicators for monitoring the environmental state.

The format and breadth of involvement and types of stakeholder groups involved were defined during the inception phase, but were continuously adapted throughout the process.

This was due to stakeholders' suggestion but also a result of the variance in response rate. In the end, the following authorities were consulted (Table 4):

Table 5 - Environmental authorities contacted and consulted

FINLAND
Finnish Ministry of the Environment

FAROE ISLANDS
Ministry of the Environment

GREENLAND
Greenland's Department of the Environment

ICELAND
Icelandic Regional Development Institute
Icelandic National Planning Agency

NORWAY
Norwegian Ministry of the Environment
Norwegian Environment Agency

REPUBLIC OF IRELAND
Irish Environmental Protection Agency

SWEDEN
Swedish Environmental Protection Agency

Consultation was done through an interview format through video or telephone call, but also with the possibility for consultees to answer in writing. Interviews lasted approximately one hour and notes were taken for the elaboration of consultation reports. The overall aim of the consultation was to address the question: *Would implementing the Northern Periphery and Arctic Programme be likely to have (significant) effects (positive/negative) on the environment?*

The consultation questionnaire followed the general structure in Box 1 below, based on the priorities defined by the NPA programme:

Box 1 - Consultation questionnaire

Innovative and smart economic transformation

- What are potential environmental effects of this priority and sub-objectives?
- What is the current state of the environment regarding the identified effects in your country? How likely is it to change in the future?
- How can the potential negative effects of the programme be avoided/reduced/offset? How can positive effects be maximised?
- Are there any relevant national strategies or other important documents on this environmental issue that we ought to take into account?

Promotion of energy efficiency measures (including smart energy management and the use of place based energy surpluses)

- What are potential environmental effects of this priority and sub-objectives?
- What is the current state of the environment regarding the identified effects in your country? How likely is it to change in the future?
- How can the potential negative effects of the programme be avoided/reduced/offset? How can positive effects be maximised?
- Are there any relevant national strategies or other important documents on this environmental issue that we ought to take into account?

Promotion of climate change adaptation, risk prevention and disaster resilience

- What are potential environmental effects of this priority and sub-objectives?

- What is the current state of the environment regarding the identified effects in your country? How likely is it to change in the future?
- How can the potential negative effects of the programme be avoided/reduced/offset? How can positive effects be maximised?
- Are there any relevant national strategies or other important documents on this environmental issue that we ought to take into account?

Promotion of a circular economy

- What are potential environmental effects of this priority and sub-objectives?
- What is the current state of the environment regarding the identified effects in your country? How likely is it to change in the future?
- How can the potential negative effects of the programme be avoided/reduced/offset? How can positive effects be maximised?
- Are there any relevant national strategies or other important documents on this environmental issue that we ought to take into account?

Arctic dimension

- Do you see any potential specific environmental effect on the Arctic?

The **outputs of Task 2** consist of the **identification of relevant environmental issues (positive and negative)** potentially affected by the NPA programme, and the identification of the relevant policy context in the NPA programme countries, as well as **seven consultation reports** (one per national consultation).

Stakeholder consultations were also carried out with Regional Contact Points. An overview of this is provided in Table 5 below.

Table 6 - Regional Contact Points Stakeholder Consultations - Overview from January 2021

Country	Consultation carried out	NPA templates used	Materials	Comments
Faroe Islands	Yes, physically	Partially	Text document answering SWOT and open questions	Includes suggestions for **future themes**. Minister attended and was very positive about project presentations
Finland	Yes, written	Yes	4 documents	Very detailed materials. Nice graphs explaining what is inspiring about TNC and **detailed expectations for the NPA 2021-2027**
Greenland	Yes, interviews	Yes	PDF answering all 3 parts	Includes suggestions for **future themes**
Iceland	Yes, written	Partially	SWOT and World Café	No suggestions for future programme.
Ireland	Yes, written	No	Survey results summary	Survey with 70 responses covered both Atlantic Area and NPA. Includes preference

				for **2021-27 specific objectives**.
Northern Ireland	Yes, written	Partially	Summary document open questions plus separate answer ICBAN	No suggestions for future programme.
Norway	No	-	-	-
Sweden	Yes	Partially	SWOT and world café	No suggestions for future programme.

Each NPA country was also encouraged to provide input through a survey regarding the relevance of themes and actions of the NPA 2021-2027 programme. This is summarised in Table 7-below.

Table 7 - Input of relevance to themes and actions NPA 2021-2027 programme.

Country	Summary of suggestions for future NPA 2021-2027 themes
Faroe Islands	• Energy. Energy efficiency and directly at buildings. • Blue bio economy • Place based opportunities. In connection with tourism, but also in other areas such as covid19 • Energy and ships. Most of the fossil usage is in ship transport. • Migration. In migration, will there be an influx of people in a post-pandemic world.
Finland	Themes: • Climate change, biodiversity, sustainable development, green technology • innovation • entrepreneurship • vitality of regions • transnational projects which bring benefits to local communities • health care /welfare in the Arctic • science communication and data verification • utilize the full potential of NPA-area's natural and human resources Other expectations: • clearly defined, ambitious themes • demand for more concrete and relevant projects • allow infrastructure investments, e.g. in museum or science centre exhibitions • lower threshold for smaller actors to take part in NPA-projects (sub-partnerships) • answer more quickly to present challenges • focus on future work and building networks
Greenland	• More focus on Sustainable Development Goals • More focus on Blue Economy • More focus on KPI's once the projects are running. We need more successful projects. • Entrepreneurship is an important developmental area for us • With focus on access to market barriers for rural areas

	• Less administration • More bottom-up
Ireland (Note: survey answers apply both to NPA and Atlantic Area)	• Top 3 P.O.s: Greener Europe (71%), Smarter Europe (47%), More Connected Europe (26%) • Top 3 S.O.s Smarter Europe: SME competitiveness (48%), reaping benefits from digitization (46%), enhancing research & innovation capacities (44%) • Top 3 S.O.s Greener Europe: smart energy systems and grids (34%), climate change adaptation (34%), circular economy (33%) • No comments on ISO 1.

Task 3: Baseline – Regional Environmental Profile and Strategic Environmental Issues

Environmental baseline information was obtained to provide an informed overview of environmental problems in the programme area and to document the status quo. This facilitated the preparation of an environmental SWOT analysis, identifying strengths, weaknesses, opportunities and threats, from which programme-specific Strategic Environmental Issues were identified. Within the programming process, this will subsequently inform the identification of environmental targets/guidance to encourage projects that develop strengths and address weaknesses.

Furthermore, the assessment of the environmental baseline not only considers the current state of the environment, but also analyses its likely evolution without the implementation of the programme, e.g. by means of scenarios and proxy indicators to analyse and present a range of possible outcomes or pathways.

The **output of Task 3** is an **environmental SWOT analysis** of the programme area.

Task 4: Assessing effects and considering alternatives – Environmental Appraisal of Programme Elements and exploring alternatives

Cohesion programmes are expected to incorporate estimates of the likely environmental impacts resulting from programme implementation. For a range of themes, this can act as a tool to estimate the scale of desired impacts, set targets for environmental impact, and attract projects to meet these demands. Insofar as possible, these estimates should be quantitative. Negative impacts identified should be countered with mitigation measures in the draft Programme. The discussion of possible alternatives was thus documented in the Environmental Report (task 5).

Utilising the materials from the steps described above, the task seeks to integrate all environment-relevant factors into the Programme drafting process as the programme elements are produced. From an environmental perspective, this includes ongoing and interactive structured appraisal of environmental integration within the hierarchy of:

(i) Development objectives and priorities;

(ii) Measures and eligible activities; and

(iii) Project or activity selection criteria.

Potential alternatives to avoid or reduce the identified effects are explored in close cooperation with the Programme Planning Group (e.g. choosing different programme priorities, objectives, actions, selection criteria, etc.). For a structured assessment of each environmental impact (positive or negative) and the different alternatives, the QUASAR method is used (see description below).

Other features considered as part of Task 4 included:

- Whether monitoring indicators are available, accessible and measurable;
- The appraisal of cumulative effects of the individual environmental impacts;
- The appraisal of environmental targets and their feasibility in relation to past performance; and
- Assessment of the planned organization for implementation, monitoring and control of environmental considerations.

The **output of Task 4** is the **appraisal of programme elements** and **exploration of alternatives** to the proposed programme objectives, measures, eligible activities and selection criteria. An assessment was concluded on how the programme affects the environment and whether programme strategies, priorities and targets are relevant from an environmental point of view. Alternatives are described both in qualitative terms and in terms of QUASAR ranks.

QUAlitative Structural Approach for Ranking (QUASAR) the Environmental Effects

The QUAlitative Structural Approach for Ranking (QUASAR) (Galassi & Levarlet, 2017) is a qualitative approach for the assessment of environmental effects and for the ranking of different possible alternatives. It allows an easy comparison of different alternatives and avoids the bias introduced through the subjective judgment of the assessor by providing a result, which can be easily reproduced. QUASAR "quantifies" the environmental effects on a previously determined scale through the parameterization of the characteristics of each potential interaction between the plan or programme and its natural environment. The outcome of the method is the Magnitude M of the expected effect. It is determined according to:

$M = (i \times n) \times (c1+c2+c3+c4) \times v$ where

nature n … denotes the nature of the effect, which can be positive [+1], if the interaction contributes to the achievement of an environmental objectives, or negative [-1] if the interaction counteracts the environmental objective.

interaction i … denotes the interaction of the plan with the environment, which can assume the values 0 (no interaction) or +1 (interaction).

value v … is a magnifying factor, which is +1, if the effect identified is not particularly critical and, in all other cases, it takes the value +1.5.

persistence of the effect c1 … is a criterion to define whether a condition is temporary [1] or permanent [0].

reversibility of the effect c2 … is a criterion to define whether the original state of the environment will be restored after the activity is finished, i.e. is reversible [0] or not [+1].

probability c3 … is a criterion to define how certain [+1] or not-certain [0] the effect is to happen.

spatial extension c4 … is a criterion to denote whether the effect is local (sub regional, less than the total coverage of the plan or programme) [0], or if it has a spatial extension beyond the territorial limits of the area covered by the plan or programme [+1].

The magnitude of expected effects (M) can range between -6 and +6. To facilitate the communication of the results of the assessment, the effects of each nature (positive and negative) are divided into three classes.

Figure 7. Ranking the magnitude of environmental effects

4 > M ≤ 6	Positive and highly significant effect
2 > M ≤ 4	Positive and significant effect
0 > M ≤ 2	Positive, but not significant effect
M= 0	No effect
-2 ≥ M < 0	Negative, but not significant effect
-4 ≥ M < -2	Negative and significant effect
-6 ≥ M < -4	Negative and highly significant effect

Task 5: Environmental reporting – Draft and Final Environmental Reports

Results of Tasks 1-4 are summarised in the **draft and final SEA report**.

The draft Environmental Report was made available in March 2021 along with the draft Programme. Comments and opinions were sought from the broader NPA constituency of actors as part of programme consultations. Where appropriate, modifications were made to the draft report to reflect concerns.

7.2 ANNEX 2 – DETAILED MACRO-TABLE OF ENVIRONMENTAL POLICIES IN THE NPA AREA

	Strategies	Timeframe	Summary	Main themes/Priorities	Theme
Faroe Islands	2011 Comprehensive plan for electric energy		Detailed analyses, conclusions and recommendations.	The current situation in the Faroes is thus: - The greater portion of heating and more than half of theelectricity production is from oil; - Industry is extremely dependent on oil; - Transport to and from the Faroes and on land is dependent on oil; - There is considerable wind and strong tides available for renewable energy production; - There is ample hydropower, which might also be exploited as a source of energy storage. Main themes analysed: - Electrification: - Electricity production; - Grid elements and grid management; - Economy; - Relevant legislation and organisation.	Territorial strategies/co operation
Finland	2020 Interim Report on the ICT sector, climate change and the environment	2020-2035	Examines ICT sector's role in climate and environmental issues and in enabling a sustainable transition.	Two main topics: (1) infrastructure, (2) applications. Solutions in: - Heat & power production, distribution and through use of machine learning, diagnostics, maintenance, optimisation, smart grids, etc. - Energy sector digitalisation in weather-dependent energy production and automation; - Electronic Data Interchange (EDI) in logistics; - Climate change, environmental research, biodiversity and circular economy; - Less need for mobility, better access to content, e.g. in public and consumer services; - Smart farming and smart cities;	Energy and climate change

				- Robotics, blockchains, AI and others.	
Finland	National urban strategy	2020-2030	Defines partnership between cities and central government. Seeks to strengthen the provision of socially sustainable, climate-smart and vibrant cities. Strategy expands on national urban policy and responds to the opportunities and challenges of urbanisation, considering UN's New Urban Agenda goals.	- Wellbeing for everyone – Improved preconditions transferred from one generation to another. Basic public services designed to improve the wellbeing of residents; - The vibrant city - natural platform for expertise, research & innovation, and business. Public service production and collaboration structures support skills development and employment; - Well-functioning connections - People and goods move smoothly and sustainably. A full-scale digital data leap is possible with well-functioning communications, connections and interfaces. Accessibility is a key factor to nation-wide success. - The climate-smart city - Moving around the city in a sustainable way. Cities warm up with renewable energy and produce renewable electricity in many ways. Each city is a biodiverse nature city.	Energy and climate change
	2020 Water management guidelines for agriculture and forestry		Describe the environment where water management in agriculture and forestry takes place and the societal expectations involved in this. Sets targets for future actions. Examines the role of water resources management in ensuring sustainable	Measures in six spheres, with the following examples: - Governance measures – avoiding drainage in peatlands in a natural state; - Financing – securing and developing investment aid for subsurface drainage; - Planning and implementation – taking groundwater areas into consideration in drainage, prolonging water retention in rural areas; - Research and development – investigating needs to develop irrigation, implementing a study on drainage status and needs; - Education, training and advice – provision of training for officials, planners and contractors;	Energy and climate change

			food production and bioeconomy.	- Digitalisation – developing new mapping methods and digitalisation in administrative procedures.	
Finland	Annual climate report 2020	2020-2030	The Government submitted its second Annual Climate Change Report to Parliament on Wednesday 17 June. According to the report, the measures included in the Climate Change Policy Plan to 2030 are likely to be sufficient to reach the present reduction targets for greenhouse gas emissions set for both 2020 and 2030.	Key points from report: - Considerable reductions in emissions trading sector in 2019, less decrease in other sectors - Some decrease in emissions from the transport sector, but not enough - Forest carbon sink now stronger, emissions from agriculture the same as before - In relative terms the highest emission reductions in heating of individual buildings and waste management - Municipal climate objectives not yet reflected nationally as emission reductions, carbon footprints of households is growing - Adaptation even more urgent as economic losses caused by accelerating global warming and extreme weather have increased - Annual climate change report is based on the climate change act	Energy and climate change
	2020 Report on the implementation of the 2030 agenda for sustainable development	2020-2030	Captures the main achievements, key changes, existing challenges, emerging issues and lessons learned between 2016 and 2020 in Finland. Focuses on progress in 17 SDGs and 169 targets.	Key challenges: (1) consumption and production patters, (2) climate action, and (3) conservation of biodiversity. Solutions in multi-stakeholder approach, Universal Social Security and service systems, education access, sustainable development budgeting and integration of environmental sustainability into policy. Agenda 2030 as guiding framework for some ministries, national research programmes and innovation ecosystems.	Energy and climate change

Finland	2019 Integrated national energy and climate plan	2021-2030	Contains national targets and related policy measures to achieve EU's 2030 energy and climate targets. Outlines impact of existing policy measures on projected evolution of greenhouse gas emissions, renewable energy and energy efficiency up to 2040.	Strategic themes: (1) decarbonisation, (2) energy efficiency, (3) energy security, (4) internal energy market, (5) research, innovation & competitiveness. Examples of targets: - Carbon neutrality by 2035; - World's first fossil-free welfare society; - Strengthen carbon sinks and stocks in the short and long term; - Share of transport biofuels to be increased to 30%; - Obligation to blend light fuel oil used in machinery and heating in 10% of bioliquids; - Production of cost-effective, renewable energy, increasing the share in end consumption to 50% and self-sufficiency to 55%; - Emission reduction target of 39% compared to 2005.	Energy and climate change
	2019 Report on suitability of habitat types for biodiversity offsetting		Investigates the applicability of biodiversity offsetting to habitat types occurring in Finland from the perspective of compensation and deterioration. Included 99 different habitat type groups, classified as either suitable, possibly suitable or generally unsuitable for biodiversity offsetting.	Conditions for biodiversity offsetting in Finland are quite good, with more than 41% of assessed habitat types deemed suitable for biodiversity offsetting, and only 10% found unsuitable.	Energy and climate change

	Roadmap for the Circular Economy 2.0	2020-2025	Aim of helping Finland making the transition to an efficient economy, with consumption based on the use of services and not ownership. Builds on 2016 roadmap.	Vision: carbon neutral circular economy by 2025. Strategic goals; - Renewal of the foundations of competitiveness and vitality; - Making a shift to low-carbon energy; - Natural resources regarded as scarcities; - Everyday decisions as catalysts for change. Examples of actions: - Bio and Circular Finland programme financing internationally competitive circular economy solutions; - Tools for manufacturing industry to help companies make the transition; - Circular economy criteria for the construction sector.	Circular economy
Finland	Marine Strategy	2016-2021	Definitions of good environmental status, targets and assessment of the state of the marine environment.	Action plans: - Nutrient loading and eutrophication must be cut in waters by at least 440 tonnes of phosphorous and 6600 tonnes a year in relation to the average level in 2006-11; - Sustainable fishing and hunting as key objectives, with a maximum sustainable yield; - Prevent introduction of invasive alien species and slow down their rate of spread, namely by marine transport (achieved in 2012); - Curtail littering of sea and beaches; - Reduce underwater noise pollutions (e.g. propeller noise and underwater civil engineering projects); - Reduce physical damage to the seafloor; - Prevent hydrographic changes; - Maritime safety and risk management (e.g. emissions); - Maritime spatial planning measures; - Strengthen marine protected area network and other nature conservation activities.	Marine and coastal environment

Finland	2016 Revised Arctic Strategy		Government policy regarding the priorities in the updated Arctic strategy.	- Aim to strengthen security policy stability in the Arctic and enhance vitality of the region; - Finland as leading actors in international Arctic policy; - Produce key solutions to problems in Arctic development; - Promote interests of indigenous peoples; - Achieve significant impacts on growth and employment at the domestic level by developing Arctic region, namely the cleantech and bioeconomy sectors; - Respond to climate change and environmental protection challenges through international cooperation; - Remove barriers to free movement of labour in the Nordic countries; - Enhance use of existing aid instruments.	Arctic
	2017 Arctic action plan		Sets out the action plan for the update of the Arctic Strategy concerning specific priorities	Sets out key measures under the following broader priorities: - Arctic Foreign and EU policy - Commercialisation of Arctic expertise - Sustainable tourism - Infrastructure	Arctic
	Study on Arctic mining in Greenland		Overview of the geography, climate and mining market and context in Greenland. Aims to provide a foundation for new opportunities and partnerships in the Arctic.	Greenland with relatively weak record of mining activity contrasted with existing world class mineral deposits. Taxation more favourable for the mining industry (25%) compared to other businesses (26.5%). Mining companies receiving funds from Danish-Greenland investment partnership. Mineral exploration and mining in remote areas, resulting in logistics issues. But climate change making the region more accessible.	Arctic

				Deep fjords offering opportunities for deep-sea port and shipping capacity.	
Finland	Regional development decision	2020-2023	Establishes priorities based on regional strengths and steers the development of the different administrative branches and regions. Aim to create a dynamic, thriving and socially strong Finland.	Six key priorities: - Mitigating climate change and safeguarding biodiversity; - Building sustainable communities with good connections; - Innovating business life and accelerating R&D&I; - Making skills and education a resource for regional development; - Increasing inclusion and wellbeing and preventing inequality; - Creating an operating model for regional development. Cross-cutting themes of sustainable development and digitalisation.	Territorial strategies/co operation
Greenland	2016 Sustainability and growth plan		Proposals to achieve sustainability in public finances and the implementation of a process towards a self-sustaining economy through development of the business basis.	Main themes: (1) higher level of education, (2) boost growth and conversion to a multi-faceted economy, (3) modernisation of the public sector, (4) greater self-sufficiency through reforms of welfare benefits, the tax system and housing.	Territorial strategies/co operation
Iceland	Climate change strategy	2007-2050	Third climate change strategy adopted by the Icelandic government. Framework for action and government involvement. Contains	Long-term vision for the reduction of net emissions of greenhouse gases by 50-75%, using 1990 figures as baseline. Five main objectives: - Fulfilment of international obligations according to the UNFCCC and Kyoto Protocol;	Energy and climate change

			statistical indicators and provisions for measures to be adopted to achieve main objectives, aiming for mitigation and adaptation.	- Emissions reduced with special emphasis on reducing use of fossil fuels in favour of renewable energy sources and climate-friendly fuels; - Increase carbon sequestration through afforestation, revegetation, wetland reclamation and changed land use; - Foster R&I in climate change-related fields; - Prepare adaptation to climate change. Indicators include: glacial developments, temperature trends, CO2 concentration, emission levels, fuel sales, number of vehicles, etc.	
Iceland	2014 OECD environmental performance review		Review of Iceland's environmental performance. Overall, Iceland's environment is in a good state but there are ways in which it can be improved.	Key points: - Iceland's environmental quality is generally good - Some environmental pressures are of concern such as soil erosion and pressure on biodiversity - Iceland has made progress in streamlining the institutional and policy framework for environmental management - Policy interest in green growth, use of economic instruments and promotion of eco-innovation has risen - Iceland adopted an innovative approach to land-use planning for energy projects - There is scope for energy savings in the residential and transport sectors - Iceland's nature is a key tourism asset, but it is coming under increasing pressures - Ensuring the environmental sustainability of tourism is a major challenge	Energy and climate change
	Seventh national communication and third biannual report 2018		Overview of national context, greenhouse gas inventory information, policies and measures, and projections.	Key points: - Likely total emission will increase up to 53% in best case scenario and 71% in mid case scenario. Main increase in intensive industry under ETS-system;	Energy and climate change

				- Main contributors to emissions are industrial processes (45%), energy sector (37%), agriculture (13%) and waste (5%); - Land use and forestry is an important sector, figuring prominently in the country's climate policy from the start.	
Iceland	Climate action plan	2018-2030	Intended to boost efforts in cutting net emissions to meet Paris Agreement targets for 2030 and make Iceland carbon neutral before 2040.	Climate change will have a big impact on Iceland and its waters, with almost all of Iceland's glaciers receding and largely vanishing in the next 100-200 years if warming trends are not halted. Key themes and concerns: - Ocean acidification; - Almost all electricity and heating is currently provided by renewable energy, hydro and geothermal; - Main emissions (exc. land use) in fossil fuels for cars and ships and industrial processes; Emphasis on two measures: - Phase out fossil fuels in transport; - Increase carbon sequestration in land use, by restoration of woodlands and wetlands, revegetation and afforestation. Examples of actions include: - Launching new fund to support low-carbon technology; - Phase-out landfilling organic waste; - Phase out programme for climate-warming chemicals; - Public education campaigns; - Participation in emissions trading for industry and aviation and other sectors.	Energy and climate change

Iceland	2015 Resource efficiency and material use		Prepared as part of the 2015 EEA of material resource efficiency policies.	No specific material resource efficiency policies have been made. Focus on increased recycling to reduce use of primary resources, and on reducing waste production. Sectors/products include: batteries, waste electrical and electronic equipment (WEEE), organic waste, tyres and industrial waste, heavy industry, fisheries, agriculture, transport, food waste, plastics, textiles, paper, and buildings (housing).	Circular economy
	2011 Arctic strategy		Overarching policy on Arctic issues aimed at securing Icelandic interests with the regards to the effects of climate change, environmental issues, natural resources, navigation and social development, as well as strengthening relations and cooperation.	Twelve principles: - Promoting and strengthening the Arctic Council; - Securing Iceland's position as a coastal State within the Arctic region; - Promoting understanding of the geography of the Arctic region; - Resolving differences related to the Arctic on the basis of the United Nations Convention on the Law of the Sea; - Strengthening and increasing cooperation with the Faroe Islands and Greenland; - Supporting the rights of indigenous peoples in the Arctic; - Building on agreements and promoting cooperation with other States and stakeholders; - Prevent human-induced climate change and its effects to improve the wellbeing of Arctic residents and communities; - Safeguard security interests in the Arctic region through civilian means and working against militarisation of the Arctic; - Develop further trade relations between States in the Arctic region; - Advance Icelanders' knowledge of Arctic issues and promote Iceland abroad;	Arctic

				- Increase consultations and cooperation at the domestic level on Arctic issues.	
Iceland	The regional policy of Iceland	2018-2024	Outlines the framework for regional support set out for 2018-24.	Main Goals: - Address depopulation in individual regions - Address the lack of economic and industrial diversity - Support technological changes - The development and adaptation of individual industries - Outline necessary adaptation measures to counter the impacts of climate change - Ensure smooth communications and access to services - Respond to increasing international competition for people and companies	Territorial strategies/co operation
	National planning strategy	2015-2026	Tool for managing all planning in Iceland. Created on the basis of the planning act. Sets out planning for ocean and coastal areas as well.	Intended to ensure common interests in local authority plans and to support sustainable development and efficient planning. Coordinates policymaking on land use on both state and local authority levels. Coastal planning is intended to promote the protection and maintenance of ecosystems, provide a basis for diverse utilization, reduce conflicts between different activities and promote better and more informed decision-making on projects and activities.	Territorial strategies/co operation
Ireland	2014 Offshore renewable energy development plan		Framework for the sustainable development of Ireland's offshore renewable energy resource. Overview of policy context, resources and opportunities, and SEA.	Significant growth in renewable electricity generation output driven by onshore wind (15.3%), with 19.6% of electricity demand met by renewable sources in 2012. Three goals: - Harnessing market opportunities presented by offshore renewable energy to achieve economic development, growth and jobs; - Increase awareness of value, opportunities and societal benefits of developing offshore renewable energy;	Energy and climate change

				- Offshore renewable energy developments to not impact marine environment. Examples of actions: - Increase exchequer support for ocean research, development and demonstration; - Introduce initial market support tariff for ocean energy; - Develop renewable electricity export markets; - Develop supply chain for the offshore renewable energy industry; - Ensure appropriate infrastructure development.	
Ireland	2019 annual transition statement		Overview of climate change mitigation and adaptation policy measures. Contains record of GHG emissions and projection for future emissions.	2015 commitment to provide at least €174 million in public funding on climate action in 2016-20, with more being spent in just two years (€194.4 million). Examples of milestones reached since Climate Action Plan: - New scheme for 1200 on-street public charge points for electric vehicles, led by local authorities; - New rules for public procurement, with €12 billion of sustainable state investment per year; - Climate action focused budget; - Retrofitting model taskforce established; - New governance arrangements (e.g. Climate Action Delivery Board, publication of quarterly progress).	Energy and climate change
	Department of Communications, Climate Action & Environment annual report 2019	2019-2021	Annual report on progress in meeting the objectives set out in the Statement of Strategy.	Goals: (1) Climate leadership, with focus on, e.g., cutting GHG emissions by at least 30% by 2030, deliver 70% renewable energy on the power grid, and energy efficiency in public sector; (2) Connectivity and communications, e.g. delivery of high-speed broadband to every premise in Ireland; (3) Environment and sustainable resource use, e.g. prioritising environmental protection in areas of air quality and safe use of chemicals, and mainstreaming sustainable development;	Energy and climate change

				(4) Governance and regulation, e.g. balancing accountability and independence, and regular reviews of regulatory mandates. Sectoral adaptation plans in: - Seafood, agriculture and forestry; - Biodiversity; - Built and archaeological heritage; - Transport infrastructure; - Electricity and gas networks; - Flood risk management; - Water quality and water services infrastructure; - Health.	
Ireland	2019 Communications sector climate change adaptation plan	2020-2050	Assessing the communications sector, by identifying areas of vulnerability, steps and measures to avoid or minimise adverse impacts, and exploit opportunities.	Overarching policy focus to build resilience to the impacts of climate change. Examples of objectives: - Enhance cooperation and communication; - Communications networks companies to continue to ensure climate change is considered in planning and design standards and engineering management practices; - Identify areas vulnerable to impacts of climate change; - Identify measures required to adapt to climate change impacts on vulnerable infrastructure; - Continue to develop and improve timely communication to customers during weather events.	Energy and climate change

Ireland	2019 Electricity and gas networks sector for the climate change adaptation plan	2019-2050	First adaptation plan for the energy networks sector prepared under the National Adaptation Network.	Biggest risks to Ireland associated with climate change: extreme floods, precipitation and storms. Temperate increase in 1900-2012 at a total of 0.8°C. Main objectives: - Energy sector climate change research; - Continue to build on adaptation measures already in place; - Mainstream climate change adaptation; - Diversification of the electricity generation portfolio; - Collection of baseline data and costs from past extreme weather events; - Enhance cooperation and communication between stakeholders on a national and international level; - Energy network companies to continue to ensure climate change is considered in planning and design standards and engineering management practices; - Identification of areas vulnerable to impacts of climate change; - Identify tailored measures required to adapt to climate change impacts on vulnerable infrastructure; - Develop and improve timely communications to customers during weather events. Increase public awareness of measures being taken to ensure public support for the benefits being provided by Climate adaptation actions.	Energy and climate change
	Project Ireland report on investing in the transition to a low carbon and climate-resilient society	2018-2027	Overview of context of measures and of investment in transition.	Overview of investment: - Climate Action Fund - €500 million; - Renewable Electricity and Energy Efficiency - €20.3 billion; - Sustainable Transport - €8.6 billion; - Agriculture and Forestry - €4 billion; - Climate and Resilience through Flood Defences - €940 million.	Energy and climate change

Ireland	2020 long-term renovation strategy	2020-2050	Includes Ireland's existing building renovation policies which are set out in a range of policy documents.	Key information (measures, targets & trends): - Advance performance requirements with a mandatory renewables requirement, creating a rapid transition to low carbon heating systems; - Public Sector Energy Efficiency Strategy and its associated support programme assisting public bodies in achieving the national energy efficiency targets of 33% 2020, and 50% by 2030, including public buildings; - Energy efficiency improvement of 16% relative to the 2001-05 baselines is anticipated by 2020; - National Development Plan has allocated funding of €4.5 billion to support energy efficiency improvements across the residential and public sector; - Committed to increasing the price of carbon to €100 per tonne by 2030 in the Programme for Government; - Smart Readiness Indicator in development to rate the building on a scale to indicate its communication & interface potential, and capabilities for more efficient operation.	Energy and climate change
	National energy efficiency action plan	2017-2020	Sets out progress towards the efficiency target and the measures to maximise progress. Provides overview of national targets and savings.	Target of 33% improvement in energy efficiency for the public sector. Examples of new and potential measures: - Improvements to the BEP; - Enhancement of Building Energy Certificates; - Expansion of Energy Efficiency Obligation Scheme; - Better support to public sector bodies to help them achieve targets; - Better Energy Communities Programme to support sustainable energy upgrades to clusters of buildings; - Awareness, education and promotion; - Cost Effective Energy Efficiency improvements in Electricity Infrastructure.	Energy and climate change

Ireland	2017 National mitigation plan and SEA	2017-2022	Sets out Government's shared approach to reducing greenhouse gas emissions. Proposes measures to be implemented for transitioning to a low carbon, climate resilient and environmentally sustainable economy. SEA statement providing information on decision-making process and documents. Provides summary of mitigation measures adopted or missing from plan.	Main focus areas : climate action, decarbonising electricity generation, decarbonising transport, approach to carbon neutrality for agriculture, forest and land use sectors, Examples of actions: - Ensure climate considerations are fully addressed in new National Planning Framework; - Develop a regulatory policy for electricity interconnectors; - Identify the most suitable replacement low carbon technology for the Moneypoint generation plant; - Support schemes like Renewable Energy Feed-in-Tariff and Ocean Energy Prototype Development Fund; - Maintain grant scheme for electric vehicles; - Sustain current Biofuels Obligation Scheme to ensure these continue to be an increasing part of the road transport fuel mix; - Mobilise forest biomass.	Energy and climate change
	2015 Offshore oil and gas environmental report and SEA	2015-2020	Review ensures future exploration and production activities will comply with existing policies, plans and programmes. Proposes monitoring measures.	Examples of proposed mitigation measures: - All equipment used on the rig/ship should have safety measures built in to minimise risk of oil spillage; - Rigs should be located as far from the shore/coast as possible; - Geophysical and geotechnical survey plans and specifications should seek early archaeological input. Enhancement measures proposed under the following topics: seismic (e.g. ocean circulation, marine heritage and archaeology, marine life), drilling (e.g. sea birds, geology, seabed features).	Energy and climate change

Ireland	Strategy to combat energy poverty	2016-2019	Builds on previous strategies and existing schemes to develop new programmes and effective ways to focus energy efficiency efforts on those most at risk.	Energy poverty in Ireland is strongly correlated with basic deprivation, a function of inadequate resources. People living in rented accommodation are twice as likely to live in less energy efficient housing. Examples of measures: - Annual reports from Ministers to the Committee on Social Policy and Public Service Reform; - New expert Advisory Group on energy poverty to ensure government policy keeps abreast of latest research and advise on measures and tracking methodology; - Pilot action to allow landlords participating in the local authority-led Housing Assistance Payment (HAP) schemes to receive free energy efficiency upgrades, alongside tax credits.	Energy and climate change
	Sustainable development goals and national implementation plan	2018-2020	Sets out how Government will implement the SDGs and support other countries to do the same through Irish Aid. Includes actions specifically aimed at communicating how the SDGs relate to everyday life.	Strategic priorities: awareness, participation, support and policy alignment. Specific challenges for Ireland in 2018 relate to housing, levels of obesity, achieving sustainable consumption patterns, halting decline in biodiversity and habitat destruction, mitigating and adapting to climate change, reducing youth unemployment, reducing poverty, addressing entrenched inequalities and mainstreaming a gender perspective into policy. Examples of actions: - SDG Interdepartmental Working Group to develop a strategy around communicating Ireland's key SDG priorities to national and international audiences; - Develop an online SDG platform; - Select limited number of national organisations to act as 'SDG Champions'.	Energy and climate change

	White paper on transition to a low carbon energy future	2015-2030	Sets out a vision and a framework to guide Irish energy policy.	Aim to reduce GHG emissions from the sector by at least 80% (compared to 1990 levels) by 2050. Six priority energy policy areas: - Empowering energy citizens; - Markets and regulations; - Planning and implementing essential energy infrastructure; - Ensuring a secure energy mix; - Putting the energy system on a sustainable pathway; - Driving economic opportunity. Examples of actions: - Create conditions for entrepreneurs to develop and commercialise business models that will assist the transition; - Develop a framework to strengthen oil, gas and electricity emergency plans; - Commission research on future demand for fuel sources and interconnection requirements.	Energy and climate change
Ireland	2019 National energy & climate plan	2019-2030	Incorporates all planned policies and measures identified up to the end of 2019 which collectively deliver a 30% reduction by 2030 in non-ETS GHG (from 2005 levels).	Focus areas: - Built environment; - Transport; - Agriculture, forestry and land use; - Renewable energy; - Alternative routes to market; - Offshore wind; - Increased electricity interconnection; - Alternative sources of energy to fossil fuels; - District heating; - Cross-border participation in support schemes: - Circular economy; - Carbon capture & storage.	Energy and climate change

	Waste action plan for a circular economy	2020-2025	Addresses how resources are perceived more broadly, capturing and maximising the value of materials. Identifies opportunities for the application of circular economy principles.	Objectives: - Ensure materials & products remain in useful for longer, preventing waste and supporting reuse; - Make producers who manufacture and sell disposable goods for profit environmentally accountable for the products they place on the market; - Ensure that measures support sustainable economic models; - Harness reach and influence of all sectors; - Support clear and robust institutional arrangements for the waste sector.	Circular economy
Ireland	2019 Coastal protection strategy study	Unsure on which phase	National study that was commissioned in 2003, can completed in 2013, with the objective of providing information to support decision making about how best to manage risks associated with coastal flooding and coastal erosion.	The prediction of extreme water levels and the assessment of both coastal flood and erosion hazard is a key element in the development of any coastal protection strategy. - Establishment of extreme coastal flood extent maps for the coastline of Ireland; - Coastal flood extent and flood depth maps.	Marine and coastal environment
	2018 Focus on Marine & Maritime		Presents summary data on the state of the sector, challenges and opportunities. Overview of policies concerning the Irish Blue Economy.	Value of ocean economy in Ireland is growing at a faster pace than the general economy. Key figures: - Value to the economy of €3.71 billion; - Aim to double its value to 2.4% of GDP by 2030; - Irish blue economy employs 30 000-40 000 people directly; - Ocean economy emerging sectors: offshore renewables, high tech marine products and	Marine and coastal environment

				services/ICT for the sea & marine biotechnology, maritime commerce. Challenges: - Rapid changing regulation and governance and growing pressures on the resource and ocean space; - Climate change; - Environmental issues and climate targets (energy and CO2, sustainability); - Public perception; - Increase of global investment in aquaculture.	
Ireland	National planning framework: Project Ireland 2040	2018-2040	Sets out Ireland's national planning framework for managing a growing population and economy	The main areas this framework targets are: - Regional policies aimed at Ireland's three regions - Specific policies for Ireland's capital Dublin - Policies aimed at growing Ireland's other cities i.e. Cork, Limerick, Galway, and Waterford - Reversing town/village depopulation and other strategies aimed at Ireland's rural fabric - Compact growth policies	Territorial strategies/co operation

Norway	Priority research needs of the Ministry of Climate and Environment	2016-2025	Describes priority knowledge needs, based on the input from the Norwegian Environment Agency, the Directorate for Cultural Heritage, the Norwegian Polar Institute and the Norwegian Radiation Protection Authority.	Main environmental problems: - Climate change; - Loss of biodiversity; - Spread of pollutants. Research priorities considered in conjunction with broader industrial policy goals: - Shipping; - Aquaculture; - Process industries; - Hydropower; - Seas and oceans; - Climate, environment and clean energy. Key research needs: - Natural and cultural heritage; - Climate change (e.g. in the Arctic/polar regions); - Ecosystem-based management; - Sustainable land use; - Sustainable towns and urban areas; - Sustainable production and consumption; - Governance and management; - Cross-cutting instruments.	Energy and climate change
	Fourth biennial report	2018-2020	Prepared in accordance with UNFCCC biennial reporting guidelines for developed country parties. Focuses on progress towards 2020 target, and includes projections up to 2030.	In 2017, total GHG emissions were 52.7 million tonnes of carbon dioxide equivalents. Climate targets: - Reduce emissions by 30% by 2020; - Reduce emissions by at least 50% by 2030; - Climate neutrality by 2030; - Low-emission society by 2050. Examples of relevant cross-sectoral policies and measures: - Pollution Control Act; - Norwegian Energy Fund, Enova; - Klimasats; - Environment Technology Scheme;	Energy and climate change

				- Nysnø Klimainvesteringer AS; - Co2 tax and Greenhouse Gas Emission Trading Act; - NMVOC regulation.	
Norway	Follow-up on Agenda 2030 and Sustainable Development goals	2016-2030	Summary of key features of Norway's initial national follow-up and review of the 2030 Agenda.	Challenges that have been identified at the national level include: - Ensuring sustainable infrastructure; - Improving urban air quality; - Halving food waste and reducing waste generation; - Reducing the impact of invasive alien species. Norway committed to reducing emissions by at least 40% by 2030 (1990 levels).	Energy and climate change
	Strategy for green competitiveness		Sets priorities and includes roadmaps for green competitiveness.	Focuses particularly on certain priorities for promoting green competitiveness: - Markets for green solutions; - Green and innovative public procurement; - Research, innovation and technology development; - Infrastructure for green solutions; - Managing climate-related risks and financing; - A circular economy; - Increasing exports of green solutions; - Continued dialogue and cooperation with the business sector.	Energy and climate change
	2019 Attractive Nordic towns strategies towards a more sustainable future		Guide to those who aim at building attractive small and medium-sized Nordic towns.	Focus on SDG implementation and participatory process. Considers five dimensions: - Spatial dimension strategies; - Governance dimension strategies; - Social dimension strategies; - Economic dimension strategies; - Environmental dimension strategies. In the latter, namely climate change mitigation, protection, restoration and enhancement of biodiversity and ecosystems, pollution reduction, managing natural	Energy and climate change

				resources sustainability and preventing waste, protection, preservation and management of water resources, adaptation to climate change.	
Norway	White paper on climate strategy for 2030	2017-2030	Description of context and rationale for climate strategy. Recommendation of 16 June 2017 from the Ministry of Climate and Environment.	Attempts to meet the 2030 emissions target with reduction of domestic emissions, especially, and through the use of EU flexibility mechanisms. Climate targets: - Will reduce global greenhouse gas emissions by the equivalent of 30% of its own 1990 emissions by 2020; - Norway has conditionally undertaken a commitment to reduce its emissions by at least 40% by 2030 compared with the 1990 level; - Climate neutral by 2030; - Norway has adopted a legally binding target of being a low-emission society by 2050; - As a political goal, Norwegian society will prepare for and adapt to climate change.	Energy and climate change
	2014-2015 White paper on Emission commitment for 2030	2014-2030	Describes policy instruments and gives a general description of sectors where there is expected to be a potential for emission reductions.	Norway's climate policy based on the agreements on climate policy adopted by most of the parties in the Storting in 2008 and 2012. Current policy instruments: - Taxes and participation in the EU emissions trading system (ETS); - Enova state-owned enterprise administering important instruments (e.g. grant scheme); - Increasing the use of bioresources to replace fossil fuels. Priority areas: - Reduction of emissions from the transport sector; - Development of low-emission industrial technology and clean production technology; - Carbon capture and storage;	Energy and climate change

				- Strengthening Norway's role as a supplier of renewable energy; - Environmentally sound shipping.	
Norway	2012-2013 White paper on climate change adaptation		Sets out policy based on the premise that climate is already changing. Provides general account of implications of climate change for Norwegian society. Sets out framework to facilitate adaptation.	Major consequences in the Arctic for population and communities with rising temperatures. Key considerations in climate change adaptation: - Time horizon; - Assessments of impacts of climate change to be based on figures from high end of range of national climate projections; - Cost-benefit analyses.	Energy and climate change
	2015-2016 White paper on national biodiversity action plan		Explores current challenges regarding biodiversity and defines priorities, tools and instruments.	Government policy for biodiversity: - More clearly targeted nature management - Climate-resilient nature management - Strengthening municipal expertise on biodiversity - Safeguarding threatened species and habitats - Long-term conservation of a representative selection of Norwegian nature - Knowledge-based management - Adaptation of tools and instruments to the different ecosystems National biodiversity targets: - Achieving good ecological status in ecosystems; - Safeguarding threatened species and habitats; - Maintaining a representative selection of Norwegian nature (the conservation of areas covering the whole range of habitats and ecosystems).	Energy and climate change
	2018 Report on climate risk and		Details climate related risks for Norway, future scenarios and	An overall assessment of key risk factors indicates the Norwegian economy is relatively resilient in a scenario with moderate climate change.	Energy and climate change

	the Norwegian economy		framework for national reporting.		
Norway	Hydrogen strategy	2020-2030	Lays foundation for the government's future work with hydrogen.	Ideal conditions for hydrogen use in Norway.	Energy and climate change
	Ocean strategy		Promotes further development of the ocean industries and strengthens ocean management.	Three main policy areas: - Climate change; - Regional focus of the ocean policy; - National value and local value creation. Ocean industries employ more than 206 000 people.	Marine and coastal environment
	Government's action plan for green shipping		Presents the Government's policy for cutting domestic greenhouse gas emissions, strengthening the maritime industry and playing a part in global technological developments needed to achieve Paris Agreement targets.	Green shipping programme as a PPP established in 2015 on DNV GL's initiative. The Government will: - Maintain Enova's position as an important funding agency for the transition to zero- and low-emission technology; - In the forthcoming action plan for green public procurement and green innovation, consider how requirements relating to zero-emission transport can be included in public procurement processes whenever feasible; - Consider the introduction of a biofuel quota obligation for advanced biodiesel and biogas for shipping; - Increase the carbon tax rate by 5 % per year from 2020 to 2025; - Continue to support the Green Shipping Programme and maintain close dialogue with business and industry in order to create green, competitive employment within Norway's maritime clusters.	Marine and coastal environment

Norway	2012-2013 White paper on Integrated management plan of the marine environment of the North Sea and Skagerrak		Presents the framework used by the government for the sustainable use of natural resources and ecosystem services derived from the North Sea and Skagerrak. This ensures that the structure, function, productivity, and diversity of the area's ecosystem is maintained.	Sets out goals for management of the North Sea and Skagerrak reflecting relevant national and international goals for the environment and value creation.	Marine and coastal environment
	2016-2017 Integrated management plan for the Norwegian Sea		Presents updates to the original management plan for the North Sea (08-09)	This update focuses particularly on topics where new knowledge indicates that new or updated management measures are needed, particularly due to: - The impacts of climate change and ocean acidification - Overfishing of certain fish stocks, - The risk of acute pollution - The decline of seabird populations - The need to protect coral habitats.	Marine and coastal environment
	2017 Arctic strategy		Presents updates to the previous Arctic strategy white paper	The objectives of this strategy are: - Peace, stability, and predictability - Integrated, ecosystem-based management - International cooperation and the international legal order - A stronger basis for employment, value creation, and welfare This is integrated with the context of Norway's regional policy.	Arctic

Norway	White paper on the High North (expected in late 2020)		Norway's Arctic policy revolves around security, stability, and interest based international cooperation.	The overarching goals of the government's policy in the arctic are: - Peace, stability and predictability - International cooperation and the international legal order - Integrated, ecosystem-based management system - Increased job creation and value creation - Closer cooperation between the business sector and knowledge institutions - Effective welfare schemes and ensuring that North Norway is an attractive place to live	Arctic
Sweden	Strategy for Sweden's global development cooperation in environmental sustainability, sustainable climate and oceans, and sustainable use of natural resources	2018-2022	Sets out the direction, context, and operations of Sweden's strategy for global development cooperation in environmental sustainability, sustainable climate and oceans, and sustainable use of natural resources	The main focuses of this strategy are: - Climate-resilient sustainable development - Environmentally sustainable development and sustainable use of natural resources - Sustainable oceans and water resources	Energy and climate change
	2020 Integrated National energy & climate plan		This paper elaborates on Sweden's existing energy and climate goals, policies, and measures and on the associated scenarios.	Overall, Swedish energy and climate policy is compatible with the goals of the five dimensions set out by the Energy Union. It is based on the same three pillars as energy cooperation in the EU and aims to combine ecological sustainability, competitiveness and security of supply.	Energy and climate change
	2020 Circular economy	2020-2030	Summarises action plan for achieving	Vision: A society in which resources are used efficiently in non-toxic circular flows, replacing virgin materials	Circular economy

	strategy for the transition		circular economy targets	Overall objective: The transition to a circular economy shall contribute to achieve the environmental and climate objectives, as well as the Sustainable Development Goals in the 2030 Agenda.	
Sweden	2015 Maritime Strategy		This sets out the strategy for socially, environmentally, and economically sustainable development in the form of a policy document.	The plan for socially, environmentally, and economically sustainable development rests on three equal pillars: - A balanced marine environment - Competitive maritime industries - Attractive coastal areas	Marine and coastal environment
	2020 Arctic strategy		Sets out the renewed Swedish Strategy for engagement in the Arctic	This strategy is focused on six thematic areas: - International collaboration - Security and stability - Climate and the Environment - Polar Research and environmental monitoring - Sustainable economic development and business interests - Securing good living conditions	Arctic
Other territories					

Canada	2019 Arctic and Northern Policy Framework		Sets out Framework for creating a thriving, strong, and safe society for Northern and Arctic people	The framework highlights clear priorities and actions set out by the federal government and its partners to: - Nurture healthy families and communities; - Invest in the energy, transportation, and communications infrastructure that northern and Arctic governments, economies, and communities need; - Create jobs, foster innovation, and grow arctic and northern economies; - Support science, knowledge, and research that is meaningful for communities and for decision-making - Face the effects of climate change and support healthy ecosystems in the Arctic and North; - Ensure that Canada and our Northern and Arctic residents are safe, secure, and well-defended; - Restore Canada's place as an international Arctic leader; - Advance reconciliation and improve relationships between Indigenous and non-Indigenous peoples.	Arctic
Russia	2013 Arctic strategy		Revised and updated the 2008 strategy. Covers only the RAZ rather than the whole Arctic region, although it has some international cooperation. It aims to provide a high-tech assistance to develop its Far North.	- International cooperation in areas such as the exploration and exploitation of natural resources, environmental protection, preservation of indigenous people's traditional economy and culture, etc.; - It introduces the idea of making the RAZ a separate federal entity with its own monitoring system (though does not clearly define geographical area); - Envisions an important role for regional and local governments as well as private business in Arctic projects; - Establishes set of priorities for Russian environmental policies in the RAZ and pledges financial contribution; - Introduces an indicator system of monitoring socioeconomic and security developments in the RAZ.	Arctic

Russia	Basic principles of the Russian Federation state policy in the Arctic	2035	Strategic planning document aimed at ensuring national security and drafted to protect the country's national interests in the Arctic.	- Stimulate economic development and create new high-paying jobs in the Arctic for Russian citizens; - Intensification of research and development of the Arctic shelf; - Active development of mineral resource centres, freight traffic, along the Northern Sea Route; - Development of other infrastructure in the Arctic zone, in particular rail lines, and with special focus on rivers; - Prepare a separate programme for the development of fundamental and applied research in the interests of the development of the Arctic; - Launch of several small, medium and large-scale projects in the Arctic, creating 200,000 jobs for Russian citizens; - Improve quality of life in the Arctic zone of Russia; - Launch a program of state support for indigenous peoples' economic projects; - Develop network of protected natural areas; - Prioritise cooperation and dialogue in the Arctic, namely through the Arctic Council.	Arctic
United Kingdom	2018 Policy towards the Arctic		The second iteration of The UK's Arctic policy originally set out in 2013. Provides update on what has been achieved since the original as well as future plans.	UK Policy Towards the Arctic focuses on UK actions and priorities across three key areas: - Protecting global influence - Protecting people and the environment - Promoting the Arctic as a place where economic and commercial development occurs in a sustainable and responsible manner.	Arctic
	2019 Scottish government Arctic policy mapping report		A detailed overview of Scotland's existing links with the Arctic region from governance, socio-	The following recommendations were made in the report: - Drawing synergies with other sub-national regions located in the Arctic; - Increasing Scottish presence through international bodies;	Arctic

			cultural, economic, environmental, and climate change perspectives.	- Pushing an Arctic identity for Scotland; - Understanding and protecting the needs of rural and remote communities; - Seek out opportunities in oil and gas exploration, renewable energy, fisheries, and tourism presented by Arctic; - New innovations in multi-disciplinary research – The Scottish Arctic research cluster; - Distance learning educational models; - Investing in advances in technical innovation; - Consolidation of Arctic Research in Scotland; - Fostering educational links.	
EU	2016 Integrated EU policy for the Arctic		This Joint communication sets out the case for an EU policy that focuses on advancing international cooperation in responding to the impacts of climate change on the Arctic's fragile environment, and on promoting and contributing to sustainable development, particularly in the European part of the Arctic.	Response is focused in three priority areas: - Climate change and safeguarding the Arctic; - Environment; - Sustainable Development in and around the Arctic; - International Cooperation on Arctic Issues; The EU should attach particular importance to research, science and innovation which will play a key role across all three priority areas.	Arctic

7.2.1 ANNEX 3 – ENVIRONMENTAL INDICATORS

Indicator		Source	Unit	Year	Definition	SE	FI	NO	GL	FO	IS	IE
PO2 - A GREENER, LOW-CARBON EUROPE BY PROMOTING CLEAN AND FAIR ENERGY TRANSITION, GREEN AND BLUE INVESTMENT, THE CIRCULAR ECONOMY, CLIMATE ADAPTATION AND RISK PREVENTION AND MANAGEMENT												
b.) The promotion of community-based renewable energy generation solutions	Share of energy for final consumption from renewable sources by reporting country, energy indicator and time	Nordic statistics database	%	2019	(% of renewable energy in gross final consumption, % of renewable energy in transport/ electricity/ heating and cooling)	x	x	x	X (until 2015)		x	
	Share of renewable energy in gross final energy consumption	Eurostat	%	2019		x	x	x			x	x
c.) Facilitating the transfer and development of smart energy management concepts, joint knowledge development of grids and energy storage solutions that facilitate the use of place-based energy surpluses in remote communities	Gross inland energy consumption by reporting country, product, unit and time	Nordic statistics database	Thousand tons of oil equivalent, TJ	2019	(total, solid fuels, total-petroleum products, gas, nuclear heat, derived heat, renewable energy, electrical energy, non-renewable waste)	x	x	x			x	
	Final energy consumption	Eurostat	Million tons of oil equivalent	2018	The indicator only covers the energy consumed by end users, such as industry, transport, households, services and agriculture; it excludes energy consumption of the energy sector itself and losses occurring during transformation and distribution of energy and all non-energy use of energy carriers (e.g. natural gas used	x	x	x			x	x

	Indicator	Source	Unit	Year	Definition	SE	FI	NO	GL	FO	IS	IE
					not for combustion but for producing chemicals).							
d.) Joint planning, knowledge development, monitoring, forecasts, joint management of climate change adaptation, risk prevention and disaster resilience in remote, and sparsely-populated communities.	Greenhouse gases, national emissions in 1000 tonnes CO_2 equivalents by reporting country, sector and time	Nordic statistics database	Thousand tons of CO2 equivalents	2018	(All sectors and indirect CO2 excluding LULUCF and memo items including aviation, energy sector, industrial processes and product use, agricultural sector, waste management sector, other sectors)	x	x	x	X (until 2016)		x	
e.) Transfer and development of solutions that facilitate the use of community knowledge in climate change adaptation, risk prevention and disaster resilience	Greenhouse gas emissions	Eurostat/EEA	Tonnes per capita; tons of CO2 equivalent	2018		x	x					
	Economic damage caused by weather and climate-related extreme events in Europe (1980-2019)	Eurostat	Million EUR	1980-2019	EU aggregated							
f.) Facilitating the transfer and development of	Development in municipal waste generation and	Nordic statistics database	Kg/capita, % of total	2019	(Material recycling, Composting and digestion, Total waste treated)	x	x	x	x (until		x (until	

	Indicator	Source	Unit	Year	Definition	SE	FI	NO	GL	FO	IS	IE
solutions that promote resource efficiency, end-of-waste and a better use of by-products in remote and sparsely-populated communities	treatment by reporting country, unit, treatment and time		waste generated						2018)		2017)	
	Municipal waste by waste management operations	Eurostat	KG/capita; thousand tons	2018/2019	Amount of municipal waste generated and treated per year. The bulk of the waste stream originates from households; similar wastes from sources such as commerce, offices and public institutions are also included.(Waste generated, waste treatment, Disposal - incineration (D10) and recovery - energy recovery (R1), Disposal - landfill and other, Disposal incineration, Recovery - energy recovery, Recycling – material, Recycling - composting and digestion)	x	x					X
Facilitating the transfer and development of solutions for community planning for the circular economy in remote and sparsely-populated communities	Material flow accounts by material, reporting country, unit, indicator and time	Nordic statistics database	Thousand tons, kg per EUR GDP	2019	(biomass, metal ores, non-metallic minerals, fossil energy materials or carriers, other products, waste for final treatment and disposal)	x	x	x			x	X
	Circular material use rate	Eurostat			The share of material recovered and fed back into the economy - thus saving extraction of primary raw materials - in overall material use. The circular use of materials is approximated by the amount of waste recycled in domestic recovery	x	x					X

	Indicator	Source	Unit	Year	Definition	SE	FI	NO	GL	FO	IS	IE
					plants (RCV_R), minus imported waste destined for recovery (IMPw), plus exported waste destined for recovery abroad (EXPw).							
	Domestic material consumption	Eurostat	Tonnes per capita	2019	Total amount of material directly used in an economy and equals direct material input (DMI) minus exports. DMI measures the direct input of materials for the use in the economy. DMI equals domestic extraction (DE) plus imports. For the 'per capita' calculation of the indicator the average population is used (the arithmetic mean of the population on 1st January of two consecutive years). EW-MFA covers all solid, gaseous, and liquid materials, except water and air. Water included in products is included.	x	x	x			x	X
	Resource productivity and domestic material consumption	Eurostat	percent	2019	Gross domestic product (GDP) divided by domestic material consumption (DMC). DMC measures the total amount of materials directly used by an economy. It is defined as the annual quantity of raw materials extracted from the domestic territory of the focal economy, plus all physical imports minus all physical exports. It is important to note that the term 'consumption', as used in DMC,	x	x	x			x	X

	Indicator	Source	Unit	Year	Definition	SE	FI	NO	GL	FO	IS	IE
					denotes apparent consumption and not final consumption. DMC does not include upstream flows related to imports and exports of raw materials and products originating outside of the focal economy. As nominator for the calculation of resource productivity, Eurostat uses GDP in unit 'EUR in chain-linked volumes' (to the reference year 2010 at 2010 exchange rates) and in unit 'PPS' (Purchasing Power Standard). Consequently, the indicator is expressed: i) in euro (chain linked volumes) per kg, for comparing the changes in one country over time; ii) in PPS per kg, for comparing different countries in one specific year. Based on GDP in chain linked volumes, resource efficiency is also calculated as an index on year 2000, for comparing countries in different years.							
ISO1 - A BETTER COOPERATION GOVERNANCE												
Development and transfer of concepts and models for the protection, promotion and	Viable ecosystems	Nordic statistics database			Composite indicator: Common farmland bird index by reporting country and time, Sustainable yield of fish stocks by area, stock, threshold and time, Forest fellings and	x	x	x				

	Indicator	Source	Unit	Year	Definition	SE	FI	NO	GL	FO	IS	IE
development of the natural and cultural heritage in Arctic and near-Arctic regions.					increment by reporting country, content and time							
		Eurostat (EEA; EBCC, STECF)			Forest: growing stock, increment and fellings (EEA_SEBI017), Common bird index by type of species (e.g. farmland species) - European Bird Census Council; Assessed fish stocks exceeding fishing mortality at maximum sustainable yield (FMSY) in North East Atlantic (source: JRC, STECF)	x	x					X
	Decoupling environmental pressure from economic development by indicator, reporting country, unit and time	Nordic statistics database		2018/ 2019 (depending on indicator)	Composite indicator: Total GHG emissions, emissions of NOx, SOx, NH3, energy consumption, domestic material consumption, non-material waste, GDP/constant prices in million EUR)	x	x	x	(x)		x	(x)