



SUMMARY

Arctic energy needs are driven by global economic trends, climate change, advances in technology, and regional development requirements. There is potential for closer regional energy collaboration in areas such as community microgeneration, mainstreaming energy efficient construction practices and promoting energy-efficient technologies. There will also be a need to adapt and respond to large scale changes - particularly more intensive hydrocarbon resource extraction. Though territorial cooperation programmes do not aim to directly influence large scale generation, they are a mechanism for addressing the regional and local dimensions of associated challenges.

OVERVIEW

The Arctic region has substantial renewable energy generation potential and hydrocarbon reserves.

Estimates indicate that 13% of global undiscovered oil and 30% of undiscovered natural gas is located in the Arctic, much of it in offshore areas.¹ Reduced sea ice and advances in technology have made it more feasible to develop these reserves. There are concurrent incentives to promote renewable energy generation at the regional level. Energy resource efficiency is an important consideration in the context of climate change and rising global oil costs. This discussion paper relates to:

- *Energy generation*²: through 'conventional' hydrocarbon resources including oil, coal and gas (including shale gas); sustainable renewable resources (hydro, wind, biomass, tidal, solar photovoltaic (PV), wave and geothermal, the latter in a limited number of regions only); and nuclear sources (currently only in two Arctic regions – Chukotka and Murmansk, Russian Federation).
- *Energy efficiency*: the efficient use of energy through low carbon technology and sustainable use, including the conservation of thermal energy. This is extremely important factor in the Arctic environment and plays a role in many aspects of Arctic life. There is already well developed regionally situated knowledge in this field, which has the potential to be transferred to other Arctic and near-Arctic regions.

Arctic and near-Arctic regions are home to clusters of localised expertise. Regional clusters often specialise in particular energy sources, and cover both conventional and renewable generation. For example, there is a well-established wind power cluster in the Central Denmark Region (Midtjylland); there is oil and gas expertise in Aberdeen (Scotland), Stavanger (Norway), and Alberta (Canada); and industry concentration in geothermal power generation in Iceland. Expertise in efficiency mechanisms is arguably more dispersed.

Drivers of energy and resource efficiency

Sustainable energy exploitation and resource efficiency in the Arctic is driven by both 'push' and 'pull' factors. Push factors include increasing global oil costs contingent with peak oil scenarios; long-distance hydrocarbon transport costs; and the costs and environmental impacts of energy infrastructure such as pipelines and pylons. 'Pull' factors (incentives) relate to the strategic, economic and environmental advantages of energy security and affordability in the context of regional development.

¹ US Geological Survey (2008) Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle (online). Available at: <http://pubs.usgs.gov/fs/2008/3049/fs2008-3049.pdf>

² Cooperation programmes do not aim to directly influence large scale generation activities (as noted in the Summary).

TERRITORIAL COOPERATION

European Territorial Cooperation transnational programmes will continue to address energy and resource efficiency issues in the forthcoming 2014-2020 funding period:

- Arctic-relevant *INTERREG VB transnational programmes* with energy and/or resource efficiency priorities will include the Northern Periphery and Arctic Programme. The North Sea Region Programme will address green energy issues through its eco-innovation priority.³
- Current indications are that Arctic-relevant *INTERREG VA cross-border programmes* will not focus on energy at the priority level, but there will be crossover with innovation and environment objectives. For example, the Nord 2014-2020 programme recognises the potential for energy and environmental technology development under its commitment to enhancing the competitiveness of SMEs.⁴

European Territorial Cooperation projects already focus on multiple aspects of energy production and efficiency. Examples include developing energy policy, supporting renewable energy supply chains, and investigating products which promote energy efficiency. INTERREG programmes have a strong role in promoting innovation in this field, through supporting new technology and best practice applications and solutions. Programmes supported by the European Neighbourhood and Partnership Instrument (ENPI) have also targeted energy issues in the 2007-2013 period. For example, the ENPI Karelia's Priority 1 addresses energy efficient solutions in community planning and building, as well as the use of local bio-energy sources.

The North Sea Region Programme (NSRP) and energy efficiency projects

In the 2007-2013 EU funding period the NSRP delivered projects promoting energy efficiency. These included A North Sea Way to Energy-Efficient Regions (ANSWER), which aimed to contribute to the 2007 Energy Policy for Europe targets through a focus on business and communities, and Low Carbon regions in the North Sea (LOWCAP), a cluster established to facilitate knowledge exchange relating to energy efficiency and carbon emissions reduction.

Non-EU led territorial cooperation initiatives are also active. Many are thematically focussed, such as the Nordic Energy Research platform under the Nordic Council of Ministers. The Sustainable Development Working Group (SDWG) of the Arctic Council has previously reported on Arctic energy. The Barents Euro-Arctic Council also has a Joint Working Group on Energy. Other international networks, such as the Arctic Energy Network, facilitate communities of interest in this thematic area.⁵

Cooperation in this thematic area can be challenging, but there is scope for positive regional action.

Arctic regions have broadly homogenous energy needs and there is much scope for dialogue and action at the sub-national level. For example, the Arctic region has strong potential for community-level renewable energy solutions. This is an area which is currently being developed through the ENPI Kolarctic POLARIS project, which aims to reduce the energy dependency of peripheral regions on core regions (due for completion in 2014).

Arctic actors are continuing to develop research capacity and legislative commitment in this thematic area. For example, Nordic Energy Research is currently organising national workshops in the five Nordic Council countries, with a view to finalising its 2015-2018 research strategy. The Arctic EU Member States are also bound to the renewable energy generation and efficiency targets specified in the Europe 2020 strategy.

³ Based on current information which may be subject to change. Some programmes, such as the Atlantic Area 2014-2020 INTERREG VB Programme, do not yet have publicly available draft priorities.

⁴ Nord (2013) Utkast av Interreg Nord-programmet 2014-2020 (2013-10-11).

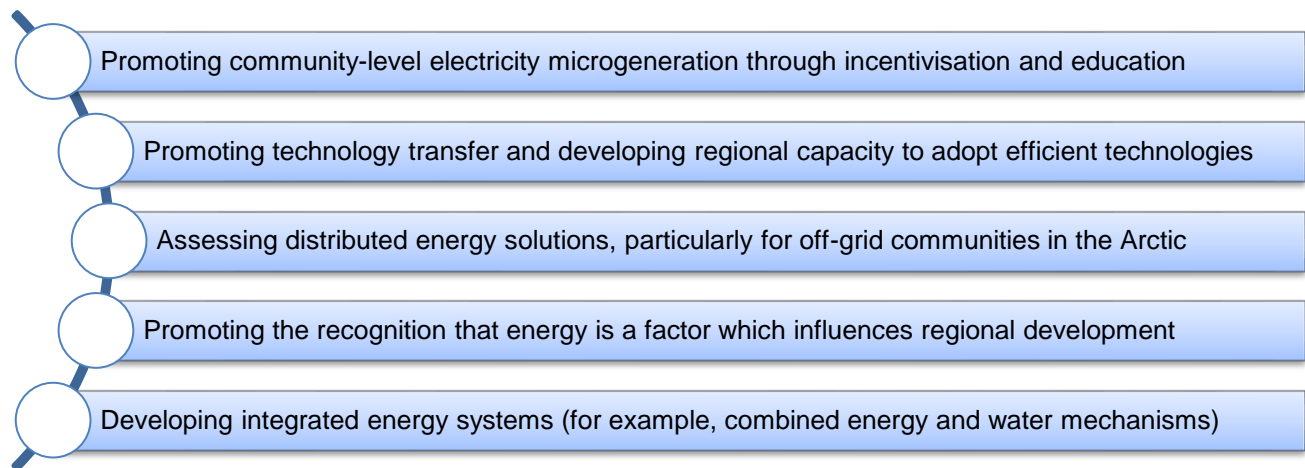
⁵ Arctic Energy Network (online). Available at: <http://arcticenergysummit.institutenorth.org/arctic-energy-network/>

FUTURE POTENTIAL FOR COOPERATIVE ACTION

There is potential to develop innovative Arctic energy efficiency solutions. There are already well established eco-innovation strengths in some Arctic regions (for example, cleantech and energy in the Tampere region, Finland). Territorial cooperation can support new and innovative efficiency solutions through the pooling of knowledge and R&D resources. The uptake of innovative energy efficiency solutions is also important –energy efficiency mechanisms can be mainstreamed through cooperative agreements.

Territorial cooperation programmes can support ‘niche’⁶ alternative energy source development. For example, though solar photovoltaic energy is not widely used in the Arctic, high latitude regions can receive significant amounts of sunlight and this particular source has strong future growth potential. Nordic Energy Research has already supported a collaborative research and feasibility study relating to solar PV through the project ‘Solar Power Plants in the North’.⁷ Other niche generation sources include biomass, micro-scale wind turbines and Combined Heat and Power systems. Many are well suited to community-level use in the Arctic.

Specific areas for future potential action include:



Distributed generation solutions⁸ are more relevant in the Arctic region. Arctic communities which are not connected to regional electricity grids may rely upon distributed generation (i.e. the production of electricity from numerous microgeneration sources). Renewable sources have development potential in this context. Community-based energy generation can also contribute to regional economic development, and can have associated social and political benefits, such as strengthening local engagement and social capital.

This theme is likely to grow in strategic importance over coming years. This is reflected by ongoing political activity and cooperative agreements. Recent examples include:

- The European Commission’s (September 2013) adoption of a report on the implementation of the September 2011 Communication on security of energy supply and international cooperation.⁹
- Agreement of the ‘EU-Russia Energy Cooperation until 2050’ roadmap (March 2013), which notes that EU-Russia cooperation on renewables is underdeveloped, but that closer cooperation could be mutually beneficial.¹⁰

⁶ Scalable generation sources which are not currently mainstreamed, and in which technology is rapidly evolving.

⁷ <http://www.nordicenergy.org/project/solar-power-plants-in-the-north/>

⁸ The generation of energy through multiple smaller sources as opposed to few large-scale centralised sources.

⁹ Report from the Commission to the European Parliament, the Council and the European Economic and Social Committee; Implementation of the Communication on Security of Energy Supply and International Cooperation and of the Energy Council Conclusions of November 2011, COM/2013/0638 final

KEY QUESTIONS FOR DISCUSSION

- **From a regional perspective, what are the most pressing energy generation and energy resource efficiency challenges facing the Arctic?**
 - How does energy supply and reliability affect regional development in the Arctic and near-Arctic?
 - How can regions seek to diversify their energy mix, particularly by developing renewable energy sources?
- **How can territorial cooperation in general contribute towards addressing these challenges?**
 - How can territorial cooperation programmes address both energy generation and energy efficiency? Energy production and energy consumption are closely related issues and it is advantageous to consider them jointly (for example, through smart grid technology).
 - How can territorial cooperation programmes tap into clusters/concentrations of scientific and industrial expertise across the Arctic and the near-Arctic?
- **How could a more collaborative approach between programmes, regional councils and other stakeholders (ARC-NET) address these issues in specific ways?**
 - How can territorial cooperation programmes engage with policymakers across the Arctic to ensure the dissemination of policy-relevant outputs? (For example, the North Sea Region Programme 'Build with CaRe' (BwC) project outputs regarding energy efficient buildings).¹¹
 - Is there scope to engage with or utilise relevant existing networks, such as University of the Arctic thematic networks or the Arctic Council Working Groups?
 - How can synergies between INTERREG, ENI and other territorial cooperation programmes be developed to improve the delivery of direct outputs and results in the field of energy generation and efficiency?
 - How can territorial cooperation ensure that remote and peripheral Arctic and near-Arctic communities are able to pursue distributed generation solutions?
 - How can territorial cooperation programmes achieve broader public engagement, and seek to promote influence consumer behaviour in the interests of energy efficiency?
 - How can the anticipated future energy development opportunities, such as Arctic offshore hydrocarbon extraction, be managed through territorial cooperation?

¹⁰ (March 2013) Roadmap; EU-Russia Energy Cooperation until 2050

¹¹ North Sea Region Programme (2014) BwC; Build with CaRe - Mainstreaming Energy efficiency in the built environment (online). Available at: <http://www.northsearegion.eu/ivb/projects/details/&tid=74>