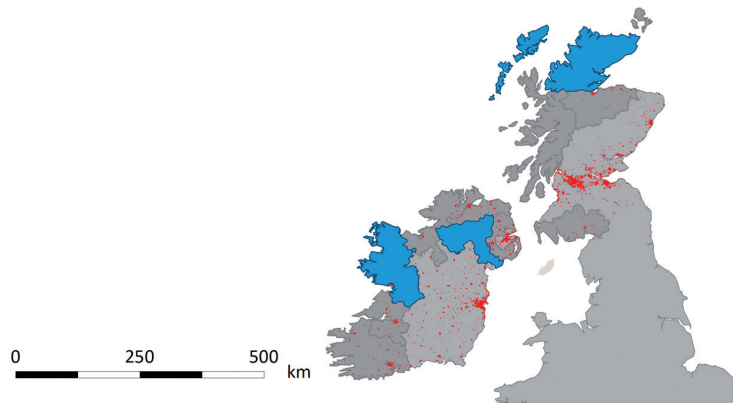
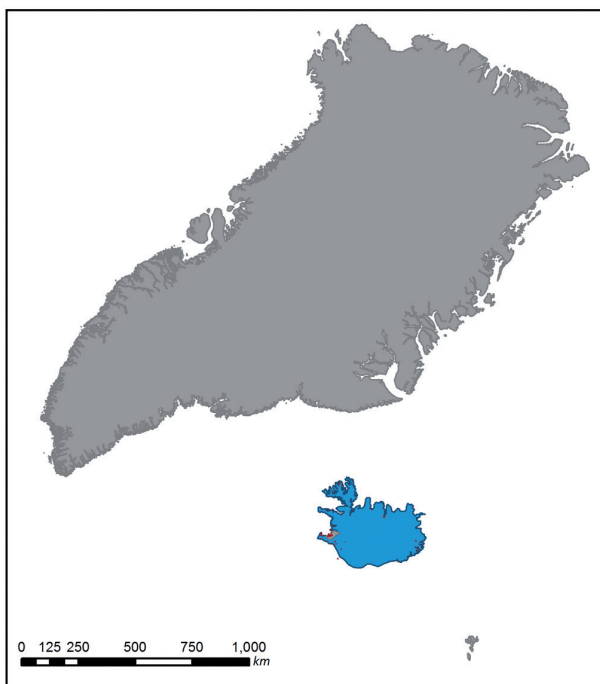




# Result Indicator Baselines and Targets

of the Northern Periphery and Arctic Programme 2014 - 2020

Summary report



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# 1. Introduction

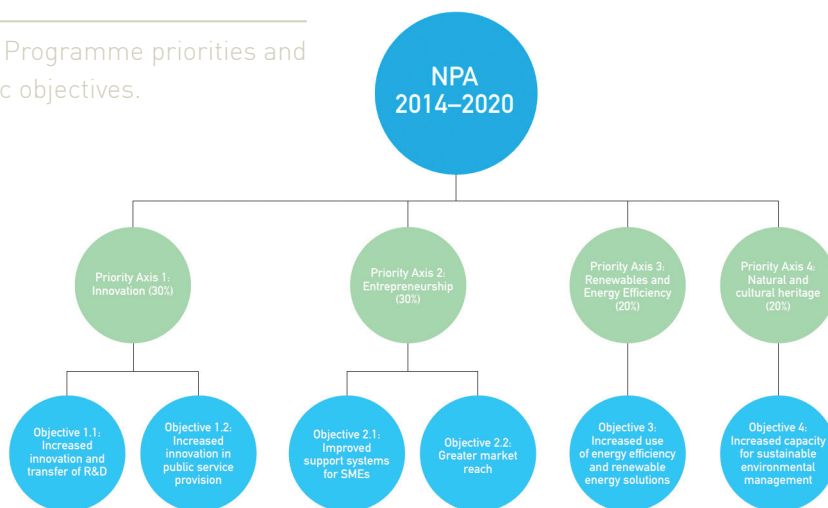
## 1.1 Objective

The Northern Periphery and Arctic Programme 2014 – 2020 covers the northernmost regions of Europe and is jointly implemented by eight countries: Finland, Sweden, Norway, Ireland, the United Kingdom (Scotland and Northern Ireland), the Faroe Islands, Iceland and Greenland. All regions represented in the programme are characterised by their location at the periphery, low population density, unfavourable demographic development due to outmigration and an aging population, and by a cold climate. On the flip side, the programme area boasts an abundance of natural resources and natural and cultural heritage. To encourage collaboration on developing solutions to the common challenges and the sustainable management of joint resources, the Programme funds cooperation projects between public and private organisations from different regions within the programme area in four

priority areas: Innovation, entrepreneurship, energy efficiency and sustainable environmental management.

Priorities translate into six specific objectives. For each specific objective, the Programme is expected to demonstrate that the projects funded have a direct, positive and measurable impact in the programme territory. To maximise the impact of the total of funding available for project interventions in the coming seven years, the programme decided to put an emphasis on the remote and sparsely populated areas of the programme area, outside the national and regional centres. These regions lack consistent and timely statistical data, and thus the monitoring of programme results calls for an alternative approach, which will be described in detail in this technical report.

Fig. 1: Programme priorities and specific objectives.



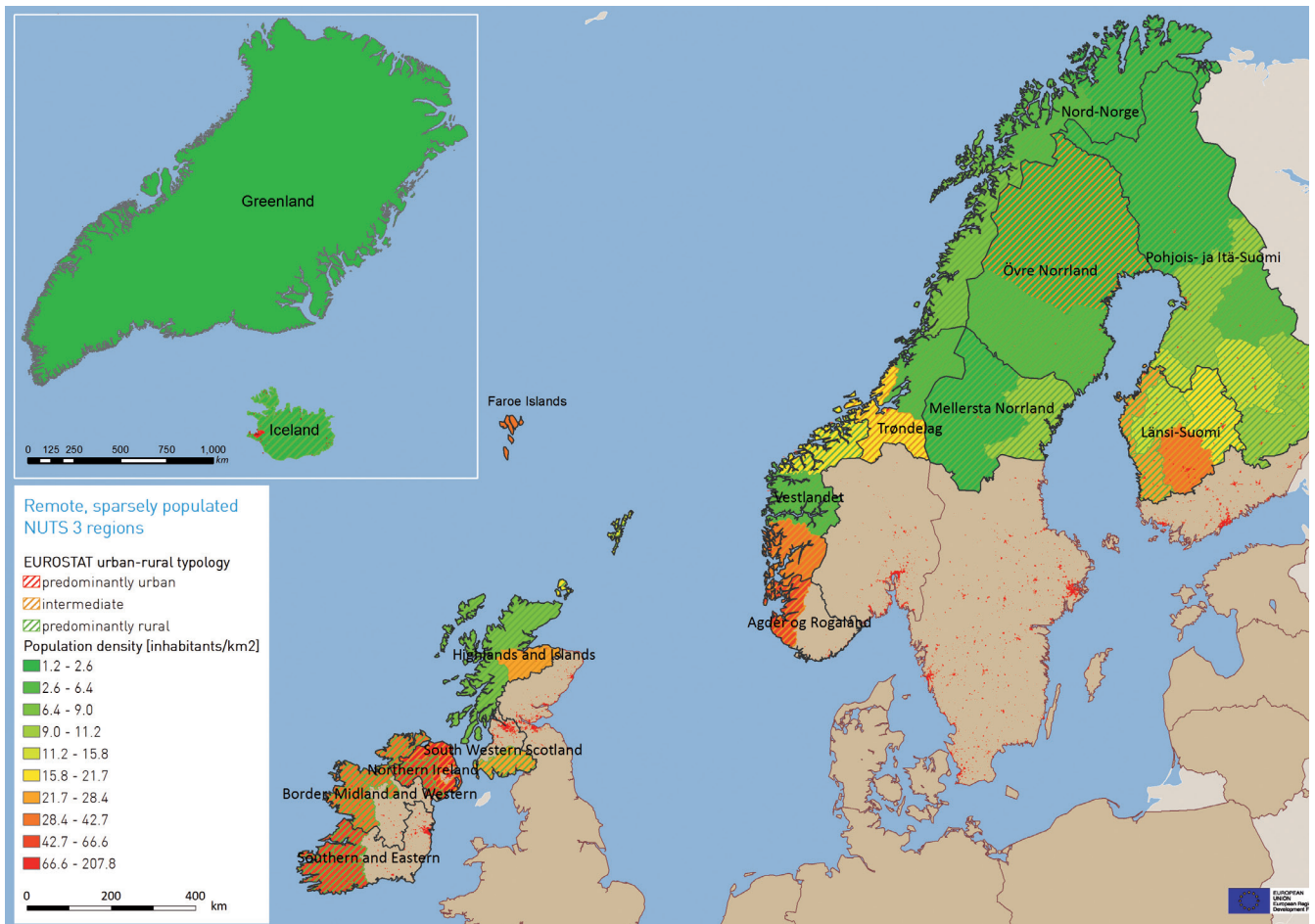
## 1.2 Method

Programme results monitoring has become the centrepiece of the evaluation framework for the 2014 – 2020 programming period. In order to monitor progress towards its objectives, the Northern Periphery and Arctic Programme has to define, for each of the six programme objectives, result indicators ('how to measure the achievement of our objectives'), establish baseline values ('where do we stand now') and targets ('where do we want to be in 2017, 2019 and 2023'). 'Tentative' indicators were defined in the Cooperation Programme and approved by the European Commission. They are based on a realistic estimate of what the programme can achieve given the vastness of the programme area and the limited budget and time. Result indicators,

however, cannot be monitored by the use of existing statistical data, not least because of the lack of consistent and timely statistical data on NUTS3 level and across EU Member States and non-member countries.

As a result of these data constraints, the programme has decided to work with panels of regional experts who are asked to describe and assess the regional status quo in quantitative and qualitative terms in 2015 and assess the progress towards the achievement of objectives in 2017, 2019 and 2023. Rather than monitoring the entire programme area, a sample of three regions, defined on NUTS3 level, was selected and an expert panel constituted for each result indicator.

**Fig. 2:** Population density and main settlements in the programme area per NUTS 3 2010 region (Sources: EUROSTAT, 2012; EuroGeographics Association and Central Statistics Office Ireland for administrative boundaries).



1.2.1 Step 1: Selection of sample regions

The criteria for the selection of sample regions:

- Sample regions are selected based on the NUTS 3 statistical areas; the exception are the Faroe Islands and Greenland, which are considered in their entirety due to the small size of their population.
- Sample regions shall be among the remotest and most sparsely populated regions within each country, drawing mainly on data on population density and size of urban centres in the region.
- The sample shall contain one region from Scandinavia (Finland, Sweden,

- Norway), one region from the British Isles (Scotland, Northern Ireland, Republic of Ireland) and one region/country from the North Atlantic Space (Faroe Islands, Iceland, Greenland).
- Sample regions shall capture the range of socio-economic conditions across the programme area by reference to indicator-specific statistical data.
- The representation of the eight programme countries across all expert panels shall be balanced.

Fig. 2 shows the differences in population density of NUTS 3 regions in the programme area, ranging from 207.8 inhabit-

Tab. 1: Table of selected regions per indicator.

		Indicator 1.1: Degree of transnational collaborations between SMEs and R&D	Indicator 1.2: Awareness of technology-driven public service provision	Indicator 2.1: Conditions for start ups	Indicator 2.2: Awareness of the business opportunities beyond local markets	Indicator 3: Awareness of energy efficiency opportunities & renewable solutions in housing and public infrastructures	Indicator 4: Preparedness of responsible authorities for sustainable environmental management
F11D	Pohjois- ja Itä-Suomi						
F11D7	Lappi	X			X		X
SE32	Mellersta Norrland						
SE322	Jämtlands län			X			
SE331	Västerbottens län					X	
N007	Nord-Norge						
N0071	Nordland		X				
IE01	Border, Midland and Western						
IE013	West					X	X
UKN05	West and South of Northern Ireland			X			
UKM6	Highlands and Islands						
UKM61	Caithness & Sutherland and Ross & Cromarty	X			X		
UKM64	Eilean Siar (Western Isles)		X				
IS002	Landsbyggð	X			X		
FO	Faroe Islands			X		X	
GR	Greenland		X				X

ants per km<sup>2</sup> in the Reykjavik capital area to 0.026 8 inhabitants per km<sup>2</sup> in Greenland. Data on population density and larger urban settlements, more detailed maps and data sources used for the selection of sample regions per indicator, based on indicator-specific statistical data, can be found in the technical report.

Tab. 1 summarises the regions selected for representation in the expert panels, based on the above defined criteria. Due to difficulties in finding regional experts willing to become part of the panel, we had to resort

to an alternative region in some cases. Note that only one set of regions was selected to cover both indicator 1.1 ‘Degree of transnational collaborations between SMEs and R&D’ and Indicator 2.2 ‘Awareness of the business opportunities beyond local markets’. Reason for merging indicator 1.1 and 2.2 was that both target regional small and medium-size enterprises and aim at the internationalization of SMEs, with the first indicator focusing on transboundary innovation cooperation between SMEs and R&D and the second indicator on inter-enterprise cooperation across borders.

### 1.2.2 Step 2: Selection of regional experts

An expert panel was set up for each result indicator. Potential experts were identified and approached by the Regional Contact Points based on a set of criteria to objectify the choice:

- Experts must have detailed insight into the regional situation regarding the target objectives of the programme, i.e. innovativeness and internationalisation of SMEs, entrepreneurship, telemedicine, building energy performance or climate change adaptation, and have the required indicator-specific expertise.
- Experts must have strong regional ties, but don’t necessarily have to be located

in the selected region.

- Experts must have well-established links with the immediate target groups of the actions that will be supported by the programme, i.e. those individuals and organisations that are meant to benefit directly from the programme results (e.g., SMEs, hospitals, local public authorities, etc.).

Tab. 2 gives an overview of the organisations and experts representing the selected sample regions in the six expert panels. More information on the required indicator-specific expertise can be found in the ‘results’ chapter for each indicator.

**Tab. 2:** Selected regional experts per indicator.

	Expert 1 (Scandinavia)		Expert 2 (British Isles)		Expert 3 (North-West Atlantic)	
	Organisation	Contact	Organisation	Contact	Organisation	Contact
<b>Indicator 1.1: Degree of transnational collaborations between SMEs and R&amp;D</b>	Lapland Centre for Economic Development, Transport and the Environment	Mr. Risto Mäkikyrö <a href="mailto:kirjaamo.lappi@ely-keskus.fi">kirjaamo.lappi@ely-keskus.fi</a>	Inverness Chamber of Commerce	Mr. Ewan Ramsay <a href="mailto:ewan@inverness-chamber.co.uk">ewan@inverness-chamber.co.uk</a>	Economic Development Agency in West-Fjords <a href="http://www.atvest.is">www.atvest.is</a>	Mr. Shiran Thorisson, General Manager <a href="mailto:shiran@atvest.is">shiran@atvest.is</a>
<b>Indicator 1.2: Awareness of technology-driven public service (use of eHealth) provision in remote sparsely populated areas</b>	Senior Advisor to the Nordland County Council	Mr. Yngve Osbak <a href="mailto:fmnoyos@fylkesmannen.no">fmnoyos@fylkesmannen.no</a>	University of Aberdeen	Mr. David Heaney <a href="mailto:dhchrh@hotmail.co.uk">dhchrh@hotmail.co.uk</a>	Greenland Centre for Health Research	Mrs. Anne-Marie Ulrik, Executive Medical Officer <a href="mailto:amu@pegqik.gl">amu@pegqik.gl</a>
<b>Indicator 2.1: Conditions for start ups in remote and sparsely populated areas</b>	County of Jämtland	Mr Erik-Widar Andersson <a href="mailto:erik-widar.andersson@regionjamtland.se">erik-widar.andersson@regionjamtland.se</a>	Regional Business Team Invest Northern Ireland, Department of Enterprise Trade and Investment, South and West of the region	Ms Patricia Devine <a href="mailto:patricia.devine@investni.com">patricia.devine@investni.com</a>	Faroese House of Innovation	Mr. Rani Nolsøe, Director <a href="mailto:is@is.fo">is@is.fo</a>

	Expert 1 (Scandinavia)		Expert 2 (British Isles)		Expert 3 (North-West Atlantic)	
	Organisation	Contact	Organisation	Contact	Organisation	Contact
<b>Indicator 2.2: Awareness of the business opportunities beyond local markets</b>	Lapland Centre for Economic Development, Transport and the Environment	Mr. Risto Mäkiyö <a href="mailto:kirjaamo.lappi@ely-keskus.fi">kirjaamo.lappi@ely-keskus.fi</a>	Inverness Chamber of Commerce	Mr. Ewan Ramsay <a href="mailto:ewan@inverness-chamber.co.uk">ewan@inverness-chamber.co.uk</a>	Economic Development Agency in West-Fjords	Mr. Shiran Thorison, General Manager  <a href="mailto:shiran@atvest.is">shiran@atvest.is</a>
<b>Indicator 3: Awareness of energy efficiency opportunities and renewable solutions in housing and public infrastructures in remote and sparsely populated areas</b>	Region Västerbotten	Ms. Lena Friberg  <a href="mailto:Lena.friberg@regionvasterbotten.se">Lena.friberg@regionvasterbotten.se</a>	Mayo County Council	Mr. Enda Casey  <a href="mailto:ecasey@mayo-coco.ie">ecasey@mayo-coco.ie</a>	Faroese Earth and Energy Directorate	Mr. Bjarti Thomsen  <a href="mailto:Bjarti.Thomsen@jardfeingi.fo">Bjarti.Thomsen@jardfeingi.fo</a>
<b>Indicator 4: Preparedness of responsible authorities for sustainable environmental management in remote and sparsely populated areas</b>	Lapland Centre for Economic Development, Transport and the Environment (ELY Centre)	Ms. Eira Luokkanen, Senior Adviser  <a href="mailto:kirjaamo.lappi@ely-keskus.fi">kirjaamo.lappi@ely-keskus.fi</a>	Geography Department of NUI Galway	Dr. Kevin Lynch  <a href="mailto:kevin_lynch@nuigalway.ie">kevin_lynch@nuigalway.ie</a>	Government of Greenland, Climate and Energy Office (on sabbatical)	Mr. Jens-Peter Bak Henriksen  <a href="mailto:jpbhgreenland@gmail.com">jpbhgreenland@gmail.com</a>

### 1.2.3 Step 3: Development of indicator scoreboards

The tentative indicators defined in the Programme Strategy were translated into composite indicators, thus constructing a scoreboard per indicator, which captures the different dimensions of the original indicators. Conceiving of the indicators not as separate, but as conjoint dimensions allows constructing typical profiles for each region and paying attention to the variations within each regions rather than relying on a single measurement result. It also provides evaluation with a (multi-dimensional) point of comparison and measures change in the overall composition of factors (i.e. the profile) rather than along single lines. Draft scoreboards were developed based on desk research and the mapping of conditions and factors that are known to influence the composite indicators. Out of these, a number of sub-indicators were proposed, which satisfy the following conditions<sup>1</sup>:

- They are close to the typical types of interventions of NPA projects, so that ‘what is measured’ is in line with ‘what can be influenced’ by the NPA cooperation programme, with its limited budget and duration.
- Wherever applicable, indicators and definitions are based on existing (EU, Eurostat, OECD, etc.) survey methodologies, guidelines and studies to warrant

the indicators’ comparability with other European studies.

Apart from these criteria, experts must be able to assess the indicators without too much guessing involved. Nevertheless, they may estimate the range in which they expect the value to lie, providing some indication as to the confidence of the assessment. Scores were either defined on a scale 0 to 10 (e.g., degree of horizontal integration and coordination of climate change adaptation) or in terms of percentage (e.g., share of patient-to-professional consultations carried out remotely) to provide enough room for differentiation between the regions and to choose a measurement scale that is intuitive<sup>2</sup>. Additionally, experts were asked to justify their judgement and explain the underlying assumptions made to arrive at the assigned score.

It is important to note that the focus of the expert assessments is on the relative difference between the regions and on the relative change over time, expressed as the relative (percent) change vis-à-vis the status-quo rather than as a target defined in absolute terms. Therefore experts must not only have an in-depth insight into the situation regarding the region they repre-

<sup>1</sup> An ‘objective’ composite indicator should cover all relevant factors that compose the indicator. However, for the purpose of this exercise the indicators defined in the programme strategy were interpreted freely, and sub-indicators were chosen mainly on their expected sensitivity to capture the impact of projects under the NPA programme without any claim to comprehensiveness. For example, Indicator 2.1 on ‘conditions for start-ups’ focuses on public policy interventions and support structures for start-ups, leaving aside other important conditions for business creation.

<sup>2</sup> One exception is Indicator 3 where the expert panel decided unanimously to go for absolute indicators and measure the energy performance of the regional residential and public building stock in terms of kWh/m<sup>2</sup>/annum.

sent, but also a good understanding of the situation in the two other regions represented in the panel. To ensure ‘calibrated’ assessments, five expert panel meetings were conducted between mid May and mid June. The main objective of the meetings was to finalise the scoreboards based on the experts’ feedback on the proposed indicators and on their ability to assess them. In addition, tentative scores and targets were set per indicator, which were then revised after the meeting by the experts, often by consulting other regional experts.

In spite of the effort to get objective and comparable scores per region, a certain degree of subjectivity was accepted as the focus of the assessment is on the development of each indicator over time and not on benchmarking the sample regions, which are meant to be only proxies for the entire (remote and sparsely populated part of the) programme area. For the same reason, no scaling of regional scores by a size measure (e.g., population, trade volume, etc.) was applied to account for differences in the size of the sample regions.

Beside the quantitative assessment, emphasis is placed on capturing the qualitative dimension of change, e.g., (anecdotal) evidence of intangible impacts (e.g., whether experts perceive a change in awareness, growing public interest and debate in the region, influence on political positions, etc.), and collecting information on the framework conditions that are known or expected to influence the indicator (e.g., barriers and drivers, etc.).

#### 1.2.4 Step 4: Establishment of baseline values and targets

By convention, one baseline value and one target value per result indicator have to be reported to the European Commission. For each indicator a composite index was calculated for the base year 2015 and the year 2023 by aggregating the unweighted and normalised sub-indicators of all three expert assessments. Normalisation is nec-

essary to convert the sub-indicators, which often have different measurement units, into unitless indicators that can be aggregated. Two normalisation methods were used (for more explanation see OECD and Joint Research Centre, 2008):

- z-score normalisation converts indicators to a common scale with a mean of zero and standard deviation of one. It is best suited to compare how the different regions score, by indicating how far they are from the group mean in terms of standard deviations. With a view to allow comparisons between years, each sub-indicator  $q$  of region  $c$  for year  $t$  was normalised using the values of the mean and standard deviation of the three regions for the reference year 2015:

$$I_{qc}^t = \frac{x_{qc}^t - x_{\bar{c}}^{2015}}{\sigma_{qc=\bar{c}}^{2015}} \quad \text{or} \quad I_{qc}^t = \frac{x_{\bar{c}}^{2015} - x_{qc}^t}{\sigma_{qc=\bar{c}}^{2015}} \quad (1\&2)$$

With  $x_{qc}^t$  being the individual sub-indicator score,  $x_{\bar{c}}^{2015}$  being the mean of all three regions in 2015, and  $\sigma_{qc=\bar{c}}^{2015}$  being the standard deviation of the three regions for the reference year 2015. Equation 1 is applied to sub-indicators for which an increasing score means an improvement of the situation in the region (e.g., higher share of renewables of the total building energy consumed). For sub-indicator for which a decreasing score means an improvement of the status-quo (e.g., lower annual final energy consumption per m<sup>2</sup>), equation 2 is used.

- The percent increase normalisation method sets the base year value to 100 and calculates the growth rate relative to the base year 2015. It is best suited to show the development over time. With a view to track the relative performance of each region with respect to its own state in 2015, the regional indices were calculated as follows:

$$I_{qc}^t = \frac{x_{qc}^t}{x_{qc}^{2015}} \cdot 100 \quad \text{or} \quad I_{qc}^t = \frac{x_{qc}^{2015}}{x_{qc}^t} \cdot 100 \quad (3\&4)$$

With  $x_{qc}^t$  being the individual indicator score for sub-indicator  $q$  of region  $c$  for



year  $t$  and  $x_{qc}^{2015}$  being the score for sub-indicator  $q$  of region  $c$  for 2015. Equation 1 is used when an increase of the indicator and equation 2 when a decrease of the indicator indicates improvement.

All composite indicators are weighted equally. A differential weighing of sub-indicators was discussed at the panel meetings, but experts either considered all factors equally important or found that each region would weigh the sub-indicators differently due to regional needs and priorities.

To obtain one aggregated composite value  $CI_c^t$  per indicator and year, the weighted and normalised individual indicators were summed according to:

For z-score normalised indicators:

$$CI_c^t = \sum_{q=1}^Q w_q I_{qc}^t \tag{5}$$

with  $w_q$  being a weighing factor (in this case 1 divided by the number of sub-indicators) and being the normalised sub-indicator  $q$  for year  $t$  and the mean of all three regions.

For indicators normalised to indicate a percent increase:

$$CI_c^t = \prod_{q \in I_1} \left( \frac{x_{qc}^t}{x_{qc}^{2015}} \right)^{w_q} \cdot \prod_{q \in I_2} \left( \frac{x_{qc}^{2015}}{x_{qc}^t} \right)^{w_q} \cdot 100 \tag{6}$$

where  $I_1$  is the set of indicators for which an increase indicates an improvement,  $I_2$  is the set of indicators for which a decrease indicates an improvement and  $w_q$  is a weighing factor (in this case 1 divided by the number of sub-indicators, thus weighing all indicators equally). Targets for 2023 were determined in the same way as the 2015 baselines. Experts were asked to define quantitative targets for 2023 either in terms of a

- ‘target score’ (e.g., the % of SMEs and R&D institutions in the region involved in transboundary innovation cooperation will increase from 2.5 to 3 % until 2023),
- range of scores (e.g., the % of SMEs and R&D institutions in the region involved

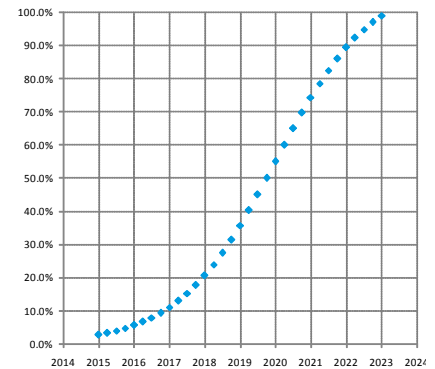
in transboundary innovation cooperation will increase and will be in the range of 1 to 3% in 2023),

- percent change (e.g., the % of SMEs and R&D institutions in the region involved in transboundary innovation cooperation will increase by 5 %).

It should be added that a high forecasted percent increase in a region does not necessarily mean that this region expects more effort being put into improving the status-quo (e.g., into improving the availability of support services for regional start-ups aimed at developing human capital) compared to the two other sample regions, but may indicate that it starts from a lower level where more can be achieved with fewer means.

Line diagrams were used to visualise each region’s profile and subsequent changes to the profile in order to compare regions as regards their baselines and targets. Assuming a development of the indicators that follows a general logistic function, i.e. a slow development regarding results in the first half of the programming period and an accelerated growth in the second half of the period and towards 2023, interim targets for 2017 and 2019 were defined.

Fig. 3: Assumed development of indicators between 2015 and 2023 for the definition of interim targets.



### 1.2.5 Step 5: Follow-up assessments

Progress towards the specific objectives of the programme will be measured in 2017, 2019 and 2023 based upon the baseline assessments. The method will be the same, except that follow-up measurements will be carried out ‘remotely’ via email. Experts will be asked to justify their assessment to capture an upward or downward trend, even if the score has remained the same. Attention will be paid to gathering also anecdotal evidence of change.

# 2. Results per indicator

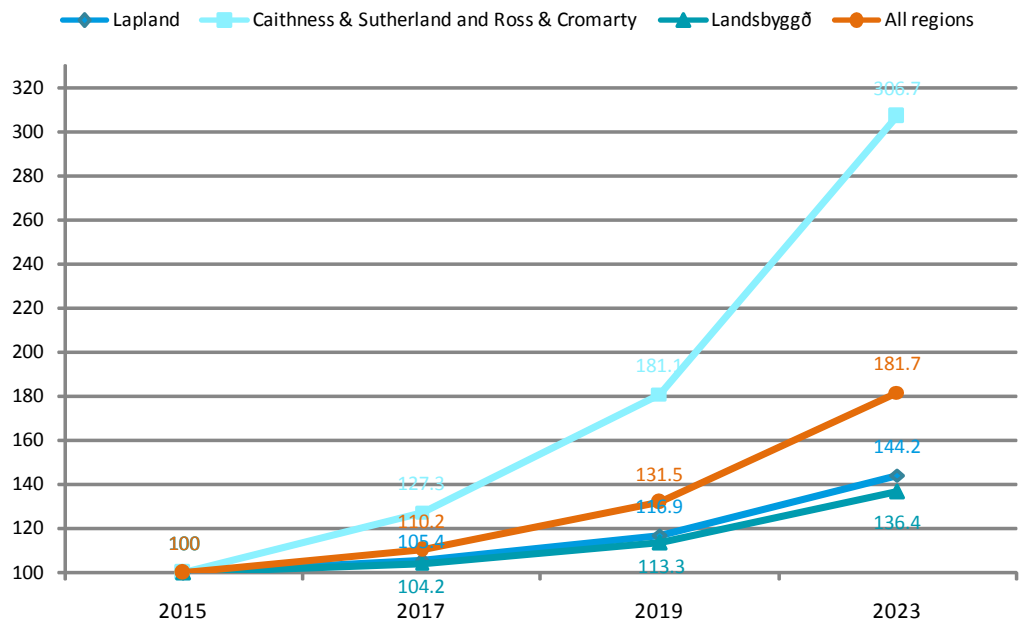
## 2.1 Indicator 1.1: Degree of transnational collaborations between SMEs and R&D

### 2.1.1 Baseline values and targets

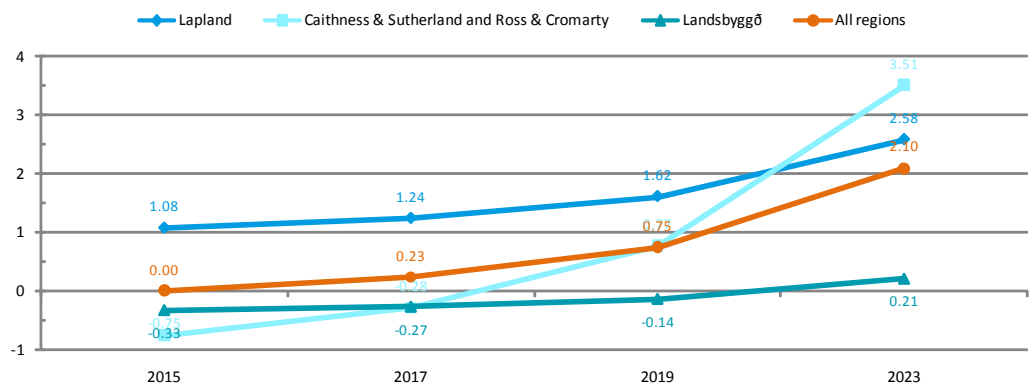
The **baseline** for the composite indicator ‘Degree of transnational collaboration between SMEs and R&D’ is **100 ±10%**. The **target** for 2023 was set at **181.7 ± 2.5%**, thus, forecasting an enormous improvement in innovation cooperation and innovation support by ~82% over the next eight years. However, the forecasted increase is unequally distributed, with the largest improvement expected to take place in the Caithness & Sutherland and Ross

& Cromarty region of Scotland and only a moderate improvement expected for the Landsbyggð region of Iceland. It has to be noted that the size of the regional business population varies considerably between the regions, ranging from about 10,000 SMEs in Landsbyggð, to around 8,500 SMEs in Lapland and 1,500 SMEs in the Caithness & Sutherland and Ross & Cromarty region of Scotland.

**Fig. 4:** Expected development of the regional and overall composite indicator 1.1 between 2015 and 2023 in % increase.



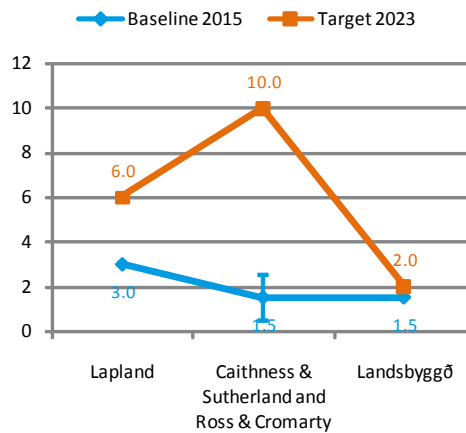
**Fig. 5:** Comparison of regional composite indicators 1.1 showing the distance of each region to the mean value in number of standard deviations.



Regarding SMEs and R&D cooperating across borders on product and/or process innovation, a general remark was that all three sample regions face a small number of SMEs, estimated at 5-10% of the total number of regional SMEs, that aspire to growth and, hence, to being innovative. This is particularly true for Lapland and the Caithness & Sutherland and Ross & Cromarty region of Scotland, whereas Icelandic businesses are traditionally export-minded. The potential target group for innovation cooperation and innovation support is therefore inherently small and was estimated, in all three regions, to be between 0.5 and 3%. Exact figures on the number of SMEs cooperating internationally on innovation are not collected in any of the regions, which is why most experts chose to estimate the range in which they expect the true number to lie. EUROSTAT data on innovation cooperation between SMEs and R&D from the 2012 Community Innovation Survey show that, nationally, the share of businesses engaged in innovation cooperation with (national and foreign) public or private research institutions is in the order of 11% (for the UK) and 22% (for Finland), providing evidence of the plausibility of the experts' assessments and explaining the higher score for Lapland, where especially the tourism industry works in close cooperation with R&D institutions.

Given the low level of ambition of rural SMEs regarding business expansion and internationalisation, tackling the reasons for these low aspirations would be an important prerequisite for noticeably raising the number of SMEs engaged in (transboundary) innovation (cooperation). Nevertheless, all three experts expect an increase in transboundary innovation cooperation over the next eight years. In Scotland, many of the interventions being piloted and initiated at the time of the baseline assessment will be coming to fruition within the next five to 15 years. In Lapland, an increase is expected due the limited size of the local market which will drive SMEs

and R&D to look outside Iceland for growth and cooperation.



**Fig. 6:** Regional baselines and targets for Indicator 1 'Share of SMEs and R&D institutions in the region involved in transboundary innovation cooperation on product or process innovation' [0; 100%].

As for the availability of innovation support services and structures for regional SMEs, all regions are well-endowed with services providing support in the area of innovation and technology transfer, even though none of the services are exclusively focusing on transboundary innovation cooperation. Equally large is the number of actors and organisations in all three regions. In Lapland, beside the four regional organisations that support internationalisation, and which have recently been grouped (together with other organisations) into the 'Team Finland' network, also municipal organisations are engaged in innovation support. In the Caithness and Western Ross area of Scotland, services for SMEs are mainly provided by Highlands and Islands Enterprise, the Scottish Government's economic and community development agency, and Interface, a national organisation with a dedicated Highlands & Islands team. Available services include a match making service connecting businesses with expertise, knowledge and research facilities available in Scotland's universities and research institutes, an innovation voucher scheme that helps businesses access knowledge from higher education institutions to develop new products and processes and a research and development funding scheme granting assistance to support fundamental research, industrial research and experimental development. In Iceland, several

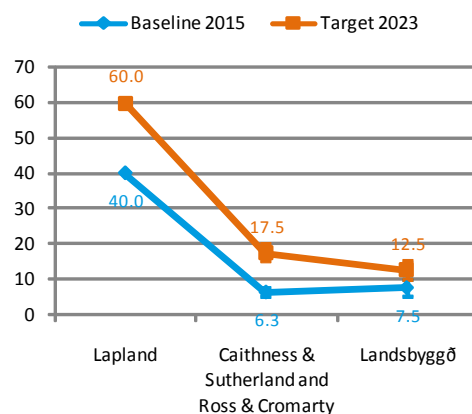
bodies support SMEs in their innovation and internationalisation endeavours such as the Innovation Centre Iceland, which has offices in the peripheral regions, the Regional Institute of Iceland, which supervises the introduction of regional development strategies and the Regional Economic Agencies, which work on a regional level and in close cooperation with the local municipalities and several regional investment funds. In addition, all three countries are part of the Enterprise Europe Network whose mission is to help SMEs innovate and grow internationally. However, there is no Enterprise Europe Network contact point in the selected regions.

The main gap identified in the current support landscape in Lapland and Iceland is access to finance for innovation. Lapland lacks a network of business angels and venture capitalists in the region, even though, on the upside, there is also less competition among businesses when it comes to attracting investors compared to more urbanised and central regions of Finland. Likewise, the rural areas of Iceland are also struggling with the lack of venture capital and with the fact that they are less attractive to investors than urban centres. Furthermore, the rural regions of Iceland face the problem of brain drain and outmigration of highly skilled workers. The Lapland and Scottish expert both criticised the lack of coordination between the different innovation support bodies. A third barrier pertains to skills deficits of SMEs in the area of language skills, in particular of other Scan-

dinavian languages, and general business skills. While capacity building for SMEs is mostly focusing on market research, there is little support on the complex regulatory issues of exporting.

In light of the different expected developments concerning resources for innovation support, the outlook for 2023 varies in the three regions. Lapland observes a negative trend concerning resources and support structures within the region and a stagnation because of a recent administrative reform in Finland that has led to a decrease in resources and concentrating of resources outside of the northern regions. Responsibilities in the area of business support have been transferred to the municipalities who are as yet inexperienced with working with SMEs. A quantum leap forward regarding innovation support is expected in the Caithness and Western Ross area of Scotland. There are several reasons for that. On the one hand, support available to regional SMEs has not been delivered in a strategically coherent manner in the past, which led to uncertainty and confusion among potential beneficiaries. A new strategic and co-ordinated approach being developed will be in full delivery mode within the next one to 1.5 years, thus providing a lot of room for development. Secondly, the political and economic circumstances surrounding Scotland and the region are likely to ensure an even greater emphasis on innovation and technology transfer in the future. And thirdly, the level of funding being currently invested into the new Highlands and Islands University and College network is such that the Scottish Government and Highlands and Islands Enterprise won't allow this investment to be wasted, which is regarded as the future cornerstone of the region's economy. For the rural region of Iceland only a moderate increase concerning innovation support resources is anticipated, with an emphasis on municipalities that receive increased funding through specific regional growth plans. The rate of uptake of innovation support

**Fig. 7:** Regional baselines and targets for Indicator 2 'Availability of innovation support services and structures for regional SMEs' [0; 10].

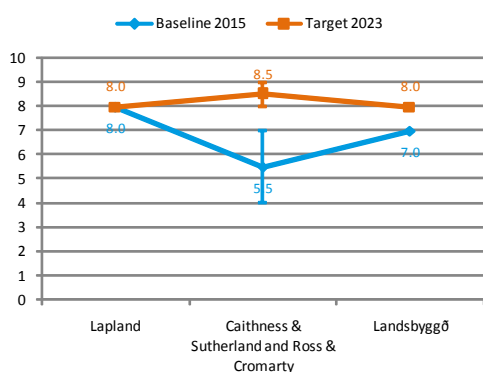


services for regional SMEs is linked to the number of SMEs that aim at being innovative. It is therefore generally low, with the exception of Lapland where knowledge of and uptake of national funding for innovation is high.

The high forecasted increase for Lapland can be explained by the proactive approach of business support bodies and innovation advisors in reaching out to their target group. In the Caithness and Western Ross landscape (and across Scotland), the positive trend regarding innovation support uptake is expected to continue. On the one hand, this is the result of significant changes to the economic position of Scotland, partly due to the Scottish independence referendum in 2014 and the Westminster elections in 2015, which has sharpened the mind of SMEs in terms of how they can grow and develop. On the other hand, Highlands and Islands Enterprise, Inverness Chamber of Commerce and the other regional stakeholders are now looking to offer a one stop shop of services to the SME community over the next three years, which will assist in driving uptake figures up. In the case of Landsbyggð, it is expected that with increased funding there will also be increased awareness regarding innovation support service in the rural part of Iceland, which will increase the rate of uptake.

of innovation support available in all three regions, and services are generally known to those SMEs that wish to innovate and/or export. The vast majority of rural SMEs, however, operate on a hand to mouth basis, seeking to survive, rather than to grow and expand. Often the economic development agency (and politicians) have growth aspirations that exceed the proper aspirations and needs of rural SMEs.

**Fig. 8:** Regional baselines and targets for Indicator 3 ‘Uptake of innovation support services for regional SMEs’ [0; 100%]. An overall conclusion is that there is plenty



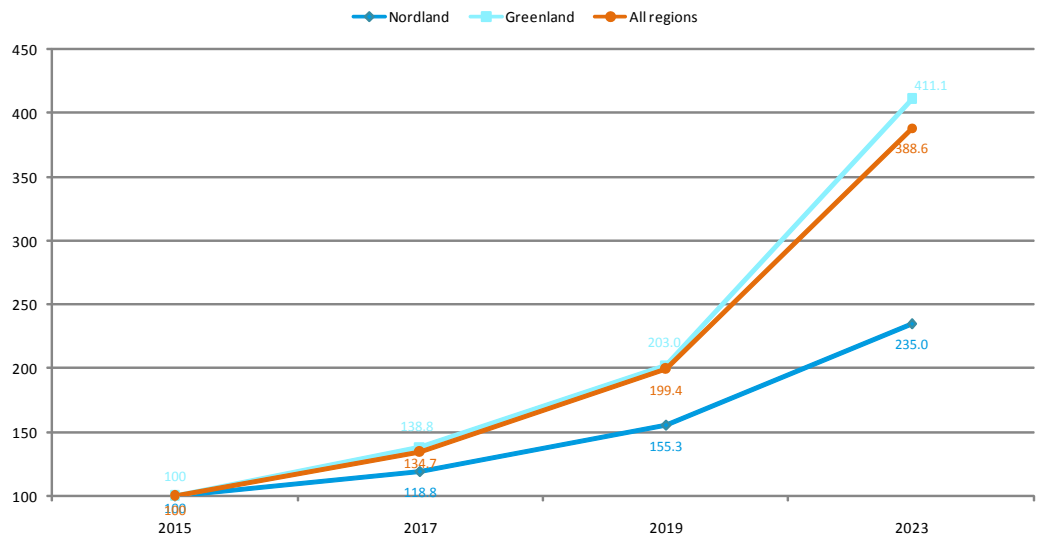
## 2.2 Indicator 1.2: Awareness of technology-driven public service provision in remote, sparsely populated areas

### 2.2.1 Baseline values and targets

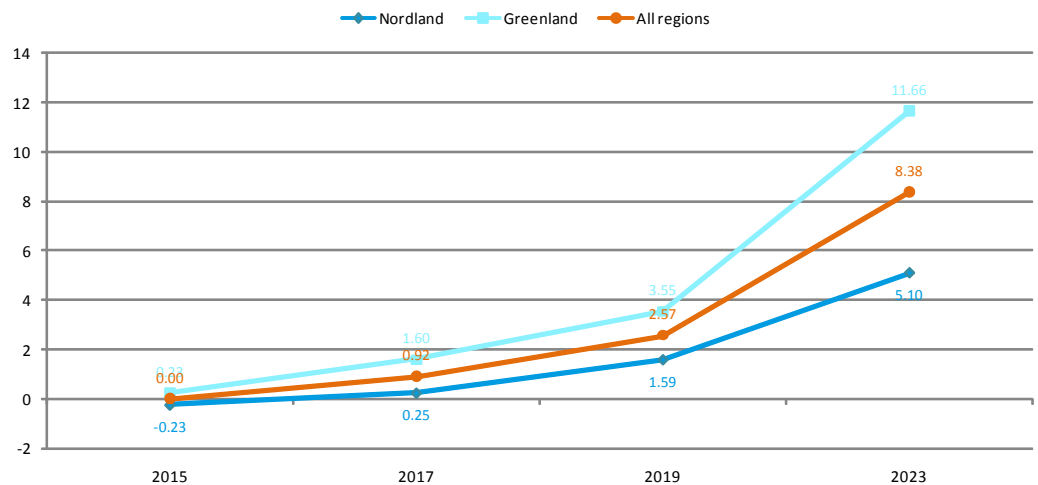
The **baseline** for the composite indicator ‘Awareness of technology-driven public service provision in remote, sparsely populated areas’ is **100 ±49%**. The **target** for 2023 was set at **388.6 ±20.2%**, thus, forecasting a significant improvement in the availability and use of telehealth services, almost a quadrupling of the status-quo, in two of the sample regions over the next eight years. Telehealth is expected to assume a much more important role in the future, driven by political objectives. In Nordland, there are concrete plans to handle all patients using electronic data transfer and videoconferencing in the near future, and improve the communication

between local and regional hospitals and actors in the municipalities, which will be implemented until 2030. In Greenland, the use of telemedicine is likely to increase because of the continued decentralisation of health care provision, leaving small health care centres without doctors on-site. Nevertheless, most indicator scores are subject to considerable uncertainty as these figures are based on estimates. However, both sample regions, Greenland and Nordland, are planning to monitoring the situation regarding the use of telehealth services more closely and on a routinely basis in the coming years, which means that much more accurate figures can be expected for

**Fig. 9:** Expected development of the regional and overall composite indicator 1.2 between 2015 and 2023 in % increase.



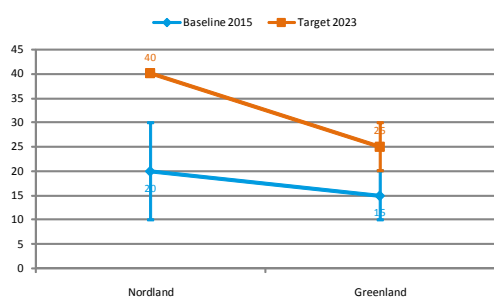
**Fig. 10:** Comparison of regional composite indicators 1.2 showing the distance of each region to the mean value in number of standard deviations.



the follow-up assessments. It is also important to note that there are major differences in the organisation of health care in each region. Obtaining comparable indicators is therefore challenging.

The share of patient-to-professional consultations carried out remotely via phone is in the order of 10 to 30% in both regions. Figures for Nordland would be much higher if phone consultations involving GPs and acute medical centres were included, while current figures focus only on regional hospitals. Since tasks and responsibilities have been transferred from the regional hospitals to the municipalities, GPs become increasingly important as concerns the implementation of telehealth. Figures on phone consultations with GPs will be included in the next assessment and from then onwards, which explains the high target value for 2023. In Greenland, consultations via phone are not sufficiently recorded. The estimate is based on the time scheduled for phone consultations. An increase can be expected due to organisational changes, which will lead to a further thinning out of local health care staff and increased need for remote consultations.

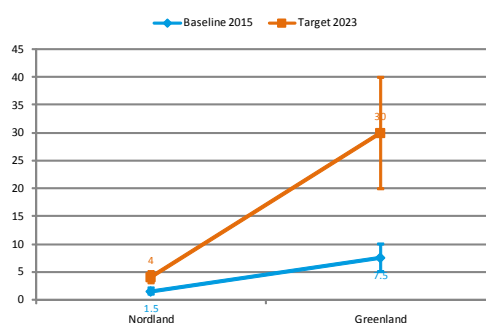
**Fig. 11:** Regional baselines and targets for indicator 1 'Share of professional-to-patient consultations in regional hospitals and health care centres carried out remotely via telephone [0-100%]'.



As regards professional-to-patient consultations in regional hospitals and health care centres carried out via video conferencing systems (VC), both regions are well-equipped with the necessary technology. In

Nordland, videoconferencing facilities can be found in the municipalities, hospitals, medical centres and in schools, most of which are connected to high speed broadband. Greenland's health stations, health centers and hospitals all are equipped with videoconferencing facilities and are connected to broadband internet with the exception of the eastern and northern part where the connection is established via satellite. However, available technology and devices are currently underutilised in both regions, mainly due to scepticism of health care workers and the need for more training on the use of the equipment. In Greenland, also the high turn-over of nurses and physicians and the general shortage of skilled personnel in the remote areas hamper the wider use of the technology. Concrete areas of application of VC in Nordland are videoconferencing for specific diagnoses, e.g. stroke ('Telestroke'), midwifery ('Born on broadband'), remote ECG consultation for the acute coronary syndrome and suspected STEMI (ST-segment elevation myocardial infarction) patients and in child/ adolescent psychiatry. Nevertheless, the use of VC is still in its infancy, but an increasing need and demand is estimated for remote medical consultations in the near future, mainly as a result of ongoing work on the VEMI (videoconferencing equipment developed, implemented and used in the emergency settings) system that standardises the use of VC in emergencies. In Greenland, telehealth is vital for health care provision and a range of telemedicine services are offered as they mean easier access to specialist examination and treatment and a reduction in transport costs.

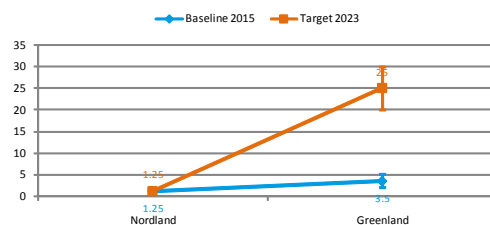
**Fig. 12:** Regional baselines and targets for indicator 2 'Share of professional-to-patient consultations in regional hospitals and health care centres carried out remotely via video link [0-100%]'.



Remote patient monitoring includes the self-monitoring of vital signs and medical parameters by patients or in decentralised health centres, which are then reported to health care professionals via phone, internet, etc. The transmission of data can be real time or the data can be stored and then forwarded. Also included are home-care services delivered remotely at clients' homes (e.g., the use of IT-based safety support services for elderly people).

Remote patient monitoring is still in an infant stage in Nordland. Some examples of what is already available are remote ECG monitoring, diabetes monitoring, and the sending of still pictures (e.g., of dermatological lesions). Furthermore, some safety support and GPS tracking is available in home-based care. Prerequisite for the expansion of these types of services is the definition of standards, common guidelines for implementation, maintenance and coordination in this field. In Greenland, a wide range of medical parameters are monitored remotely: ECG, pulse-oximetry, blood pressure, pulse, temperature, stethoscopy, otoscopy, different clinical photo techniques, spirometry, eye-examinations and, to a limited extent, ultrasound scans of pregnant women. Services are offered in health stations, health centres in the smaller towns and hospitals, and data transmitted via store and forward technology. No telehomecare services are available.

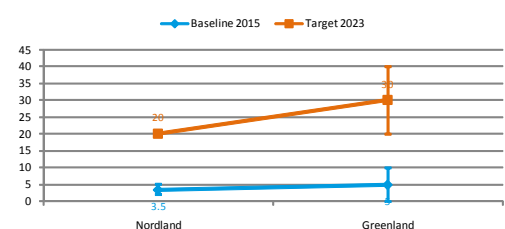
**Fig. 13:** Regional baselines and targets for indicator 3 'Share of patients whose health is monitored remotely through the use of telecommunication technology [0-100%]'.



The share of professional-to-professional instructions and training carried out remotely is currently rather low in both regions. In Nordland, so-called 'telestudios' are used a lot in training for both somatic and psychiatric care. Furthermore, the BEST (Better & systematic team training in emergency care) training in hospitals and

municipalities is a standard in the Northern Norway Regional Health Authority and in several municipalities. Two web-based interactive learning systems are in use, which can be integrated with the VC systems. However, this is still at the planning or testing stage. It can be said that the number of decentralized education programmes is likely to increase in the future, but not significantly. Regarding remote instructions, there are plans that severer cases will remain in the municipal health care, which means that the need for remote support from specialists will increase. In Greenland, the managers of the health centres and health stations are physically placed in the regional hospitals. VC is used for meetings between the management and local employees. To some extent, lectures, training and supervision is organised via VC, connecting health professionals situated remotely with colleagues in the regional hospitals and the main hospital in Nuuk. Examples are training on blood transfusion or on giving injections for assistant health workers. Training enhances networking among employees in the health care system and is actively requested by health care workers both to be more comfortable with their work but also to reduce travelling to reach educational offers in the nearest health centre, hospitals or in the capital. It is therefore likely to increase in the future.

**Fig. 14:** Regional baselines and targets for indicator 4 'Share of professional-to-professional instructions and training carried out remotely [0-100%]'.





## 2.3 Indicator 2.1: Conditions for start ups in remote and sparsely populated areas

### 2.3.1 Baseline values and targets

The **baseline** for the composite indicator ‘Conditions for start-ups in remote, sparsely populated areas’ is **100 ±5.8%**. The **target** for 2023 was set at **132.7 ±0.4%**, thus, forecasting a considerable improvement in entrepreneurial support in all three sample regions by ~33% over the next eight years. This reflects the level of ambition of the experts, who come from local or regional business development agencies and regional authorities and are directly concerned with business support, but also the political attention that entrepreneurship receives in all three regions.

The assessment of available support structures for (prospective) start-ups aimed at

developing human capital (i.e. entrepreneurial knowledge and skills) shows that all three regions are well endowed with (not for profit) services and programmes that build capacities in the area of management and administration, financing, marketing and sales and others. The West and South Region of Northern Ireland offers a large array of services ranging from general training courses and workshops to mentoring and individual counselling. A number of incubators provide shared space and business support. Furthermore, Ireland provides targeted growth and internationalisation support for promising young businesses. In the Faroe Islands, start-ups receive very personalised and individualised

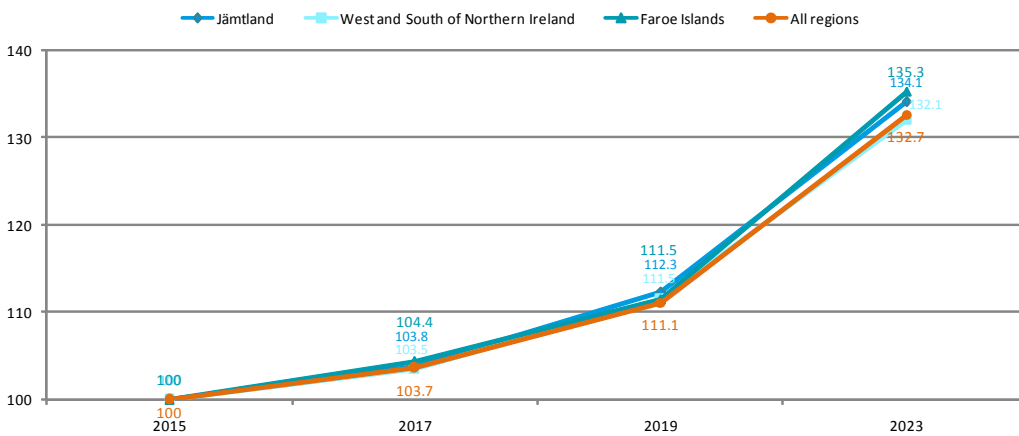


Fig. 15: Expected development of the regional and overall composite indicator 2.1 between 2015 and 2023 in % increase.

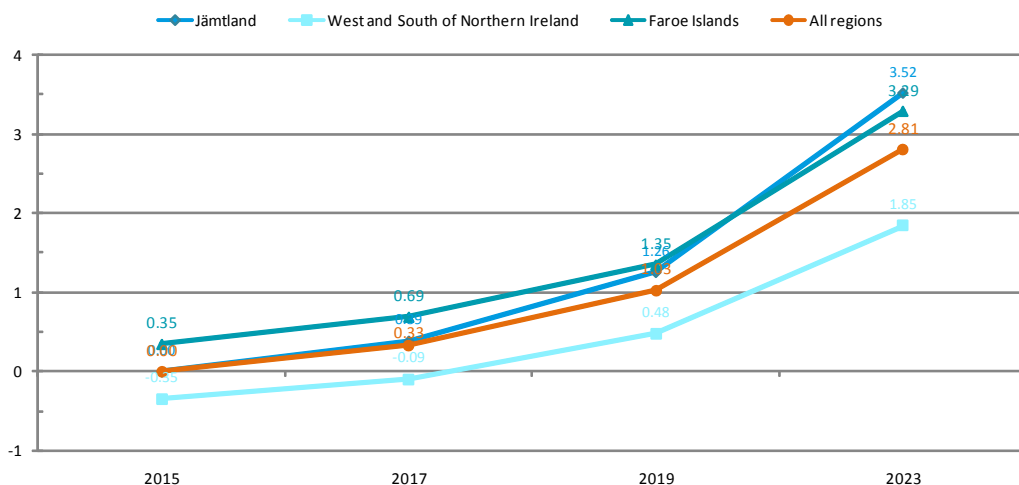
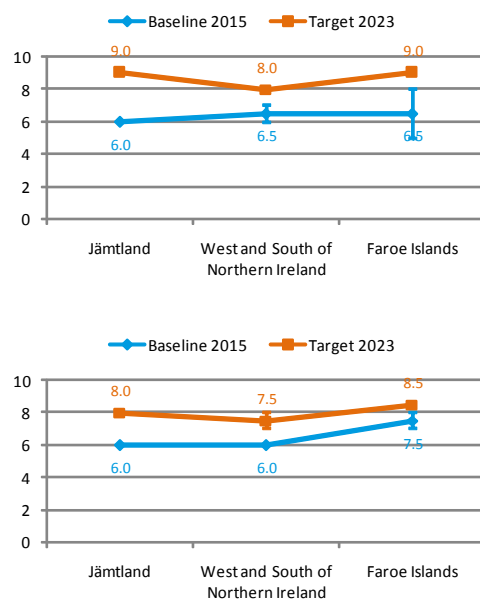


Fig. 16: Comparison of regional composite indicators 2.1 showing the distance of each region to the mean value in number of standard deviations.

support in the form of individual counselling and mentoring. In addition, the Faroe Islands conduct outreach activities that are aimed at informing a wide audience about the opportunities related to becoming an entrepreneur. All services are well utilised and well known since word-of-mouth advertising is very effective. The region of Jämtland has little permanent institutionalised support for start-ups with the exception of some incubators and the municipal business offices. Start-up support is mostly given on a project basis, financed through ERDF money, and is very tailor-made. Public interventions are mainly in the form of campaigns, which means that the system remains very responsive to trends.

**Fig. 17:** Regional baselines and targets for Indicator 1 'Availability of support services for regional start-ups aimed at developing human capital' [0;10] and Indicator 2 'Uptake of human capital development programmes for regional start-ups' [0; 10].



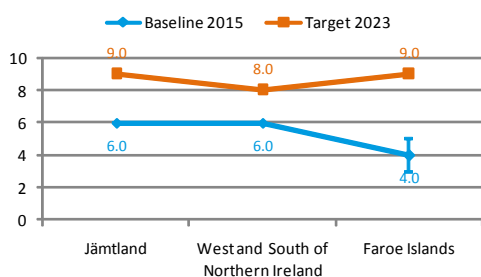
All three regions identified a gap in the current support system between general support and intensive support that nurtures businesses in the critical early stage investment phase, i.e. between starting up and expanding a business. The Faroese expert also diagnosed a lack of management and leadership qualities in young companies and the expert from Jämtland observed a general lack of competences of business development bodies in advising businesses that want to expand and grow. All three experts give a clearly positive outlook for 2023, mainly because of the increased political support for the subject.

However, both in the West and South Region of Northern Ireland and in Jämtland it is unclear how the support landscape will develop over the next years due to changes in structures and responsibilities. In the West and South Region of Northern Ireland programmes will be transfer to the new local councils, which will further fragment the support system. In Jämtland the business support system is currently undergoing reform, since Almi, the Swedish business development agency, will be focusing exclusively on advanced financing and advice for growing companies, transferring other tasks to the eight municipal business offices.

A host of services and programmes aimed at developing social capital (e.g., networking and matchmaking services) are available for start-ups in the three sample regions. The West and South Region of Northern Ireland offers a broad spectrum of services such as B2B events, a virtual meeting place, and support for establishing knowledge transfer partnerships between business and universities. Particular emphasis is put on encouraging cross-border and international business links and on connecting businesses with investors. The current situation is impaired by the lack of integration of the different providers of networking services who are often competing for participants and duplicate efforts. In Jämtland start-ups are strongly involved in project initiatives aimed at linking up businesses. The future focus will be on clustering businesses to tackle the transition between the start-up and the growth phase, which explains the anticipated improvement from a current score 6 to a score 9. The Faroe Islands are a small society of around 50,000 inhabitants and a network society that uses new social media and communication technologies very actively. Hence, there are few specialised programmes providing networking opportunities. Examples are the investors' meetings of hand-picked start-ups with investors, an initiative which will be intensified in the

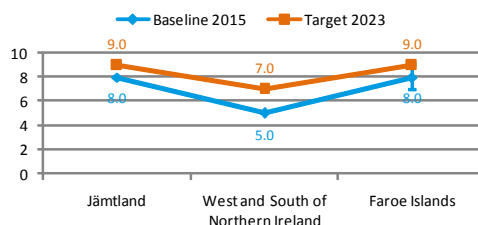
coming years, or a programme for university students working with businesses on real-life problems and a mentoring programme. Reaching out to big companies, who often don't see the relevance of linking up with new companies, appears to be the main obstacle. Nevertheless, the projected quantum leap from a current score '4' to a score '9' in 2023 might be too ambitious.

**Fig. 18:** Regional baselines and targets for indicator 3 'Availability of support services for regional start-ups aimed at developing social capital' [0; 10].



Regarding the development of business ideas in the regions, all three experts agree that the seed needs to be sown at primary and secondary school level. The West and South Region of Northern Ireland organises three different programmes for young people on ideas development. In Jämtland, an entrepreneurial education programme for upper secondary school, funded by the Interreg Sweden – Norway Programme, has been successful both in numbers and results. Also the Faroe Islands organise a young enterprise competition and participate in the European business games. Other incentive schemes and programmes that foster the generation of innovative ideas and support their development into marketable products and services are rare. All three regional experts agreed that more could be done in the area of supporting business idea development. In Jämtland, a past initiative taken by Almi resulted in more than 1,400 business and VAT registrations, corresponding to more than 1% of the regional population. Also all three experts criticised that applied research in regional universities that could lead to con-

crete business ideas and university spin-off companies is currently underdeveloped. Nevertheless, all three regions expect an improvement of the situation, not least because of the strong political backing of support for entrepreneurship in the regions.



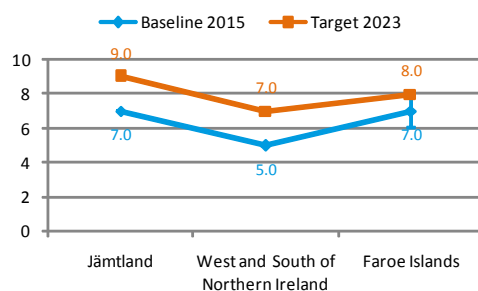
**Fig. 19:** Regional baselines and targets for Indicator 4 'Availability of programmes for the pre-start-up stage supporting the development of business ideas in the region' [0;10].

Entrepreneurial culture, i.e. an environment in which people are encouraged and empowered to innovate, create, and take risks, varies significantly across the three regions. Jämtland can be characterised by an exceptionally strong entrepreneurial culture, with 16% of adult population working as entrepreneurs. This culture is rooted in the region's historical heritage and tradition of allodial, subsistence farmers and is based on necessity to take initiative in a region that lacks large companies and employers. Since entrepreneurship is so widespread in the region, this leaves little room for more campaigning. The biggest challenge in the region is inducing a transition from a regional economic structure that is dominated by family-run businesses to a growth and export-oriented regional economy, which relates to a lack of ambition and capacity deficit of most regional SMEs. Also the Faroese have a strong propensity to becoming entrepreneurs, which stems from the fact that most Faroese are craftsmen and have developed many practical skills that can be potentially developed into business propositions. Nevertheless, there are several cultural barriers that hamper entrepreneurship: On the one hand, the Faroe Islands is a traditional gift economy, where capitalist thinking still has to be developed. On the other hand, in the small Faroese society people are very exposed and fear a loss of face if their undertakings fail. Both in Jämtland and the Faroe Islands role models are important in

creating a positive attitude towards entrepreneurship and positive values attached to being an entrepreneur (e.g., independence, self-realisation, creativity, wealth, etc.). The Faroe Islands foster the shaping of role models, e.g., through award schemes for best enterprise, innovation and investment of the year and awards for female entrepreneurs, a concept that is also pursued by the West and South Region of Northern Ireland. Both regions also rely heavily on the internet as tool for promoting entrepreneurship. In the West and South Region of Northern Ireland, considerable efforts have been made in past years to raise awareness and engagement levels (e.g., a 10 year national promotional campaign). However, achievements have been severely impacted by the unfavourable economic environment after the economic crises. Cultural barriers play an important role such as the preference of security over risk, the lack of role models, limited linkages between entrepreneurship and education and societal norms. All three regions give a positive outlook for 2023 due to the generally positive climate for entrepreneurship.

To conclude, all three regions show very distinct features regarding conditions for start-ups and the entrepreneurial climate in general. Differences between regions don't pertain so much to the types of support offered to start-up businesses, but rather to the structural conditions related to the regional economic structure, regional networks, regional institutional landscape, etc., under which start-ups have to operate and the entrepreneurial culture in the region. The latter, however, develops slowly over time and requires constant nurturing.

**Fig. 20:** Regional baselines and targets for Indicator 5 'Availability of programmes and policy initiatives fostering an entrepreneurial culture in the region' [0; 10].



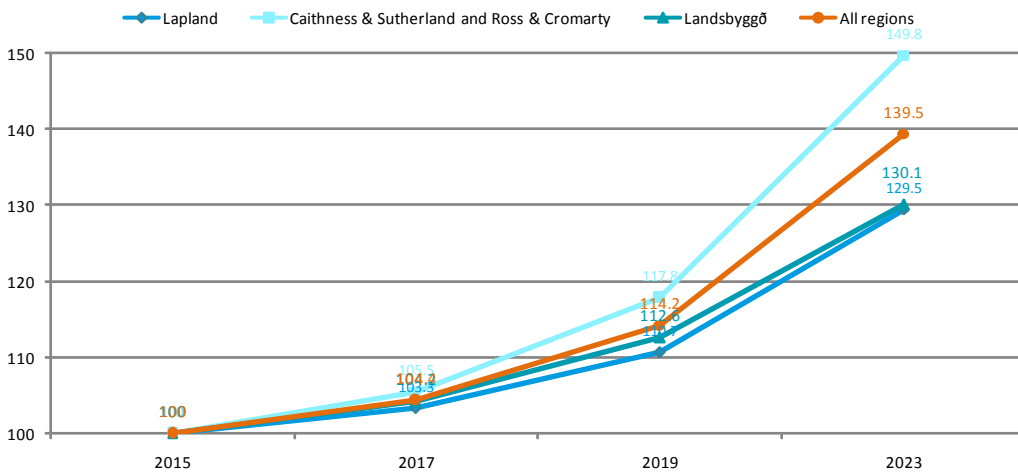
## 2.4 Indicator 2.2: Awareness of the business opportunities beyond local markets

### 2.4.1 Baseline values and targets

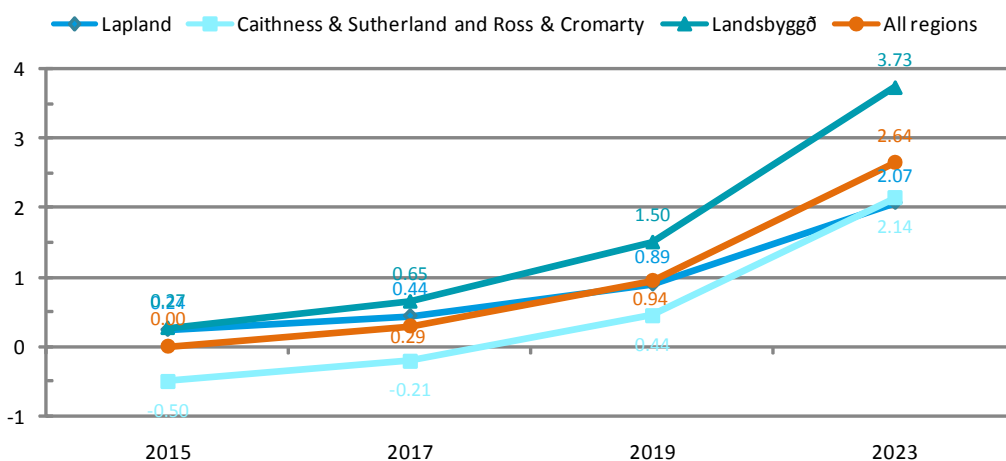
The **baseline** for the composite indicator ‘Awareness of the business opportunities beyond local markets’ is **100 ±9.9%**. The **target** for 2023 was set at **139.5 ±5.7%**, thus, forecasting a considerable improvement in the internationalisation of SMEs and internationalisation support in all three sample regions by ~40% over the next eight years.

To the same extent as with indicator 1.1 on innovation, indicator 2.2 is strongly influenced by the generally low level of ambition of rural SMEs to grow, with the exception of Iceland where, due to the small domestic market and sheer size of Iceland, key industries in the rural region are all export-driven, with many having already ventured overseas.

The share of SMEs in the region engaged in one or more transboundary inter-enterprise cooperation is in the order of 20 to 30% in all three regions. Figures are in line with the results of the Community innovation survey 2012, which obtains a similar result for the share of enterprises engaged in transboundary innovation co-operation. The definition of transboundary inter-enterprise relations includes all kinds of relations or forms of cooperation between SMEs from two or more countries, e.g., the delivery of goods and services from one enterprise to another which are used in the value chain of an enterprise, which has increased a lot with the advent of e-commerce. For example, becoming part of a web sales or booking portal has become



**Fig. 21:** Expected development of the regional and overall composite indicator 2.2 between 2015 and 2023 in % increase.

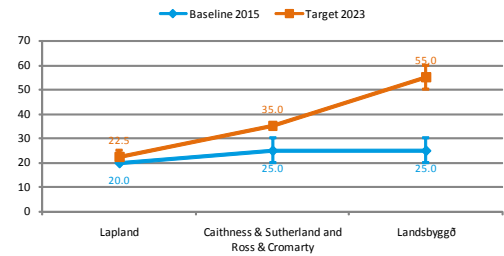


**Fig. 22:** Comparison of regional composite indicators 2.2 showing the distance of each region to the mean value in number of standard deviations.

very common, but requires no direct cooperation and interaction with the provider. Also the purchase of goods or services between businesses through electronic transactions conducted via the internet or other computer-mediated online communication networks has become commonplace and could be regarded as inter-enterprise relation. Therefore, only business relations with respect to a business's core activity, e.g., the supply of key components, joint development and marketing of a product or service, etc. were considered.

All three regions forecast a substantial increase in transboundary inter-enterprise relations over the next 8 years, although for different reasons. The positive perspective in Caithness & Sutherland and Ross & Cromarty region of Scotland is due to the core focus of the Highlands and Islands region's economic activity being on transboundary activity. Highlands and Islands Enterprise and the Scottish Government are placing a high level of importance on the development of transboundary inter-enterprise business networks, strategic alliances, clusters and joint ventures as part of their investment into the University of Highlands and Islands Campus development as well as their investments in networks such as Digital Health and others. In particular, the opening of the new University of Highlands and Islands Campus in Inverness in 2015 is expected to stimulate a lot of this activity targeted at internationalisation on a region wide basis. In Lapland, transboundary inter-enterprise relations are likely to increase due to the increasing North Calotte cooperation and strong markets in Northern Norway and Northern Sweden. In Iceland, there is already considerable inter-enterprise cooperation that stems from the export focussed production industries in the rural region, which is likely to continue to grow.

Fig. 23: Regional baselines and targets for Indicator 1 'Share of SMEs in the region engaged in one or more transboundary inter-enterprise cooperation' [0; 100%].



As for the availability of business support programmes to facilitate access to new markets for regional SMEs, in all three regions a host of services is offered. In Lapland, various national actors with offices in Lapland provide internationalisation support including funding for internationalisation. Organisations also have international offices that facilitate the entrance into foreign markets. Beside general support, there are also specific initiatives such as the one of the Regional Council of Lapland that fosters marketing co-operation for tourism in Lapland under the umbrella 'Lapland –Above Ordinary' or the well-developed cross-border co-operation with Sweden in the Tornio River Valley. Similarly, there are organisations that aim to attract foreign investors. Scotland has well-developed internationalisation support structures in place. The Scottish Development International Organisation has 42 offices in 20 countries across the world, but its focus is on the businesses in the Central Belt area of Scotland. Scottish Development International, in partnership with Highlands and Islands Enterprise and the Highlands Chambers of Commerce, deliver the Smart Exporter Programme which offers a free service aimed at building capacities in exporter companies. In countries where there is no Scottish Development International presence, local SMEs are able to tap into expertise and knowledge provided by the UK Trade and Invest Offices, who, in many cases have specific sectoral expertise within

markets. Some of these services are free of charge and others are chargeable on a commercial basis. One of the shortcomings of the current system is that organisations sometimes act in competition for businesses regarding their services. Furthermore, a lot of the support provided to date has been across the whole of Scotland and not just in Highlands and Islands, which has created unfair competition between regions when trying to internationalise and develop international relations, putting the remoter regions at a disadvantage.

Iceland has several (national) agencies active in the area of internationalisation support that, even though mainly focused on the capital region, have contributed to increased internationalisation of regional SMEs in past years: companies have had foreign investment, reached new markets, cooperated on innovation and created new business networks. Promoting Iceland is a one-stop-shop for support in marketing, trade, export, etc. Services include the organisation of trade fairs and business delegations, in-depth consulting, various training programmes and the provision of market information targeted at Icelandic as well as international clients. The Regional Institute of Iceland is a contact point for funding programs for projects that aim at increasing internationalisation. Innovation Centre Iceland is an information and mentoring centre for entrepreneurs and SMEs seeking assistance on anything to do with business ideas and the general management of companies. Advice can be sought from experts in various fields regarding guidance and information on a variety of aspects concerning ideas, management and overseas partnership. They operate the European Enterprise Network in Iceland and are cooperating with Promote Iceland and The Icelandic Centre for Research. Furthermore, embassies have business offices.

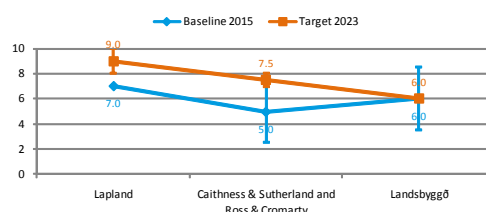
In addition, all three countries are part of the Enterprise Europe Network that provides access to market research, to agents and distributors and to country knowledge and expertise.

Regarding the 2023 target, a mayor change is underway in Highlands and Islands for a number of reasons. On the one hand, a significant amount of money and time is being put into developing transboundary opportunities and increased knowledge and capacity building for SMEs in the region. Secondly, the Team Scotland approach has been adopted, ensuring a more concerted approach. And thirdly, Inverness Chamber of Commerce has recently been granted the right to issue export certification as the only provider in the Highlands and Islands, which will enable the regional economic development activities to be more focused on the region and not on a Scotland wide basis.

The outlook for Lapland is positive as advising and consulting subsidies are increasing, mostly as a result of the Team Finland cooperation. At the same time, national funding for export rings, a joint project of four to six companies from the same sector in a target country or area receiving financial aid to initiate and develop export activity, will be stopped in 2016. As a general trend, services in the form of advice are increasing, while resources, i.e. subsidies, are decreasing.

The Icelandic expert expects no mayor improvement regarding available international support in the rural parts of Iceland, but rather that the prevailing focus and concentration of efforts on the capital region and urbanizations near the capital region is likely to continue. Reversing this trend would require a long term perspective, which is not to be expected in the foreseeable future.

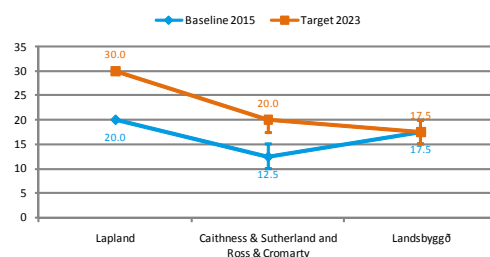
Fig. 24: Regional baselines and targets for Indicator 2 'Availability of business support programmes to facilitate access to new markets for regional SMEs' [0; 10].



Uptake of business support programmes for regional SMEs that facilitate access to new markets is estimated to be in the order of 10 to 20% in all three regions. In Lapland, the expected steep increase in the rate of uptake of internationalisation support is owed to the new networking approach for internationalisation and innovation services, i.e. the Team Finland network, which will improve co-ordination, and to the target of the Team Finland, which is to double export by the year 2020. Based on the evidence of investments currently being made in the region and the development of regional infrastructure being considered for the next decade, the rate of uptake of internationalisation support is expected to increase in the Caithness & Sutherland and Ross & Cromarty region of Scotland. Some of the expected increase will be owed to an increase in R&D through companies which, having set up business in the region, act as a catalyst for a sectoral hub. However, there are many uncertainties, which make a forecast difficult. In Lapland, the instability of the Russian market makes estimations difficult. In Scotland, the impact of the EU referendum in 2017 and potential for another Scottish referendum in the future and the challenges and issues surrounding the oil and gas industry is unknown. No increase in uptake is forecasted for the Landsbyggð region of Iceland. It is assumed that there will be a shift in the support programmes from providing hands on support towards providing more direct internationalisation support grants. Also the increasingly better educated workforce will be able to handle a majority of internationalisation work in-house in the future.

Generally, it can be concluded that bottlenecks for internationalisation are not to be found in the area of support structures, which are good to excellent in all three regions, but rather regarding the low level of ambition of many SMEs as concerns the full exploitation of their growth potential.

**Fig. 25:** Regional baselines and targets for Indicator 1 'Uptake of business support programmes for regional SMEs that facilitate access to new markets' [0; 100%].





## 2.5. Indicator 3: Awareness of energy efficiency opportunities and renewable solutions in housing sector and public infrastructures in remote and sparsely populated areas

### 2.5.1 Baseline values and targets

The **baseline** for the composite indicator ‘Awareness of energy efficiency opportunities and renewable solutions in housing sector and public infrastructures in remote and sparsely populated areas’ is **147 kWh/m<sup>2</sup>/a ±4.5 kWh/m<sup>2</sup>/a** for indicator 1 ‘Average annual final energy consumption for space heating and hot water in residential and public buildings in the region per net conditioned floor space in the base year’ and **28%** for indicator 2 ‘Share of final energy consumed in regional residential/non-residential public buildings coming from renewable sources in 2014’.

The **target** for 2023 for indicator 1 was set at **137.7 kWh/m<sup>2</sup>/a ±2 kWh/m<sup>2</sup>/a**, thus forecasting a moderate decrease in building energy demand in all three sample regions by ~5.7% over the next eight years. For indicator 2, the **target** for 2023 was set at **32.3%**, thus forecasting a considerable increase in the share of building energy coming from renewable sources in the three sample regions by ~15.8% until 2023. The normalised aggregated target (setting the baseline to 100 ±1.5%) is 111.1 ±0.7%, which indicates a percent change of the composite indicator of 11% over the next eight years (cf. Fig. 26).

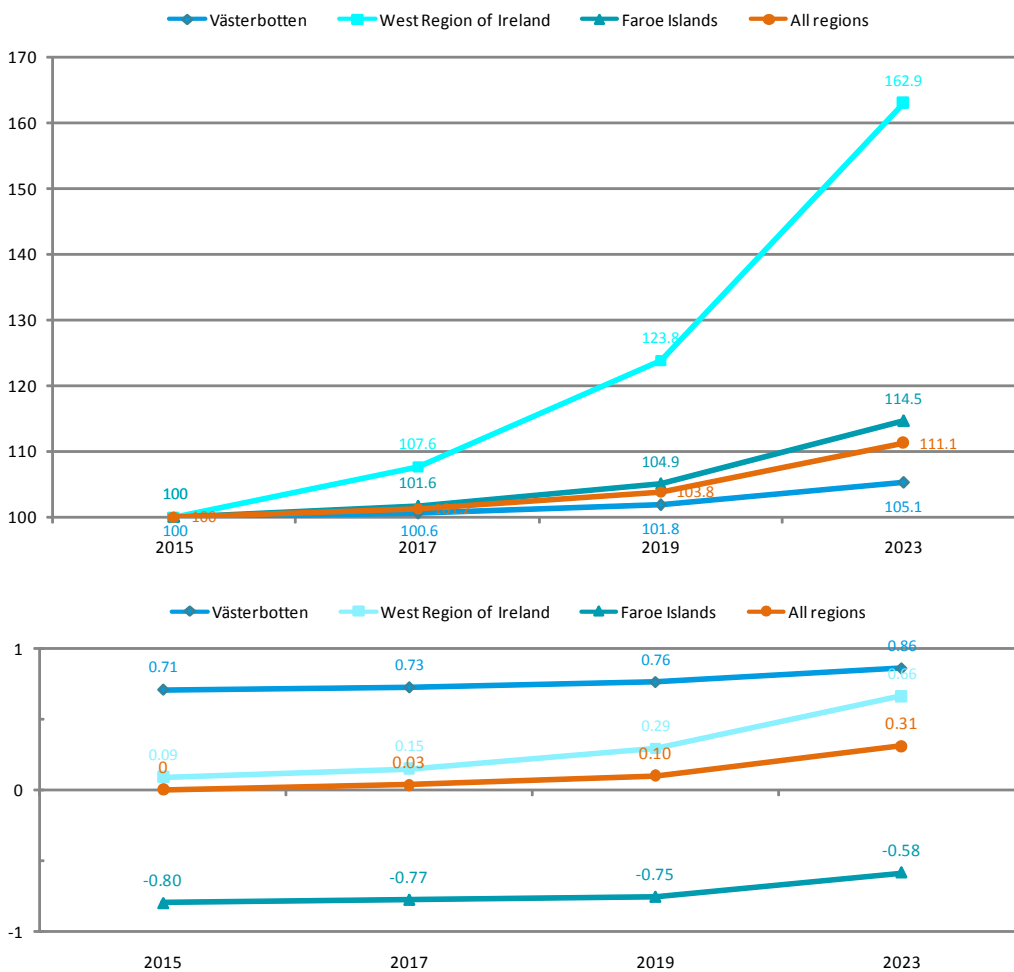


Fig. 26: Expected development of the regional and overall composite indicator 3 between 2015 and 2023 in % increase.

Fig. 27: Comparison of regional composite indicators 3 showing the distance of each region to the mean value in number of standard deviations.

<sup>3</sup> For example, no data for public non-residential buildings for the West region of Ireland were available.

Differences across regional baseline values strongly reflect differences in national energy policies, endowment with endogenous energy resources and differences in climate. Ever since the oil crisis of the early 1970s, Sweden has invested heavily into alternative energy sources aiming at phasing out the use of oil. Today, Sweden has the highest share of renewable energy of the total gross domestic consumption of the EU. Against this backdrop it must be added that Sweden also has among the highest per capita energy consumption in the EU, mainly due to its energy-intensive economy and transport sector. In the Republic of Ireland, the share of renewable energy of the total energy used is low, even though the country has seen a sharp increase in the exploitation of renewable energy sources in recent years. Furthermore, Ireland has a per capita energy consumption below EU-average and has achieved a significant decrease in energy consumption, also as a result of the economic recession. The development in both countries is strongly influenced by the EU 2020 energy and climate targets. The Faroe Islands, on the other hand, has only recently started to revise its energy policy and tap into its large wind power potential, which is among the highest in Europe. Being an archipelago of islands, the Faroe Islands are not connected to the mainland European grid and are heavily dependent on oil imports. The mid-term objective is therefore to generate nearly all electricity from renewable resources, mainly wind and hydro power, and switch from oil to electricity for space heating.

Indicator 1 'Average annual final energy consumption for space heating and hot water in residential and public buildings in the region per net conditioned floor space in 2014' shows that building energy consumption figures don't vary that much between the sample regions given the inherent inaccuracy that had to be accepted to obtain comparable figures for all three regions. Getting energy consumption

figures for public buildings turned out to be particularly difficult due to split ownership (municipal, regional, national public buildings) and missing data<sup>3</sup>.

The energy performance of the residential and public building stock in the Region Västerbotten can be said to be good, especially since, compared to the two other sample regions, the climate in Västerbotten is much harsher. The vast majority of regional buildings are supplied with renewable energy; mostly wood and wood pellets for heating in rural and semi-rural areas and district heating (97% renewable) in cities and urban areas. Geothermal heat pumps are also common. Furthermore, Sweden has a very pro-active information policy for households on how to save energy. Each municipality has an energy adviser who provides free-of-charge help and guidance. In public authorities, special energy-coordinators are employed to achieve energy savings and increase the share of renewable energy. Different sources of funding for energy-efficiency measures are available, e.g., financial support for installing solar panels, financial support for authorities to invest in energy efficiency in public buildings, etc.

In the West region of Ireland, residential buildings are rather poorly insulated and around 73% of all buildings use oil, gas or coal for heating. During the boom years, a lot of construction activity took place, paying little attention to the quality of the buildings' insulation and heating. Regarding district heating, currently there is only a pilot district heating system in operation in the region. Two substantive revisions to Ireland's Building Regulations (Part L – Conservation of Fuel and Energy) have made a large impact on the energy performance of the building stock. Since July 2008, all new domestic buildings are required to have a fixed contribution from renewable energy, either 10 kWh/m<sup>2</sup>/annum contributing to energy use for domestic hot water heating, space heating or cooling, or 4 kWh/m<sup>2</sup>/annum of electrical energy, or a combination of these, which would

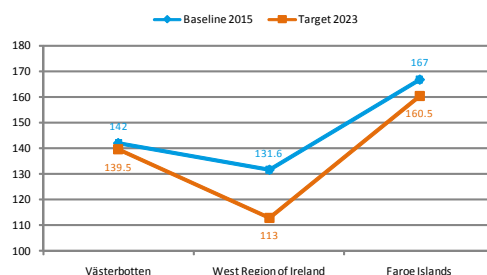
have the equivalent effect. Furthermore, the regulation details that replacement oil or gas boilers have to be condensing, where possible, and tightens the standards for insulation levels, ventilation and air infiltration, thermal bridging reduction, heating and hot water system controls and the insulation of hot water storage vessels, pipes and ducts. Grant support is available for financing up to 50% of the costs of energy efficiency upgrades for public housing and private residential buildings.

The Faroe Islands have the highest average building energy consumption of the three sample regions. Reducing building energy demand does not enjoy high political priority, and building regulations are not very ambitious and up-to-date. Nevertheless, new residential buildings are, in general, better insulated than what would be required by law. Measures into energy-efficiency of buildings are mostly driven by the oil price. As a result of the oil shock in 2008, building owners started installing heat pumps, but this development slowed down when the oil price fell again. Public buildings are very oil dependent and have seen little improvements in energy consumption over the years.

Targets for indicator 1 are moderate with the exception of the West region of Ireland. Buildings have a long lifespan and current renovation rates are in the order of 1% in the EU, which is why it takes a long time to substantially decrease the energy demand of the existing building stock.

In Västerbotten, building energy use is expected to decrease over the next eight years by 4.2% according to a forecast of the Swedish Energy Agency, based on the trend of the past years which have shown a steady decrease in building energy consumption. However, further energy improvements are expected to be moderate as many of the profitable improvements in the existing building stock have already been realised. The currently low energy prices and high costs of investments have increased the pay-off time and slowed down any further efforts into building energy retrofit. In

the West region of Ireland, an increase in building energy performance is expected as a result of ambitious building regulations, available funding and on-going education and awareness raising. The Sustainable Energy Agency Ireland forecasts an overall decrease in residential energy demand from 2010 to 2020 of 16%, based on past trend and under the assumption that measures and targets contained in the Energy White Paper, the National Energy Efficiency Action Plan and the National Renewable Energy Action Plan will be implemented as planned (Sustainable Energy Authority of Ireland, 2013). Only a moderate improvement can be expected in the Faroe Islands, where little progress has been made in decreasing the energy use in buildings in the past. A sudden increase in the oil price might spark renewed interest in alternative energy sources and energy-efficient building refurbishment. No independent energy advisory centres exist and grant support for energy-efficiency measures in buildings in the form of low-interest loans is not permanently available. However, a new building regulation is in preparation which will stipulate upper thresholds for the energy demand of newly constructed buildings, which certainly contribute to a future decrease in building energy demand.



**Fig. 28:** Regional baselines and targets for Indicator 1 'Average annual final energy consumption for space heating and hot water in residential and public buildings in the region per net conditioned floor space in 2014' [kWh/m²/a].

Indicator 2 'Share of final energy consumed in regional residential and non-residential public buildings coming from renewable sources in 2014' shows that renewable shares in building energy consumption vary considerably across the regions. The Region Västerbotten has a very high share of renewable energy of the total final energy consumed in buildings, which is expected

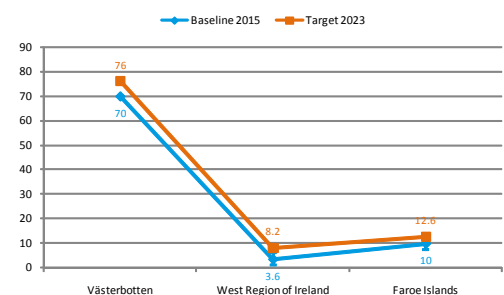
to further increase. Already in 2012, Sweden has overachieved its 2020 renewable energy target of 49% and is likely to hit the new 55% target in 2020 according to projections of the Swedish Energy Agency (2014). Most important sources of renewable energy for space heating and hot water preparation are biomass (wood and turf), heat pumps and hydro and wind power for electricity production. According to a forecast by the Swedish Energy Agency, the number of solar panels, heat pumps and biomass heating systems will further increase, while the demand of electricity will stagnate, and the number oil boilers will decrease until 2030. Based on projections regarding the overall increase in the share of renewables until 2020, a 0.9% annual increase was assumed regarding the share of building energy use covered by renewable sources.

The West region of Ireland has a very low share of renewable energy of the total energy consumed in buildings. The principal sources of energy supply to the residential sector are oil, peat (including turf), electricity, coal and natural gas. The total contribution from renewable sources to gross electricity consumption in 2013 was only 20.1% (Sustainable Energy Authority of Ireland, 2013). 1.27% of the share of renewables in the total final energy consumed in residential buildings in 2011 can be allocated to wood, 0.8% to geothermal heat pumps and about 1% to the renewable share of electricity production in the Counties Mayo and Galway. According to a forecast, the fuel share of renewables will still be 3% in 2020 while the share of electricity (all uses) will have increased to 29%. The expected average annual growth rate of the renewable share of electricity between 2016 and 2020 is 6.2% (Sustainable Energy Authority of Ireland, 2011). The predicted share of RES in the final energy consumed in residential buildings is therefore 8.2% in 2023, if only the heating energy demand is considered, and 17%, if all uses are considered.

The share of energy used in the Faroese residential and public building stock that comes from renewable energy sources was estimated at 10%, but might be somewhat lower, since district heating is only partly renewable, as waste heat from wind power production, as is heat produced by heat pumps, but both were counted as renewable. Main sources of renewable energy are heat pumps as well as wind and water for power production. Only a small number of houses are connected to a district heating system, using waste heat from electricity production. A 3% per annum increase in the area of energy supply for building energy use from renewable sources is expected. The mid-term target of the Faroe Islands is to become largely independent of oil and to generate most electricity from renewable sources by 2030. That will be achieved by electrifying all heating, which implies the need to produce more electricity.

As a general conclusion, it can be said that the seemingly accurate figures for indicator 1 and 2 might mask the fact that many assumptions had to be made to arrive at the data. The error range might be in the order of 10%. Nevertheless, since the focus of the assessment is on the development over time, and under the premise that assumptions are kept constant, the resulting composite indicator will be good enough to accurately point out the direction of change through time.

**Fig. 29:** Regional baselines and targets for Indicator 2 'Share of final energy consumed in regional residential and non-residential public buildings coming from renewable sources in 2014' [0; 100%].



## 2.6 Indicator 4: Preparedness of responsible authorities for sustainable environmental management in remote and sparsely populated areas.

### 2.6.1 Baseline values and targets

The **baseline** for the composite indicator ‘Adaptive capacity of public authorities to climate change impacts in remote, sparsely populated areas’ is **100 ±26.5%**. The **target** for 2023 was set at **131 ±22.9%**, thus, forecasting a noticeable improvement by

31%. A general observation is that personal experiences and work satisfaction can be said to have played a role in the assessment that must not be underestimated, especially in the case of the two experts that come from a regional or national authority.

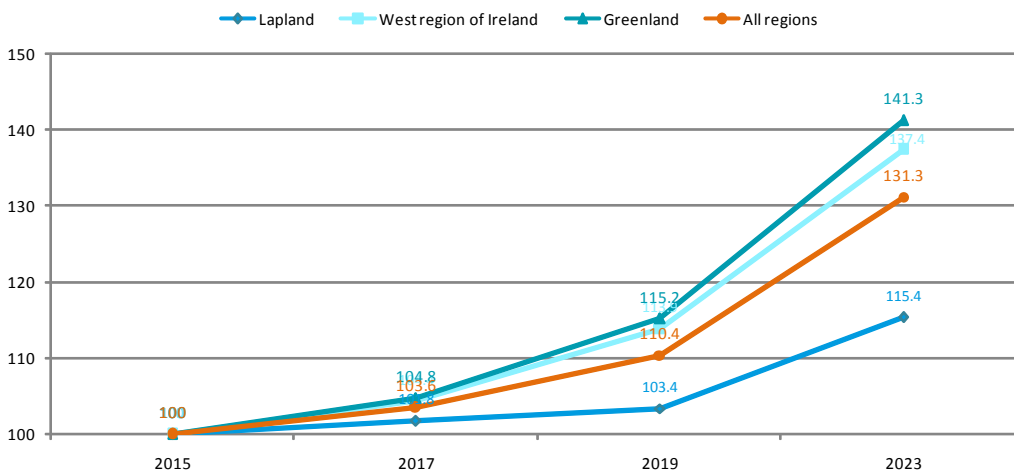


Fig. 30: Expected development of the regional and overall composite indicator 4 between 2015 and 2023 in % increase.

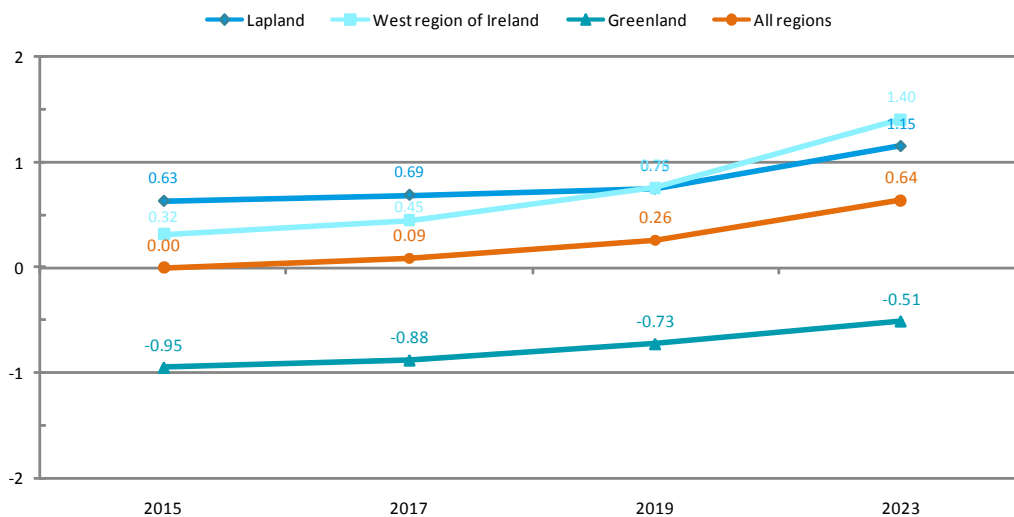


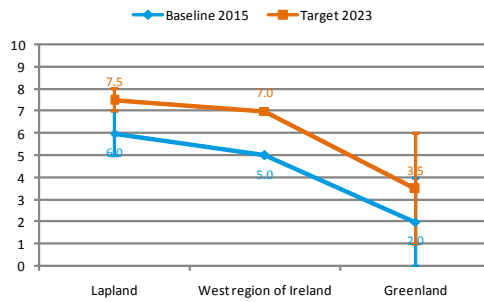
Fig. 31: Comparison of regional composite indicators 4 showing the distance of each region to the mean value in number of standard deviations.

Lapland and the West region of Ireland have the necessary structures and policies in place to ensure a good horizontal, i.e. between sectors and departments, and vertical, i.e. between governance level, integration and coordination of climate change adaptation. Several bodies in Ireland and the West region are entrusted with the coordination of climate change issues on regional and national level. Lapland can

point to national climate change (adaptation) strategies as well as a regional climate change strategy. Both regional experts report that framework conditions for climate change adaptation are good, but implementation falls short of expectations, mainly because strategies and plans don't translate into concrete actions or because coordinating bodies are not as active as they could be. The Greenlandic expert rates

the current situation as ‘poor’, criticising the prevailing silo thinking of Greenlandic authorities and the lack of coordination across ministries and departments. Given the small size of the Greenlandic society, in which informal cooperation through personal networks plays an important role, and the comparatively large public sector, this seems like a paradox. Reasons for the poor horizontal and vertical coordination are the high staff turnover in the Greenlandic administration and the low level of specialisation of public servants. The situation was further impaired by an administrative reform in 2009, which reduced the number of municipalities from 17 to four, resulting in an increased centre – periphery distance and removed qualified jobs from smaller municipalities, reducing capacities in the remotest, most rural parts of Greenland. Nevertheless, all three regions give a positive outlook for 2023, mainly founded on optimism. In Lapland, new binding national land use objectives will include conditions for climate change adaptation that is likely to have a positive effect.

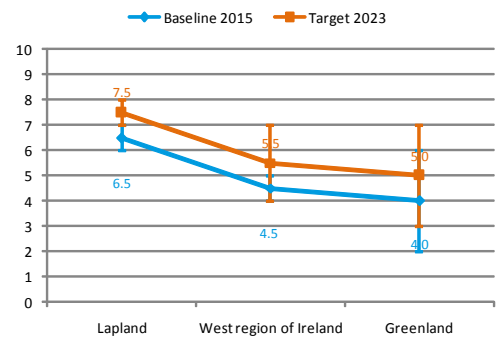
**Fig. 32:** Regional baselines and targets for Indicator 1 ‘Degree of horizontal integration and coordination’ and Indicator 2 ‘Degree of vertical integration and coordination’ [0; 10]



Regarding engagement in international cooperation on climate change adaptation, all three regions diagnose a strong interest and involvement in international project collaboration. Nevertheless, all three regions unanimously affirm that this engagement is often driven by committed individuals, which explains the large from-to range in which they situate their regions regarding international cooperation. While Lapland puts great emphasis on cross-border cooperation with Sweden, Norway and Russia on climate change (adaptation), Greenland aims to distinguish itself

internationally as a competence centre for climate change research and establish strong international relations, partly in order to strengthen Greenland’s Home Rule Government and status on the path to further independence. Generally, all three regions confirm that international cooperation builds capacities and strengthens the commitment to continue cooperating. The outlook for all regions is either stagnant or slightly positive, depending on the development of staff resources.

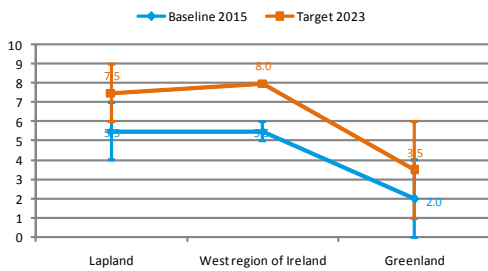
**Fig. 33:** Regional baselines and targets for Indicator 3 ‘Degree of international cooperation of local and regional public authorities on climate change adaptation’ [0; 10].



Public participation is anchored in and regulated by law in all three sample regions. In practice, however, public consultation is often implemented half-heartedly in the West region of Ireland and in Greenland: either the public is consulted too late, when plans are already too advanced to be influenced, stakeholder opinions are ignored, or procedures are not respected (e.g., reports are not translated into Greenlandic on time). In Lapland, where public hearings are a minimum requirement, the challenge relates to getting people engaged, in particular on issues pertaining to climate change adaptation, which is rather abstract and far away in time. Requirements on public participation connected to the implementation of the European Water Framework Directive are expected to improve the situation, which explains the positive forecast for Lapland and Ireland. This development might be countered by a lack of capacity at

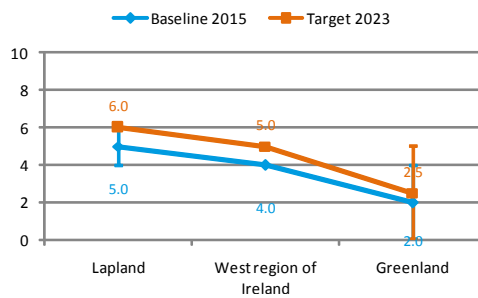
local and regional level to properly implement requirements on public consultation.

**Fig. 34:** Regional baselines and targets for Indicator 4 ‘Degree of community involvement and public participation in planning and decision-making related to climate change adaptation’ [0; 10].

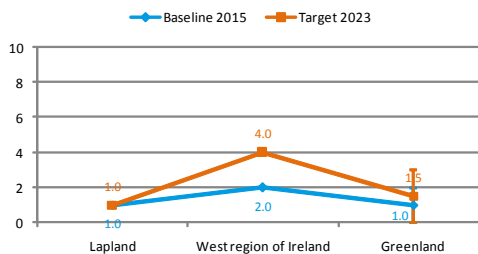


The availability of resources for climate change adaptation is strongly influenced by a region’s wealth. The generally low scores reflect budget and personnel cuts in Lapland and in the West region of Ireland. In Lapland and the West region of Ireland, funding for adaptation planning mostly comes from the European Regional Development Fund. The Irish expert considers the availability of resource in the region as ‘fairly good’, but rates the actual capacity to make use of available resources as low. In Greenland, capacities are impaired by the vastness of the country and low population density. The country lacks adaptation strategies and a proper budget for climate change adaptation. Nevertheless, due to the isolation of many settlements and towns, good local resources and capabilities have been developed that stem from the tradition of being self-reliant. Even though experts don’t expect a significant increase in financial or human resources dedicated to climate change adaptation in the coming years, their forecast is slightly positive. Lapland expects a gradual improvement over time regarding knowledge and skills in public authorities due to the ‘natural’ advancement of new public servants who have been educated on the effects of climate change.

In the context of climate change policies, the development of institutional capability



(the art of doing) and capacity (sufficient means) of regions is important to enable their participation in all aspects of climate change adaptation. The availability and reach of capacity building programmes for public authorities to gain knowledge on climate change impacts and adaptation and develop relevant skills in the area of change management, planning and modelling, etc. was rated low by all three experts. Capacity building initiatives, e.g., in the form of training, guidance, information, etc., are either inexistent or rare. The positive forecast is owed to the fact that experts expect this shortcoming to be addressed by NPA projects in the coming years.



Adaptive capacity refers not only to the ability of a system to plan for the changes (hazards and opportunities) that occur as a result of climate change in advance (anticipatory adaptation), but also its ability to respond to or cope with the effects (reactive adaptation). The West part of Ireland and Lapland focus on planned adaptation actions and measures, thus, on anticipatory adaptation. Greenland, on the other hand, seems to rely heavily on its capacity for reactive response, rooted in its tradition of self-reliant communities who, out of necessity, have developed the capacity to solve problems locally. Furthermore, decisions can be taken rather quickly in Greenland as there are not many hierarchies to penetrate.

**Fig. 35:** Regional baselines and targets for Indicator 5 ‘Availability of (financial and human) resources and capacities in local and regional public authorities to respond to climate change’ [0; 10].

**Fig. 36:** Regional baselines and targets for Indicator 6 ‘Availability and reach of capacity building programmes for local and regional public authorities’ [0; 10].

# 3. Conclusions

The baseline assessment provides the NPA Programme with a rich dataset covering various quantitative-qualitative dimensions that give a detailed and varied picture of the status quo in the sample regions as a basis for monitoring the impact of the Programme's interventions over the coming eight years. By turning the original indicators into composite indicators, compiling individual indicators into a single index, different dimensions of change will be captured, paying attention to the variations within each region. The additional collection of context information on external factors likely to affect the development of the indicators is valuable information that will help the Programme's evaluator establish a causal relationship between the impact of NPA projects and other, general developments in the sample regions.

Tab. 3 shows the composite baselines and targets. Most targets can be said to be ambitious. They predict an improvement of the status-quo until 2023 ranging from 10.6% for Indicator 3 to almost 400% for Indicator 1.2. However, targets are mainly based on the expected general trends in the sample regions rather than on the predicted impact of the NPA Programme alone.

Several lessons can be learned from this exercise regarding the use of expert assessments versus statistical data for establishing indicator baselines on NUTS 3 level. While expert assessments are inherently subjective, reflecting the personal opinions, experiences and

even work satisfaction of the individual assessor, they provide, at the same time, very instructive information about the current regional situation beyond information published in official reports or statistical data retrieved from national statistical offices. Regional experts are 'insiders' that have a tacit knowledge of the state of the region, e.g., regarding the level of internationalisation of regional SMEs, and well-established links with the Programme's end beneficiaries (e.g., regional SMEs). Building on the 'self-assessment' of a regional 'insider', this method is well-suited for recording the 'relative' change over time (improvement or worsening of the status-quo), but not necessarily adequate for benchmarking regions. Potential problems arise from the limited comparability of consecutive assessments if the assessor changes from one assessment to the next, which should be avoided if possible. On the other hand, the experience with Indicator 3 on the 'energy performance of the regional residential and public building stock' shows that obtaining statistical data on NUTS 3 level is very time-consuming and challenging due to the limited availability, accessibility and comparability of data. Differences in availability, timeliness and spatial disaggregation of data limit their accuracy and comparability, a fact that is masked by the seemingly exact values obtained. Whether either of the methods is able to measure the impacts of the programme, beyond anecdotal evidence, remains to be seen.

**Tab. 3:** Summary table of baselines and targets (normalised to show the aggregated increase until 2023).

		2015	2017	2019	2023
Indicator 1.1:	Degree of transnational collaboration between SMEs and R&D	100.0	109.0	129.2	181.7
Indicator 1.2:	Awareness and attitudes among health professionals towards the use of eHealth technologies	100.0	134.7	199.4	388.6
Indicator 2.1:	Conditions for start ups in remote and sparsely populated areas	100.0	103.6	111.7	132.7
Indicator 2.2:	Awareness of the business opportunities beyond local markets	100.0	104.3	114.1	139.5
Indicator 3:	Awareness of energy efficiency opportunities and renewable solutions in housing sector and public infrastructures in remote and sparsely populated areas	100.0	101.2	104.0	111.1
Indicator 4:	Preparedness of responsible authorities in remote, sparsely populated areas for environmental management in relation to climate change and impacts of new investments in the exploitation of natural resources	100.0	103.4	111.2	131.3



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