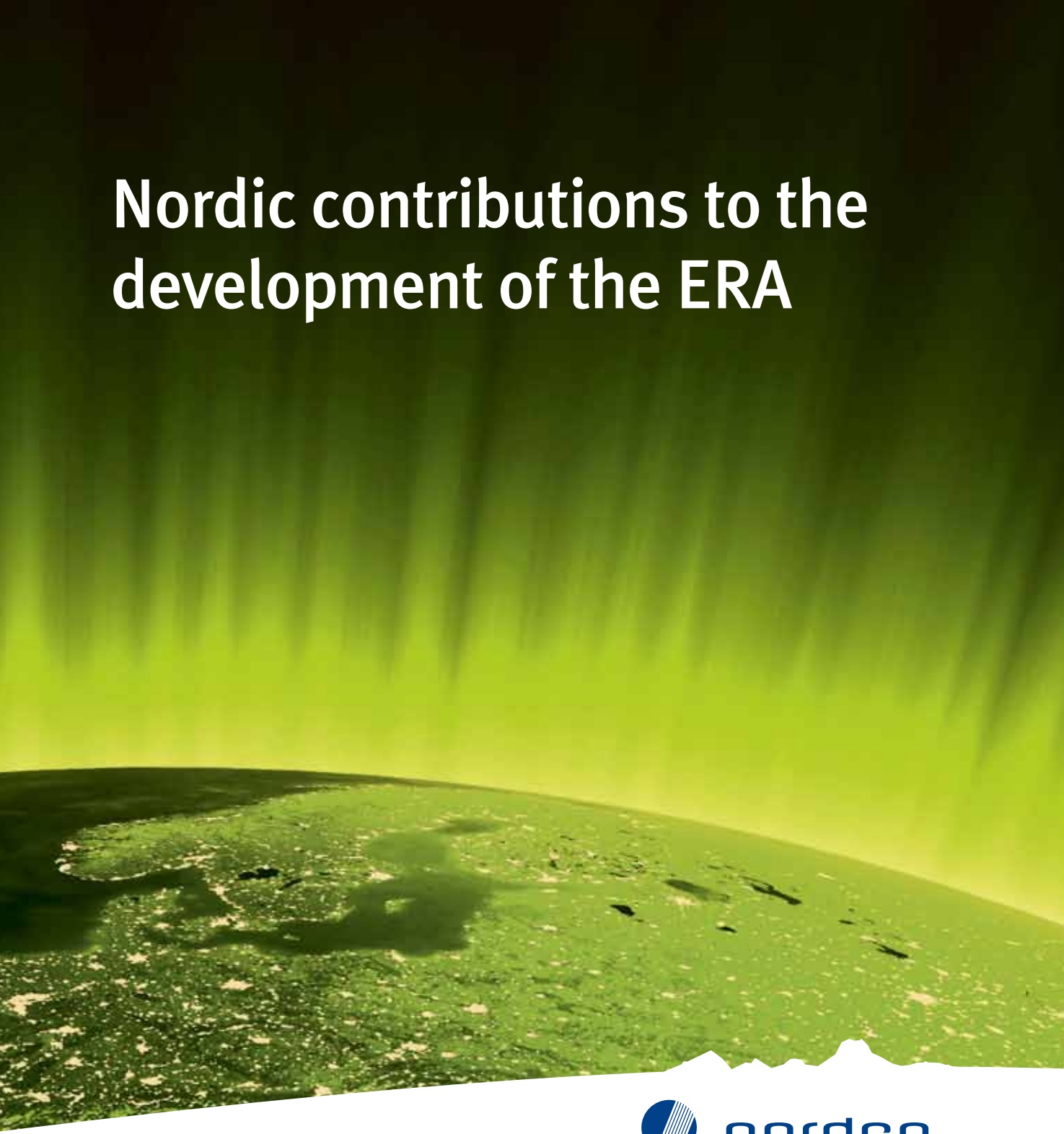
Nordic contributions to the development of the ERA



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Nordic contributions to the development of the ERA

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TABLE OF CONTENTS

PREFACE

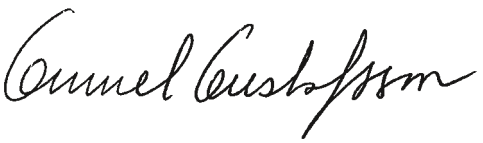
NordForsk is a platform for joint Nordic research and research policy development. Our aim is to contribute to the development of the knowledge society in the Nordic region, and consequently to a globally competitive European Research Area (ERA). To implement this, our strategic actions are inter alia developing the knowledge basis for sound Nordic research- and research policy coordination, and promoting cooperation that adds value to national initiatives in the Nordic region.

The main framework for research priorities in Europe are set in the EU, and EU research policy has wide-ranging implications for Nordic researchers and policymakers. Participation in EU research cooperation is therefore a main political priority in all the Nordic countries. The EU Framework Programme for Research and Technological Development (FP7) is, for the time being, the main instrument to respond to Europe's needs in terms of growth and European competitiveness. FP 7 covers the entire range from basic to applied research, and represents a key pillar in the establishment of the ERA. This represents substantial opportunities for Nordic researchers. At the same time, the size and complexity of FP7 represents challenges for actors from small countries, when it comes to influencing relevant decision-making processes and mobilizing sufficient resources to fully participate.

Against this background, NordForsk has commissioned three reports to describe and analyse key aspects of Nordic research cooperation in a European context, both at the research policy and – strategy level (research responsible ministries and research councils) and the research-performing level (researchers, universities and institutes). The reports have all been developed by NIFU-Step and Technopolis in cooperation with NordForsk. This second report looks into the interactions between national, Nordic and European research policies, in light of Nordic priorities regarding internationalisation of research cooperation.

I would like to thank the authors (Göran Melin and Tommy Jansson from the Technopolis group, and Inge Ramberg, Lisa Scordato and Aris Kaloudis, coordinator, from NIFU), as well as the rest of the project group[I] for the work on this report. Let me also express special thanks to the Advisory Board[II] for their very valuable input to the reports.

Oslo April 2011



Gunnel Gustafsson
Director NordForsk

I Erik Arnold (project manager), James Stroyan, Göran Melin and Tommy Jansson from the Technopolis group, Aris Kaloudis, Inge Ramberg and Lisa Scordato from NIFU. Marianne Røgeberg has been NordForsk's main responsible for the project.

II Carl Jacobsson (Swedish Research Council), Unni Nikolaysen (Norwegian Minstry of Research and Higher Education), Hans M**ü**ller Pedersen (Danish Agency for Science, Technology and Innovation), Eili Ervela-Myreen (Finland)

EXECUTIVE SUMMARY

This is the second in a series of three Policy Briefs that explore the relationship between Nordic and European-level R&D cooperation policies from the perspective of the Nordic countries. In particular, this Policy Brief investigates the experiences, role and potential of the Nordic research system in the context of the European Research Area (ERA).

Common Nordic challenges

A challenge common to all Nordic countries is the need to contribute to and profit from the shaping of the ERA, with its new European R&D governance structures such as ESRFI initiatives, the Joint Programming Initiatives (JPIs), Article 185 (ex Art. 169) and Article 187 (ex Art. 171) initiatives, the new Public-Private Partnerships (PPPs), the European Institute of Innovation and Technology (EIT) and so forth. With the growth in the size of the Framework Programmes and the increasing use by the Commission of large-scale instruments involving self-organisation by stakeholder groups, small countries and regions are facing new challenges in relation to their future position and role in the European research system. It is therefore especially important to determine the best way to organise national Nordic participation – especially as there are strong indications that FP8 will represent a discontinuity with the past with regard to its content and the rules of the game, and therefore the way in which added value is created.

The wider policy effort to create the ERA involves building critical mass in research – fewer, bigger and more globally competitive centres and networks. This increasingly 'common market' in research and knowledge services (the 'fifth freedom') will involve a need for increased specialisation and division of labour. In fact, it also means a shift in the concept of 'European Added Value' from a definition based essentially on the networking of research groups to one based on overall European interests (which may not always be the same as national or Nordic interests).

National and regional (Nordic) strategies have to adapt to this reality and *selectively* foster Nordic areas of excellence in research and technology – excellence that needs to be extended from the research-performing organisations to other parts of the knowledge system, including education, training and skill-building. This, together with the broad scope of the 'Grand Challenges' such as climate change, the ageing population, energy safety and sufficiency, food and water supplies, HIV/AIDS, pandemics, and security and development implies a need for holistic or 'linked' policies, not only within the sphere of research and innovation but also on a broader scale. Knowledge policies will never be more than partially effective unless there is systematic coordination between their main components, i.e. research, innovation, education, labour markets, infrastructure and industrial policies. This is the reality that NordForsk, the Nordic Council of Ministers and the entire Nordic policy governance structure must adapt to and on which their future activities must be based. It is time to (re)consider how to build robust Nordic knowledge policies in the context of the Lisbon Treaty and the ERA.

Three clusters of policy questions

This Policy Brief covers three broad clusters of issues, which together are associated with the main question: "How can the Nordic region use its experience with research cooperation to contribute to the development of, and to profit from, the ERA?" These three clusters of issues are:

- What has been the experience of Nordic policymakers with regard to the shaping of research agendas within the EU?

- What has been the experience of Nordic researchers with regard to their participation in

the FPs, particularly with the new instruments under FP7 and with the shaping of research agendas within the EU?

- What is the future potential for Nordic research policymaking in the context of the ERA?

Nordic governance in the context of the ERA

The Nordic region probably has more experience with international research governance than any other region in the world, and has established cooperation mechanisms among ministries and agencies alike. The EU agenda of developing a European Research Area, announced in 2000, provided a significant stimulus to Nordic cooperation and led to the idea of a Nordic Research and Innovation Area (NORIA). A recent study (TemaNord 2006: 576) of the opportunities for more open research and innovation funding among the Nordic countries found that:

> *NordForsk and NICe are the current institutional pillars in the Nordic system for discussing and implementing research and innovation policies at the Nordic level. NordForsk is a very recent creation and has yet fully to find its form, but promises to bring together the research councils and build upon the work of the established NOS committees. However, NordForsk and NICe live in different ministry fiefdoms (Education and Industry, respectively)... There is no common governance or coordination channel. The Nordic level therefore lacks key ingredients of good research and innovation governance practice that would be necessary to develop the holistic research and innovation policies, which the Nordic states individually see as crucial to good performance. There is little strategic intelligence available that is structured at the Nordic level, so the ability to assess needs and design interventions is correspondingly limited. Crucially, their overall size is very modest – possibly even under-critical for performing a significant international role. As they stand, these structures do not have the mechanisms or the defined role that would be needed to coordinate the kind of bottom-up cooperation initiatives that historically have resulted in successful Nordic cooperation and that could in the future create the joint programmes and platforms that will strengthen Nordic actors in the Nordic and international R&D arenas.*

These views are also largely shared by the majority of the high-level policymakers we interviewed in the Nordic countries. In fact, many of them are aware of and puzzled by the low volume and modest reach of Nordic R&D policy collaboration, given the common challenges that all the Nordic countries face and given the strong ties – political and cultural – between them.

The prevailing view is that the potential for exploiting the advantages inherent in Nordic cooperation to achieve global excellence in selected areas of research and innovation is vast for all the individual Nordic countries. Yet, the volume and speed at which new ERA initiatives are being created – within and outside of FP7 – are so overwhelming for public administrators in small (and larger) countries and for research communities that there is little time and energy left to consider how best to reposition Nordic-level cooperation in between the national and EU levels.

Obviously this *de facto* and unintended shortage of time and energy at the national policy level leads neither to an optimal organisation of the overall Nordic R&D collaboration nor to an optimal degree of exploitation of whatever synergies may exist in more systematically merging Nordic interests and positions in the context of the ERA.

Findings and recommendations

The researchers we interviewed, all of whom were experienced participants in FP6 and FP7, were aware of NordForsk and considered Nordic research funding to be more flexible and

much easier to administer than FP funding. Their main disappointment was the small scope and scale of Nordic collaboration schemes, an opinion which in many aspects (and paradoxically) coincides with the opinion of national research policymakers. However, many interviewees did not know what the overall direction and rationale of current Nordic research policies are, and they were unfamiliar with NORIA as a concept.

Nevertheless, researchers as well as policymakers appear to share a common, pragmatic view of the value of Nordic research collaboration: Nordic research collaboration should promote the overall competitiveness and positive impacts of the research efforts in the Nordic region, either by strengthening the Nordic presence in the ERA (including the FPs), or by positioning Nordic research at the forefront of the knowledge frontiers, or by pooling Nordic efforts to address the Grand Challenges. Some even argued that the ultimate goal of Nordic policy collaboration should be to create an effective common Nordic knowledge area *per se* (but, of course, within a European context).

NordForsk should therefore continue to be involved in shaping effective arenas, thus facilitating better realignment of the national, Nordic and EU research systems. This is true both for the research policy level (ministries and agencies) and for the R&D organisations which increasingly seek to optimise the positive effects of their international activities and networks and minimise the related costs.

The real mission of Nordic research collaboration policies lies in the medium to long-term coordination of national ERA policies in the Nordic region with the objective of increasing the efficiency and effectiveness of national efforts related to participation in the ERA by exploiting Nordic strengths and synergies. This is a view previously expressed by others, i.e. NORDERA report (2010) and Andrée (2009). The objective of shaping and expanding the ERA in the Nordic region is also perfectly compatible with the more ambitious and all-encompassing vision of creating an effective common Nordic knowledge area *per se*.

Be that as it may, the additional point we want to stress here is that the Nordic research governance structures are better suited to developing NORIA in the context of the ERA than to attempting to shape Nordic participation in and through the Framework Programmes. The interviews we carried out leave little doubt that 'petit Nordic policy coordination' of Framework Programme policymaking (i.e. coordination of Nordic positions at the level of work programme committees) is not how NordForsk should invest its scant resources and energy. At best, coordination of Nordic positions at this level takes place ad hoc through formal and informal, self-organised processes.

Instead, Nordic research collaboration policies appears to have a considerably more strategic role to play in a medium to long-term perspective, where the objective should be to pool national ERA participation efforts to:

- achieve better integration of research and higher education activities in the Nordic region;
- identify common Nordic interests and positions for future research infrastructures and joint programming initiatives in the context of the ESFRI and JPIs, as well as stand-alone Nordic initiatives;
- design a set of instruments and policies allowing not only greater researcher mobility but also greater division of labour across universities and colleges in the Nordic countries;
- draw up thematically differentiated strategies for a more coordinated approach towards research collaboration with third countries, that is, countries outside of the European Economic Area (EEA), in particular the BRIC countries.

Of course, well-functioning bottom-up arenas for formal and informal intra-Nordic research coordination already exist, most notably the annual meetings of the Nordic Research Council

Directors (NORDHORCs) which are often held prior to the meetings of EUROHORCs, which is the EU counterpart of NORDHORCs. Yet, at the moment these mechanisms do not seem powerful enough to exploit the full potential of Nordic research collaboration.

The NORIA-net initiative, a variant of the ERA-NET instrument employed under FP6 and FP7, is exactly the type of flexible initiative that will allow well-considered, systematic and sound planning of future integration and empowerment of the Nordic research system with shared funding at the national and Nordic levels (see e.g. the NORIA-net 'Nordic-Asian Research Funding Cooperation'). In addition, other Nordic instruments such as networks of national research schools, Nordic Centres of Excellence, the 17 actions currently funded as joint Nordic use of research infrastructures, etc., are examples of sensible policies in the context of the ERA. The key question in this respect is how to optimise the scale and scope, as well as the combination of these policy instruments. To answer this question it is important first to distinguish between short, medium and long-term policy objectives and then to conduct better, more detailed analyses of the priorities and policy needs of the individual Nordic countries.

From this perspective the Top-level Research Initiative (TRI) is an important learning arena in Nordic research policymaking. Other possibilities could also be explored in the near future; one of the most intriguing of these is the opening up of national R&D programmes for Nordic collaboration schemes. The NORIA-net initiative is likely the best instrument for exploring these possibilities.

The interviews also revealed a number of thematic areas that hold realistic potential for greater joint Nordic R&D efforts similar to the Top-level Research Initiative. In addition to the fields of energy and climate, these are:

- research in and for the Arctic and Baltic regions;
- clinical research based on the competitive advantage derived from the well-developed health registries and biobanks available in the Nordic countries;
- research on the improvement and Nordic benchmarking of health care;
- forestry research;
- marine and maritime research;
- various research infrastructure projects;
- specific topics within the social sciences and humanities, especially research on welfare systems and their organisation.

Having said this, from a short term perspective one must not preclude the need for support measures for Nordic participation in FP7. A number of researchers we interviewed expressed a need for Nordic funding schemes that could bring together Nordic partners within EU consortia or within other international R&D collaboration schemes. One of the criteria for awarding such 'proposal glue-funds' should be a demonstrated ambition and ability to lead global-scale research. This is probably an argument for refocusing and strengthening NordForsk's portfolio of instruments. METOXIA, one of the largest projects funded so far under FP7, provides a good example of a large, influential European research network which started as a Nordic collaboration initiative about 15 years ago with support from Nordic research funds.

Furthermore, in research areas where FP funding is marginal or absent, it is clearly in the national interests of the Nordic countries to devise joint internationalisation strategies. Scientific fields such as the social sciences and humanities, law, the arts, education in the professions, etc. are areas where the potential and probably the added value would be increased if they were better integrated within the Nordic region and exposed to international collaboration and competition. A new type of NORIA-net initiative, adjusted to particular needs and to these areas of research and education, could be a helpful instrument.

With regard to the *utilisation* of research results from international collaborative R&D efforts, there seems to be a policy void on this matter at the EU, Nordic and national levels. In light of the 'Innovation Union' flagship[1] this may change in the near future. Either way, from a Nordic perspective this is an area where Nordic agencies such as NordForsk and the Nordic Innovation Centre (NICe) could play a role, but this would entail setting a new course in the mandates of both organisations as well as allocating resources to common activities designed to leverage the synergies that may exist between these two organisations in the future. Also here, the EU provides models and examples of the types of instruments that could be applied for this purpose, namely Nordic variants of Joint Technology Initiatives, the EUROSTARS programme (a flexible measure designed for research/innovation-intensive SMEs), the Risk Sharing Finance Facility (RSFF) and possibly Nordic variants of Knowledge and Innovation Communities (KICs). The latter could help to develop better, closer inter-Nordic collaboration links between large companies and universities throughout the Nordic region and within specific thematic areas of importance to the Nordic region.[2]

Due to recent policy developments in the EU and, especially in light of the clear shift in rhetoric on EUs research policy which now explicitly incorporates a much wider innovation perspective, NordForsk should proactively carry out studies on how knowledge generated from Nordic, EU and other international research activities is, or can better be, exploited (e.g. commercialised or accumulated in innovation processes) within and by the Nordic region. There is clearly a need to increase the awareness of the innovation potential associated with international collaborative R&D projects.

Finally, it is clear that much could be done to increase the visibility of Nordic research and innovation policies among Nordic researchers. Our interviews suggested that basic research scientists know about and have a good opinion of NordForsk's activities, while more applied and innovation-oriented researchers are less aware of the activities of both NordForsk and NICe.

1 The EU flagship initiative 'Innovation Union' aims to improve framework conditions and access to funding for research and innovation so as to strengthen the innovation chain and boost levels of investment throughout the EU.

2 All these ideas have been mentioned and further elaborated on by at least two interviewees from at least two different Nordic countries.

1. INTRODUCTION

As part of the effort to strengthen the European Research Area (ERA) and European competitiveness, the volume and complexity of the Framework Programmes (FPs) have increased considerably. The EU Seventh Framework Programme (FP7) covers the entire range from basic to applied research and is a key element in the further development of the ERA. In particular, many new research policy instruments were launched under FP7, such as the JTIs, several Article 185 (ex Art. 169) initiatives, the Knowledge and Innovation Communities (KICs) under the European Institute of Innovation and Technology (EIT), etc.

Two newly-published reports, the NordForsk report entitled "International Research Cooperation in the Nordic Countries" and the NORDERA report on "Formalised and non-formalised Nordic research and innovation cooperation", constitute the most recent analytical backdrop for all three Policy Briefs that NordForsk is publishing in 2010. The first report is a comprehensive bibliometric study of the production of research publications and research cooperation patterns in the Nordic countries. The study indicates that:

- From a global perspective, Nordic research is highly competitive and highly internationalised, as half of all papers published by Nordic researchers are written in collaboration with researchers from other countries; the production of scientific articles by Nordic researchers and scientists during the last 20 years has increased significantly in all five Nordic countries; in the period from 2004 to 2007 all of the Nordic countries were among the world's most cited countries, ranging from Denmark in fourth place to Finland in eleventh place.
- As a result of their relative size, the Nordic countries collaborate mostly with each other (measured on the basis of co-authorship counts), while collaboration between Nordic and North American researchers is more extensive than collaboration between Nordic and other European researchers. The latter finding is rather surprising, given the presence of such powerful European research collaboration mechanisms as the FPs and compared with the more limited availability of public funding in the Nordic countries for collaboration with US researchers.

The NORDERA report provides a detailed analysis of the formalised and non-formalised Nordic research and innovation cooperation which aims to: *"identify good practices on research and innovation programme coordination and assess how lessons learned can be of value for the further development of both the ERA and NORIA as an integral part of ERA"*.

Policy Brief 2010-1 investigated Nordic participation in the EU FPs by analysing European Commission (EC) participation statistics for FP6 and FP7 (known as E-CORDA data) and by surveying Nordic participants in FP6 and FP7. Key findings of particular relevance for the themes explored in this second Policy Brief 2010 are as follows:

- Due to their size, the Nordic countries collaborate mostly with each other in FP6 and FP7 (measured on the basis of co-participation counts).
- Nordic coordinator rates are above the overall averages for FP6 and FP7 and the amount of EC funding per participation is higher for the Nordic countries than the averages for FP6 and FP7.
- Nordic involvement in the newer initiatives, such as the JTIs, PPPs, and Article 185 (ex Art. 169) initiatives, is strong, but the overall awareness of these new initiatives is rather low.
- Survey results of Nordic participants reveal that many respondents believe that a Nordic strategy for FP engagement should be developed. This should be based on areas of Nordic strength and go hand-in-hand with better alignment between national, Nordic and EU-level funding and support.

MAIN QUESTIONS INVESTIGATED IN THIS REPORT

To supplement the work carried out for Policy Brief 1 and the NORDERA ERA-NET Support Action (see "Lessons Learned from Nordic Research Cooperation in the Context of the ERA"), the present report analysed the Nordic experience with the FPs, in particular with the new ERA instruments under FP7 and the role that Nordic research cooperation plays or may play in the future. In particular, the report investigates the following questions:

- What are the main elements of the Nordic countries' national strategies for internationalisation of research? What is the role of the FPs and Nordic cooperation in these strategies?
- What is the willingness and ability of Nordic research policymakers to view national and Nordic priorities in a larger European context?
- What are the contributions of Nordic policymakers to EU decision-making on the development and adoption of the Framework Programmes, as well as on the development of the work programmes?
- How do the three levels of the Nordic research system interact in terms of efforts to follow up the EU research programmes at the national level and to provide the European Commission with relevant national and Nordic viewpoints (through programme committees, coordinating committees, advisory boards, expert groups, etc.)?
- What is the degree of consistency between main EU research priorities and national research policy agendas in terms of thematic priorities as well as horizontal issues (interdisciplinarity, international orientation, business participation, etc.)?
- What has been Nordic participants' experience with the Framework Programmes?
- What is the experience with the governance of research cooperation in the Nordic region?

Normally, a Policy Brief dealing with these questions would begin the analysis with an introductory chapter on Nordic cooperation and its governance. However, the NORDERA report provides an excellent and sufficiently detailed account of the history of Nordic cooperation and its governance structures, and gives an account of how the concept of NORIA has been conceived, received and operationalised so far. Furthermore, the NORDERA report briefly presents the main policy governance organisations such as the Nordic Council of Ministers for Education and Research (MR-U), the Nordic Council of Ministers for Business, Energy and Regional Policy (MR-NER), NordForsk, NICe, Nordic Energy Research, the Nordic Centre for Spatial Development (Nordregio), etc. The report also provides an assessment of the Nordic institutional framework landscape, which is generally found to be unnecessarily complex, insufficiently coordinated and vertically compartmentalised. Thus, there is no point in repeating such accounts here, and we advise our readers to consult the NORDERA report if they are interested in an updated description of Nordic research and innovation policy governance. Likewise, presentations and broad analyses of national research and innovation systems in the Nordic region can be found in the ERAWATCH and PRO INNO TrendChart reports.

Thus, Chapter 2 of this Policy Brief begins with an account of the Nordic countries' strategies for internationalisation of research, in which we investigate how comprehensive and sophisticated these strategies are (should they exist) and how they are interlinked with the overall national research and innovation priorities. As we explain in the next section, the discussion in Chapter 2 is based mainly on official national policy documents and interviews with Nordic policymakers and experienced participants in FP6 and FP7. We provide an account for each one of the five Nordic countries and conclude with a short paragraph summarising aspects that the entire Nordic region has in common. We use the same structure in all subsequent chapters as well to present the results from our interviews.

Chapter 3 deals with bullet points 2 and 4 above and summarises responses from the Nordic

policymakers we interviewed (see Part 1 of the interview guide in Appendix 1).

Chapter 4 summarises the experience of Nordic researchers with research activity under the Framework Programmes and with Nordic collaboration in their consortia, and we summarise their opinions on national and Nordic policy choices and options in the context of ERA instruments under FP7 and beyond. In Chapter 4 we also juxtapose opinions of Nordic researchers with the opinions of Nordic research policymakers.

Chapter 5 summarises the views of Nordic policymakers on how Nordic collaboration schemes could be developed for use as policy tools in relation to the ERA, while Chapter 6 provides an account of future options for Nordic research cooperation based mainly on the responses received in Part 3 of the interview guide (see Appendix 1).

Chapter 6 also constitutes the natural point of departure for the third Policy Brief which investigates the concept of 'Nordic Added Value' as opposed to 'Added value by Nordic research cooperation in the context of ERA and of the current discussions on the Eighth Framework Programme'.

An overall assessment of the findings in Chapters 2-6 and our own interpretation of the interview material with recommendations to Nordic research policymakers are provided in the Executive Summary above.

METHODOLOGY

The main methodological approaches used to answer the questions raised in this Policy Brief are as follows:

- desk research to analyse national priorities in the Nordic countries regarding EU research coordination and the degree of consistency between main EU research priorities and national research policy agendas;
- a set of semi-structured interviews with 44 policymakers (ministries, research councils and EU offices) in the Nordic countries;
- a set of semi-structured interviews with 41 participants from the Nordic countries in FP6/FP7 and in the new FP7 instruments (ERA-NETs, ERC projects, JTIs, Article 185 (ex Art 169) initiatives, etc.).

Information from these three sources has been summarised both by country and for the Nordic region as a whole in order to provide a state-of-the-art picture of current thinking and attitudes towards European and Nordic research policymaking in the Nordic research system and within a wide range of aspects of Nordic participation in EU-funded research. The information from research policy documents on the internationalisation of national R&D strategies and national research priorities have been discussed, including with most of the Nordic policymakers during the interviews, in order to improve the degree of consistency and precision of the desk research analysis.

This Policy Brief provides the reader with a state-of-the-art document on current Nordic perceptions regarding Nordic and EU research policymaking, aggregated at the individual country level and for the Nordic region as a whole (see Chapters 2-6). In the Executive Summary the authors of this Policy Brief present their understanding of the policy implications of this rather extensive and unique interview material. This forms the empirical basis for their policy recommendations to NordForsk and Nordic research policymakers.

Criteria for selection of the interviewees

The main criterion for *selecting Nordic policymakers* as interviewees was that they had to have broad experience with national and/or Nordic research internationalisation policies. Typically, our interviewees worked in research agencies, such as the Research Council of Norway, the

Icelandic Centre for Research (RANNIS), the Swedish Research Council, the Finnish Academy of Science and Letters, or innovation agencies such as VINNOVA or Tekes and/or responsible national ministries. All the policymakers interviewed had a very good overview of EU research policies and good knowledge of FP6 and FP7. They were familiar with Nordic research collaboration and Nordic research policies and many of them have also had working experience with third-country international collaboration schemes and/or European intergovernmental cooperation. At least three interviewees were active participants in ERAHORCS or NORDHORCs or both.

TABLE 1. THE DISTRIBUTION OF THE NUMBER OF INTERVIEWEES BY COUNTRIES.

	Nordic participants in FP6 and FP7 (including new initiatives under FP7)	Nordic policymakers	Total
Denmark	8	8	16
Finland	11	7	18
Iceland	3	4	7
Norway	9	13	22
Sweden	10	10	20
Nordic	-	2	2
Total	41	44	85*

*) Six interviewees represented both groups as they were both policymakers and participants in ERA-NET projects. The total number of interviewees was therefore 79.

With regard to the Nordic participants in FP6 and FP7, the E-CORDA database was used as a starting point in the selection process. First, we identified organisations and individuals with a high level of involvement across the two Framework Programmes. Then we designed a list to ensure that there was a balanced representation of interviewees among the five countries and a good mix of representatives from universities, research institutes and the business sector. The target list of interviewees included research performers drawn from different priority areas of the programmes. Particular attention was given to selecting a sufficient number of interviewees who had experience with new instruments under FP7, i.e. the JTIs, Article 185 (ex Art. 169) initiatives and KICs.

Three different interview guides were produced, one for each of the three target groups. In total we conducted about 80 interviews. Table 1 illustrates the distribution of interviewees by country and type. In six cases, interviewees had status both as participant and as policymaker. These are policymakers who participated in ERA-NETs. The total number of interviewees was 79.

2. STRATEGIES FOR R&D INTERNATIONALISATION IN THE NORDIC COUNTRIES

In this chapter we present key points from the national strategies for European and international research cooperation in the five Nordic countries. The chapter also provides an overview of national policy design and implementation bodies with responsibilities for internationalisation strategies in the Nordic countries, and discusses their roles in the governance of the R&D internationalisation policies.

The Nordic countries as a region have extensive experience with international research governance and have established cooperation mechanisms both between research ministries and between national research agencies. The EU agenda of developing a European Research Area (ERA), announced in 2000, provided a significant stimulus for expanding Nordic cooperation, and led to the idea of a Nordic Research and Innovation Area (NORIA). EU-funded research and the EU Framework Programmes have become the most important *institutional* arena for collaboration between Nordic and international researchers.

Therefore, the questions we raise in this chapter are: what type of strategies and visions for international research cooperation are employed by national ministries and research agencies in the Nordic countries, how do these strategies relate to the new initiatives under FP7 and other ERA actions such as Joint Programming Initiatives, and what role is envisaged for the Nordic research collaboration in these strategies? The analysis is based on a number of strategy documents and white papers from all five Nordic countries.

DENMARK

Research policy has played an important role in Denmark's overall policy agenda in recent years. The last two years have seen a greater focus on research policy as well as on increased public funding of R&D.

The Danish Ministry of Science, Technology and Innovation has the overall responsibility for coordinating policies on the internationalisation of research. However, internationalisation policies are mainly developed and implemented at the respective research councils. The ministry conducts the evaluation of Danish participation in the FPs and is involved in the planning of FP8.

As a follow-up to the Globalisation Strategy (Danish Government (2006)), the Danish government launched a reform of the Danish research system. This was mainly done through the decision to incorporate the existing 11 research institutions into the higher education sector by 2007. The purpose was to establish more competitive universities and promote the international competitiveness of Danish research (Danish Government (2007)). In particular, the establishment of three large universities – Copenhagen University, Aarhus University and Denmark's Technical University – based on the merger of existing universities with sector research institutes has strengthened the research system. The three universities are expected to have clear research profiles and to serve as hubs for the main national R&D actors in their respective fields. Copenhagen University will house the main chemical and biological research performers. Aarhus University will cover a broad range of fields with a specialisation in environmental issues and natural resources, nanoscience, economics and social sciences. Denmark's Technical University has merged with five sector research institutes, e.g. the Research Centre Risø, and aims to become a leading international university for the development and application of research-based technology.

In addition, the universities are given more freedom within the framework of guidelines stipulated in 'development contracts' (*udviklingskontrakter*) between the universities and the Ministry of Science, Technology and Innovation. Under these four-year-long contracts, universities have greater freedom to select their own strategies, although future funding is dependent on the results reported.

In Denmark the international dimension has traditionally been viewed as part of the national context. International collaboration is seen as an asset, but always in the context of national needs and priorities. Strategy documents on this issue have been drawn up at the ministerial level, but these have not been widely circulated.

Denmark does not have a specific internationalisation strategy at the national level, but it has a stated goal to increase the country's economic return on participation in the Framework Programmes so that its rate of return is at least on a par with its investment. Denmark has increased its proportional participation in FP7 compared with previous FPs. The attitude towards internationalisation is positive, however, and goals are set and steps are taken to further internationalisation throughout the system, including in the Ph.D. programmes, at the universities and through research funding and support schemes. Another obvious driver is to further Danish competitiveness through researcher mobility, network activities and joint research projects. Here, growth economies and regions have been identified in a consultative process involving Danish embassies and other players.

The main drivers are still to be found at the individual level. Researchers seek international experience through mobility or collaboration, and several supportive instruments are in place.

Denmark is currently coordinating a series of Peer Learning Activities (PLA) through CREST at DG Research. Each PLA will be hosted by different European countries and will focus on central policy issues concerning research and universities in Europe: Reform of the Institutional Structure, World Class Excellence, Capacity Building, Young Researchers – Recruitment and Career, Costing of Research Projects. The outcome and the working method of the PLAs will be evaluated at the end of 2010.

The Ministry for Development Policy (under the Danish Ministry of Foreign Affairs) administers a programme that supports developing countries through researcher mobility as a means of building capacity in these countries. The Danish Ministry of Education does not focus on these countries in the same way, but rather on those that are already relatively more advanced, such as China and Israel.

Denmark makes a clear distinction between bottom-up research on the one hand and strategic research on the other. The Danish Council for Independent Research (*Det Frie Forskningsråd*), which is responsible for researcher-driven research, is an umbrella organisation encompassing five 'sub'-research councils: the Research Council for Culture and Communication, the Research Council for Nature and the Universe, the Research Council for Society and Trade, the Research Council for Health and Illness, and the Research Council for Technology and Production. These councils do not manage research programmes in the classical sense.

The Council for Strategic Research (*Det Strategiske Forskningsråd*) administers strategic research programmes in areas of political priority. It funds research projects and gives advice to applicants, as well as promotes increased university-industry collaboration.

There is also the independent Danish National Research Foundation (*Danmarks Grundforskningsfond*), which funds research of a high international standard.

All these councils have their own more or less developed strategies for collaboration. These obviously also involve international issues, and the Ministry of Science, Technology and Innovation hopes to assemble these councils and agree on a division of labour. In this respect, Denmark has an advantage since the various councils have a joint secretariat, which makes coordination more feasible.

There may be some overlap between the people in charge of international issues in the various ministries, and for this reason a coordinating body has been established. This 'VTU-politisk Center' is placed under the auspices of the Ministry of Science, Technology and Innovation, and is responsible for the coordination of national and international research issues.

The government strategy for Denmark in the global economy, "Progress, Innovation and Cohesion", was the result of dialogue and a consultative process in which a Danish Globalisa-

tion Council was specifically set up by the government.

The ministry has now launched a campaign targeted at FP8 to ensure that the process includes all stakeholders. The main driver behind this open consultation is to establish a better foundation for decision-making.

There are a number of instruments available, starting with those under the EU. The National Contact Point network is an important provider of advice and individual assistance in Denmark (as they are in all Member States and associated countries). The Euro Center offers consulting services to applicants, and both the Euro Center and the research-funding bodies award grants for preparation of applications to the Framework Programme.

Denmark has a number of bilateral research agreements, which is another important internationalisation instrument. These agreements have been signed with non-EU countries that Denmark considers to be interesting partners for collaboration (such as Japan). Research grant agreements to promote researcher mobility are in place with prestigious universities such as the University of California, Berkeley, and Stanford University.

Innovation Center Denmark is a relatively recent form of cooperation between the Ministry of Foreign Affairs (the Danish Trade Council and Invest in Denmark) and the Ministry of Science, Technology and Innovation, and it is a tangible outcome of the national globalisation strategy. Innovation Center Denmark links companies, investors and research and innovation communities in Denmark and the Silicon Valley, and representatives from the ministries would like to see further development of this initiative.

The European Structural Funds play only a minor role in the Danish research system, but they have some impact on regional business development, especially in relation to environmental protection and education and training. Denmark is an active member of the European Space Agency (ESA) and the European Southern Observatory (ESO), both important organisations in the field of space science. Denmark also collaborates within the COST and EUREKA frameworks.

Still, there is no specific document defining an overall strategy for the internationalisation of Danish research. Internationalisation policies are included in general research policy and in the Danish Government's Globalisation Strategy. Denmark's orientation towards the EU and FPs appears to be strong. With regard to its position on FP8, Denmark may argue for opening up the programme to more third countries. There is also a positive attitude towards the Nordic Top-level Research Initiative. Infrastructure and mobility are seen as important aspects of the FPs that should be maintained. At the EU level, traditional academic parameters are used to analyse the quality of research. At the Nordic level, no concrete indicators seem to be used in any systematic fashion.

FINLAND

As early as November 2004, the Finnish Science and Technology Policy Council[3] adopted a strategy for the internationalisation of Finnish science and technology. Since then, much has happened nationally and globally regarding the internationalisation of Finnish research. In light of this, the Research and Innovation Council decided it was necessary to garner insight from the experiences of the various players, and it revised the internationalisation strategy document in 2009. The objectives and policy guidelines in this new document relate to the period from 2010 to 2015.

3 The Research and Innovation Council, chaired by the Finnish prime minister, advises the Government and its ministries on important matters concerning research, technology, innovation and their utilisation and evaluation. The Council is responsible for the strategic development and coordination of Finnish science and technology policy as well as of the national innovation system as a whole. The Science and Technology Policy Council of Finland became the Research and Innovation Council in January 2009.

Assessing internationalisation in Finnish economy and society

Contrary to what is commonly believed about the Finnish research system, the new internationalisation strategy states that the rate of internationalisation of Finnish research is relatively low compared with Finland's major partner countries and competitors. This necessitates measures to enhance internationalisation and establish strategic guidelines for development. There are indications that the degree of globalisation of the Finnish economy is rather low, and most probably below other Nordic countries (Vujakovic, 2009). Furthermore, there are signs of asymmetric openness in both economic and social globalisation. Inward investment is lower than outward foreign direct investments (FDI), immigration is low, and the number of international students and researchers is relatively small. Although the number of Finnish researchers in relation to the workforce is the highest in the world, Finland is among the few countries – together with Mexico, South Korea, Italy, and some central Eastern European countries – which have experienced a net loss of individuals with a tertiary education (OECD, 2008). This issue of 'brain drain' is in fact highlighted as a main challenge in the internationalisation strategy document: "The challenges of internationalisation are various. Finland is one of the few OECD countries to experience brain drain. In mobility, Finland is lagging behind others. University teachers' and researchers' visits abroad have decreased in the 2000s. Although there are a large number of degree programmes given in foreign languages, Finnish higher education institutions have not gained a foothold in the rapidly growing global education market." Another key challenge mentioned in the internationalisation strategy is *demographic change*, the ageing population and the availability of a skilled work force, as well as the question of how to safeguard the quality and supply of welfare services. Furthermore, the working-age of the population is predicted to decrease in almost all regions of Finland in the 2010s.

A holistic internationalisation strategy

The strategy document states that internationalisation must be promoted as part of the overall development of Finnish education, research and innovation (ERI). The strategy proposes to incorporate internationalisation policies into *all* ERI development and decision-making. International cooperation must be an integral part of all Finnish ERI activities. In a global economy, where there are no purely national environments anymore, it is essential to make efficient use of global education, research and innovation collaboration links and to introduce incentives to support them. Interestingly, the strategy claims that "success in internationalising ERI also entails comprehensive action in society to promote openness in the living environment and genuine internationalisation in everyday life and in ways of working and creating new things" (Research and Innovation Council of Finland 2009).

Moreover, the aim of internationalisation strategies is to support Finland's own growth and development, step up bilateral cooperation with its foremost partner countries and regions and improve the capacity for solving common, trans-border problems. Priority is given to fields in which Finland has high-calibre, specialised knowledge and development potential while "cooperation areas and regions must be selected proactively". In multilateral cooperation, Finland's objective is to seek to influence both the content and objects of cooperation (e.g. the FPs). Finnish business and industry and research organisations should be encouraged to more actively seek cooperation with the "foremost international organisations and leading ERI countries" (see Research and Innovation Council of Finland 2009).

Infrastructure policies

Until recently, Finland's participation in international infrastructures and ESFRI projects was rather limited. This was interpreted as a worrisome weakness of the Finnish research system and, therefore, the strategy recommends pursuing a more ambitious "long term infrastructure policy and strengthen[ing] cooperation between national and international organisations on

a wide scale". In order to promote these objectives the strategy proposes the establishment of a national research infrastructure body which should be allowed sufficient operational scope of action and provided with adequate financing.

Stronger focus on global interactions

The strategy suggests that Finnish companies and research organisations must more actively seek to enter into long-term interaction with leading research and innovation regions and actors. This means that more attention needs to be paid to public and private research and innovation activity *outside of the EU*. Hence, national cooperation must be expanded with a view to strengthening internationalisation. The agencies facilitating internationalisation, such as Finpro, Invest in Finland, Tekes, the Academy of Finland, Sitra, the foreign office permanent representation network, etc., must jointly contribute to the coordinated promotion of bi-directional international cooperation within their remits. Target areas to be prioritised are the FinNode[4] countries, the foremost countries with bilateral agreements with Finland and emerging economies in Asia, the Americas and Africa, such as South Korea, Brazil, Chile and South Africa.

European cooperation

Finland is a net recipient in R&D financing in the EU and also an active player in several new European research and innovation policy initiatives, such as the ERC, JTIs, KICs, etc. However, there are reasons to ask whether national R&D support is crowding out European-level R&D funding in Finland (and surely in many other high R&D spender countries).

The strategy stresses the need for a strong and proactive role in influencing ERA policies and directions:

> Finland must be a prominent participant and influence in the development of ERI policy within the EU. It is only through active influence that we can make full use of the opportunities offered by the EU to enhance our own knowledge in selected fields and promote knowledge-based economy in Europe. The ongoing reform of EU innovation policy is a process in which Finland must be active. It is in our interest to influence European policy action and participate in the joint development of new instruments, such as those in relation to public procurement, demand- and user-orientation and the promotion of intellectual property rights practices.

Furthermore, the strategy states that the overall EU cooperation with third countries and parties must also be expanded in selected fields and that opening up national programmes and national financing is one means of promoting the development of the European Research Area.

According to the strategy, the national research policies for internationalisation are not optimal, and Finland "must strengthen the coordination of the internationalisation actions and improve EU knowledge and competencies at all participant levels". Interestingly, the vehicle for achieving this is to consolidate the operation of the EU sections responsible for research and education (i.e. the EU sections are responsible for discussing and preparing Finnish policy views and actions in the EU). Another important goal is to succeed in integrating national R&D programmes with the FPs. In more general terms, influencing EU research policy is considered to be a *new challenge* for Finnish stakeholders, requiring new capabilities and action.

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4 FinNode is a community of Finnish public and non-profit organisations designed to boost international R&D cooperation and business. It operates in China, Japan, Russia and the USA. The founders of FinNode are Tekes, the Academy of Finland, Finpro, Sitra, the Finnish National Fund for Research and Development and VTT.

Influence takes place at several levels and through a multitude of channels, such as during the special period of a country's EU Presidency, which according to the Finnish view offers an unprecedented opportunity to introduce issues to the European research policy agenda. Influence is also exercised through active membership in committees and expert groups, participation in events organised to formulate and assess policies, networking, lobbying, coordinated action and through personal interaction between events and special occasions. All these types of activities could be improved.

Cooperation in the neighbouring area

According to the strategy, ERI cooperation within the Nordic area and the Baltic Sea region must be stepped up *in a way that also promotes cooperation more widely within the EU area and at the global level*. Also, Nordic interaction must be further developed based on the countries' own priorities and common interests, according to the strategy, which highlights some successful examples of NordForsk instruments.

In general, the strategy finds that Finnish ERI cooperation must be strengthened among the Nordic countries and with the Baltic countries and Russia. Wider collaboration within the Baltic Sea region must be carried out through *multilateral action and through the EU*.

Concrete plans for the implementation of the Finnish internationalisation strategy are under development and a new official document is expected to be published during 2010.

ICELAND

Compared to the other Nordic countries, Iceland has suffered especially severe consequences of the economic crisis, caused by the complete collapse of its banking and financial sector in October 2008. The situation is still economically and politically unstable, and this also has an impact on science and technology policy, which is currently in a reorientation phase.

The strategic orientation of science and technology policy in Iceland is defined by the Science and Technology Policy Council (STPC), which has been at the core of the R&D policy system since its inception in 2003. It is comprised of 20 members and headed by the prime minister. The STPC is organised into two sub-committees, the science committee and the technology committee, which report to the Icelandic Ministry of Education, Science and Culture and the Ministry of Industry, Energy and Tourism, respectively. The Icelandic Centre for Research (RANNIS) is the main organisation at the operational level. RANNIS administers the main public competitive research funding and strategic research programmes in Iceland. This includes the two principal funding instruments for research and technical development, the Icelandic Research Fund and the Technology Development Fund. RANNIS also administers competitive research and innovation funding for students, strategic programmes and funding for infrastructure and equipment.

As part of the reorientation phase, the Ministry of Education, Science and Culture has charged various working groups with the task of assessing and making recommendations on the future direction of science and technology. In early 2009 a national task force was established to prepare a recommendation on the future of Iceland's education, research and innovation policy with assistance from a panel of international experts. The task force pointed out several systemic weaknesses that policymakers urgently need to tackle.[5] Policy discussions on international cooperation have largely been characterised by an outward-oriented approach, specifically in terms of researchers and companies seeking collaboration abroad. As a consequence, no explicit strategies for attracting international R&D performers to Iceland have been drawn up. Strategies for attracting international researchers to the country

5 Taxell et al. (2009). Education, Research and Innovation Policy: A New direction for Iceland. Report on behalf of the Icelandic Ministry of Education, Science and Culture, Reykjavik.

should therefore be integrated into future policies.[6] In addition to mobility issues, concerns were raised regarding the importance of prioritising research fields where Iceland has clear strengths and opportunities. The report mentioned promising areas that deserve more attention, such as health technology and science, as well as geothermal sciences and the creative sector. The task force also stressed the urgent need to assess and restructure the governance of S&T. To make the necessary changes, the STPC needs to be given greater autonomy so it can take effective decisions. At the same time, policy formulation needs to be strengthened at all levels, not least at the level of internal policy within RANNIS.

The importance of increased internationalisation for Icelandic research has frequently been emphasised in STPC policy resolutions. However, it has only recently been acknowledged at the strategic policy level that it is necessary to rethink and refocus on these issues. The latest science and innovation policy strategy for the 2010–2012 period was approved by the STPC in December 2009. It is clear that the recommendations put forward by national and international experts have been followed on some points. A central policy goal in the strategy is to strengthen international cooperation in research and innovation and at the same time make this cooperation more targeted. Assuming that the importance of international interaction for Icelandic research will increase in the future, the STPC recommends the following measures:

1. Assess the scope of, commitment to and opportunities for international research and innovation cooperation. Programmes that require financial contributions and membership fees from the participants should be given special consideration.
2. Strengthen the Icelandic Centre for Research (RANNIS) as the main funding and analysing body for research and innovation in Iceland.
3. Map the existing support services for Icelandic applicants to international cooperation programmes and establish cooperation on combining services to the various cooperation programmes that Iceland has access to.
4. The science committee and the technology committee will actively cooperate on shaping and implementing research and innovation policy in the Nordic countries and Europe as well as in international programmes, and use the experience gained for the benefit of policymaking in Iceland.

As a follow up to the STPC strategy, a *working group on Iceland's participation in international programmes* was appointed in early 2010 by the Minister of Education, Science and Culture. The group's tasks have been to assess the costs, obligations and opportunities related to international programmes in the field of education, research and innovation; to review the support services for Icelandic participants; and to put forward proposals on how these services could be reorganised in a more efficient way.

The main findings point to a number of fundamental challenges in the research system. The insufficient and sporadic support for applicants to international programmes, combined with weak overall policies in support of international cooperation, was found to be an important challenge. Support services for applicants to international cooperation programmes in the area of research, innovation and education were seen as inefficiently organised and not designed in the best interests of potential users. Also, the degree or extent of the support was considered to be inconsistent with the size or the extent of programmes. The findings also showed that in several cases it was difficult to obtain information about the number of Icelandic applications and funded projects involving Icelandic researchers, which made it difficult to assess the success of Iceland's participation in these programmes. It was also clear that

6 See Taxell et al. and the ERAWATCH country report 2009 on Iceland: Analysis of policy mixes to foster R&D investments and to contribute to the ERA.

there is not a straightforward way for applicants to obtain a comprehensive overview of the international programmes that Icelanders have access to.

The weaknesses of the official policy strategies and the lack of prioritisation of international cooperation (for education, research or innovation) were also mentioned as major causes for concern. The need for a more focused strategy based on prioritisation is viewed as crucial, considering the current development at the EU level which gives national funding a more important role than before. New European cooperation initiatives such as ERA-NETs and JPIs require countries to actively take decisions regarding their participation and whether to commit domestic resources to them. It was suggested that such decisions should be based on a careful assessment of interests and opportunities for the Icelandic R&D community. This would also require informed policies and prioritising based on a comprehensive overview of opportunities, demand and the success of Iceland in international cooperation.

The report also discusses the impact of an eventual Icelandic EU membership on the country's research and innovation system. In June 2009 the Icelandic government formally applied for EU membership. Following the endorsement of the European Commission on behalf of the European Council, Iceland would receive formal status as an EU candidate country. While an Icelandic EU membership would not have any direct consequences for applicants, it would have an impact on policymaking as Icelandic policymakers would have voting rights in programme committees in which EFTA countries are only observers. The biggest change envisaged is to achieve full access to Structural Funds, which are only available to Member States. For these reasons, Icelandic policymakers must formulate strategies on how to tackle the future changes and opportunities that potential EU membership would entail. In this regard, the working group recommended that policymakers look to the other Nordic countries and the Baltic states for advice on how to prioritise and put forward policy strategies related to Structural Funds and pre-accession instruments.[7]

In sum, it was recommended that:

- Support services for Icelandic participants in international programmes should be combined into a single service organisation that provides services related to Nordic, European, EU and other international programmes. In short, there should be a one-stop-shop for all applicants to international R&D and education programmes.

- The board of the new service organisation should be the body that decides which new programmes and initiatives Iceland will participate in based on the country's overall interests and resources.

The conclusions and recommendations were approved by the STPC on 19 March 2010. Since then a second working group has been set up (*Working Group on Implementation)* to put forward an implementation plan before the STPC meeting in June 2010 of this year.

NORWAY

Governance of the Norwegian research and innovation system involves many different ministerial bodies, advisory structures and a range of strategic actors, all concerned with the making and steering of policy and its implementation based on the general principle of sectoral R&D governance, i.e. each ministry is responsible for funding R&D activities that fall under its

7 Tækifæri til sóknar: Skýrsla starfshóps um þátttöku islands i alþjóðlegum samstarfsáætlunum (2010). Report from the Working Group on Iceland's participation in international programmes to the Science and Technology Policy Council, 19 March 2010. Reykjavik.

policy domain. Formally speaking, the Norwegian Storting (national assembly) is the highest political authority for STI (science, technology and innovation) policy in Norway. Several ministries play a key role in the development of national research policy. From a budgetary perspective[8] the main ministries for Norwegian research are the Ministry of Education and Research, the Ministry of Health and Care Services, and the Ministry of Trade and Industry. As mentioned, STI policy is an important activity for several other ministries as well, such as the Ministry of Defence, the Ministry of Fisheries and Coastal Affairs, the Ministry of Foreign Affairs, the Ministry of Petroleum and Energy, the Ministry of the Environment and the Ministry of Agriculture and Food. The Ministry of Education and Research is responsible for coordinating R&D policies across ministries and policy areas, which also includes national participation in international R&D organisations, the Framework Programmes and all new instruments under FP7 and the ERA actions. Accordingly, the Ministry of Education and Research administers the annual fees for Norwegian participation in the FPs.

The Research Council of Norway (RCN) is under the Ministry of Education and Research and bears the overall responsibility for promoting basic and applied research within all scientific and technological areas. The RCN is also responsible for enhancing the participation of Norwegian research organisations in the Framework Programmes.

Innovation Norway is the main agency for the development and administration of private sector-oriented policy instruments. Through its network of offices covering all Norwegian counties and more than 30 countries, the agency functions as a gateway to a set of policy instruments in the field of innovation and internationalisation for businesses based in Norway. More specifically, Innovation Norway assists promising Norwegian SMEs with the promotion of their products and services to international markets, with legal and other technical know-how on the export and import of services, IPR consultancy services, consultancy services on EU law and regulations, and with identifying business partners in other countries (including the USA, China, India and Japan), etc.

Within this general framework of STI policy orientation, the internationalisation of Norwegian research has been a top priority in national research policy for a long time (albeit less so in national innovation policy). This is manifested in official documents that outline public research policy such as the government white paper on research policy presented to the Norwegian Storting in 2005 which states that: "Internationalisation of research must be a fundamental perspective in research policy with implications for specific priorities" (Ministry of Education and Research, 2005). This emphasis was reiterated in the next white paper on research policy in 2009, which expands on this theme: "Internationalisation of research is important in order to increase quality and strengthen relevance of Norwegian research and in order to provide us with access to research done outside of Norway" (Ministry of Education and Research, 2009).

Similar reasons are given in other, and previous, official documents on Norway's research policy. In these, Norway's participation in the FPs is described and characterised for instance as follows: "EU research and EU Framework Programmes is the largest formalised arena for collaboration between Norwegian and foreign researchers" (Report no. 30 (2008-2009) to the Storting, *Climate for Research*). This same government white paper states the following policy objective: "Norwegian research policy must contribute to a high degree of internationalisation of research". Further on in the same document, the priorities set in the preceding white paper on research from 2005 were reconfirmed, i.e. that research policy related to internationalisation gives priority to four areas: 1) active participation in the European Research Area; 2) strengthening of bilateral research cooperation,;3) enhancement of Norway's attractiveness as a host nation for research; and 4) strengthening of Norway's position as a global partner in research.

8 Based on the distribution of government budget outlets or appropriations for R&D by ministry in 2010.

In elaborating these goals, the most recent white paper on research (2009) states that in order to strengthen internationalisation of Norwegian research, the following general measures should be implemented:

1. National research capability must be strengthened as a prerequisite for coping with global challenges and the international competition for resources for research.
2. National priorities in research policy must be supported by international research collaboration, and for this reason, clearer priorities for overall international collaboration must be set.
3. The rapid developments in the ERA and the EU Framework Programmes require clear priorities and goal-oriented measures in order to increase Norway's benefit from its contribution.
4. Research institutions and companies must improve their ability to participate in international research collaboration, and they must take responsibility for developing this type of cooperation.

The main strategy for achieving these goals is to strengthen Norway's participation in FP7 and to develop an active policy for participation in the ERA. This is also reflected in the RCN's new strategy for the internationalisation of Norwegian research (2010). However, Norway does not have a clear roadmap for how to prioritise and select from a large number of new, costly research activities under the ERA nor does it have any particular strategy for internationalising research within the thematic areas that are only marginally addressed or not addressed at all by the Framework Programmes.

The sheer volume of new European collaborative research activities within and outside the Framework Programmes, most notably the new joint R&D programme initiatives and the ESFRI infrastructure projects, is expected to become so great that Norway, as a small country with limited resources, cannot participate in all the policy initiatives launched by the European Commission, and must therefore prioritise how it will participate.

Parallel with Norway's participation in the Framework Programmes and the ERA, national research policymakers have gradually turned their attention to the CIBS countries (China, India, Brazil, South Africa, etc.), as is also the case with EU thinking on research policy.

In this increasingly more complex European and global research policy landscape, Nordic R&D collaboration unintentionally receives less attention than one would expect, given the potential synergies between Nordic, EU and global research.

SWEDEN

Over the past decades research policy has been given increasing priority on the political agenda. It is now considered a key national priority, especially since research policy is viewed as an essential component of innovation policy. European collaboration schemes and funding have played an increasing important role in Sweden in recent years. Sweden has increased its participation in the Framework Programmes for each new programme established, and Swedish researchers are engaged more often as coordinators of projects. Also, the Structural Funds have gained importance in the R&D activities at the regional level.

Sweden has no explicit national policy on the internationalisation of R&D. However, this should not be interpreted as a lack of interest in international issues or that internationalisation is given low priority in general. On the contrary, essentially all of the funding bodies and other authorities in the R&D sector, as well as the universities and other research-performing organisations, have ambitious, well-developed strategies for internationalisation. There are resources available at the national level to support international cooperation within the Framework Programmes and other EU programmes. In fact, international contacts and collaboration

in R&D are often seen as a quality indicator as such, but the task of internationalising is diffuse and it is up to the individual organisations within the system to develop their own strategies.

Consequently, the main drivers for international research cooperation are predominantly local – or locally defined and oriented. Individual researchers and research teams choose to become involved in international collaboration because they seek certain complementary scientific skills or competencies. As is well known, there is a certain social dimension too, as people often enjoy the contact and collaboration with others and gain satisfaction from participating in networks and cooperative efforts. Schools, faculties, colleges or universities may formulate and implement internationalisation strategies at an institutional level, not only at an individual level, but the motives are essentially the same: increased scientific quality resulting from access to information, techniques, skills and methods that they do not possess themselves. Hence, the drivers are mainly at the individual level.

The Swedish Ministry for Education and Research is responsible for designating national research policy. Other ministries are also engaged when their respective areas are concerned, such as agriculture, the environment or social policy issues. Responsibility for the internationalisation of R&D is also placed with the Ministry of Education and Research, which has a secretariat for international issues comprised of subunits; one of these handles the EU and Nordic region.

The organisation of the Swedish state is characterised by small ministries and large national agencies which in practice have the operative responsibility for implementing the national policies. All four research councils have funding schemes for international research cooperation. One of these, the Swedish Governmental Agency for Innovation Systems (VINNOVA), has the national responsibility for supporting Sweden's participation in the various EU cooperation programmes, including the Framework Programmes, and another council, the International Programme Office for Education and Training, has the national responsibility for international cooperation in education.

No particular organisation is responsible for Nordic R&D cooperation.

The main agency that provides funding for R&D activity is the Swedish Research Council (*Vetenskapsrådet*), with allocations provided by the Ministry of Education and Research. Its primary responsibility is to grant research funding in the natural sciences, social sciences, humanities, medical sciences and education. Funding is granted mainly at the individual level, but research groups and institutions have received a greater share of the funding in recent years. The Swedish Council for Working Life and Social Science (FAS), supported by the Ministry of Health and Social Affairs, is responsible for funding research on welfare, the labour market, health and social services. The Swedish Council for Environment, Agricultural Sciences and Spatial Planning (FORMAS) supports research on ecological, conservation, natural resources-related and construction issues with funding provided by the Ministry of Sustainable Development and the Ministry of Agriculture, Food and Consumer Affairs.

These research councils administer support schemes that promote international contacts within their respective areas, such as funding for post-doctoral research stays abroad and visiting international researchers to Swedish host institutions.

In addition to these councils there are six major national semi-public foundations: the two largest are the Swedish Foundation for Strategic Research (SSF), which supports research in science and engineering, and the Bank of Sweden Tercentenary Foundation (RJ), an independent foundation that aims to promote and support research in the humanities and social sciences. Three others are the Knowledge Foundation (KKS), which promotes basic and applied research carried out at newly established universities; the Foundation for Strategic Environmental Research (MISTRA), which funds research of strategic importance for a good living environment; and the Swedish Foundation for Health Care Sciences and Allergy Research (Vårdal Foundation), which stimulates innovative, interdisciplinary Swedish health care sci-

ence and allergy research. All of these agencies attach importance to international cooperation, although they may not necessarily make this a prerequisite for funding.

The Swedish Foundation for International Cooperation in Research and Higher Education (STINT), whose mandate is to internationalise Swedish higher education and research, is the sixth foundation, and it is a key player in the internationalisation of Swedish research. Through various funding programmes support is given to international cooperation as such. Team-to-team collaboration on a long-term basis, support to Ph.D. students and short-term visits abroad are examples of STINT's programmes. Activities are also oriented towards specific geographic regions.

No new institutional bodies or committees have been established to address internationalisation issues, nor does any open public consultation on internationalisation strategies take place. The respective organisations deal with this in their own manner.

The main instruments used to promote the internationalisation of research are the various funding schemes for individual mobility and a policy of favouring research projects that include an international component and cooperation when funding decisions are taken.

Sweden does not have a separate strategy for the internationalisation of research. Internationalisation policies are included in the respective organisations' general statutes.

In *general terms*, Swedish internationalisation strategies are mainly focused on cooperation with the EU and the US. There is some supportive institutional infrastructure in place for research collaboration with the EU (see above), such as the support office at VINNOVA and the National Contact Points in fields assigned to the other research councils. Individual researchers and administrators at universities can turn to the office at VINNOVA or the National Contact Points for advice, etc. There is no similar infrastructure in place regarding collaboration with the US; this is either the responsibility of the individual or may be managed by the local department or faculty. The situation is the same for collaboration with other parts of the world. An organisation such as STINT provides funding for collaboration in all areas of study and with all parts of the world, but on a competitive basis. Applications to STINT are evaluated on the basis of their scientific quality and anticipated internationalisation effects. Most of the funding and initiatives are targeted at individual mobility in one way or the other; that is normally how internationalisation is defined.

The universities have a range of bilateral agreements with other foreign universities and in some cases they are part of more formalised university alliances. Alliance-building seems to be a trend that is on the rise. The strength of the alliances varies greatly, and it is hard to judge how active and relevant they really are. Presumably, being part of an alliance is more of an advantage than a disadvantage, and the risk of negative consequences ought to be low. More and intensified alliance-building between universities is expected in the near future. In some cases alliances can lead to university mergers, but so far this is only within a single country. Sweden has seen a few mergers very recently (as have Denmark and Finland).

The indicators used are usually very simple: the number of international students, the number of visiting scientists/scholars, the number of outgoing post-docs, and descriptive presentations of collaborative agreements with universities abroad. Seldom are the outcomes elaborated on; the internationalisation and collaboration which occurs is seen as positive in itself.

3. SHAPING AGENDAS AND IMPLEMENTING NATIONAL PARTICIPATION IN THE FRAMEWORK PROGRAMMES

This chapter continues the discussion from the previous chapter on internationalisation strategies and presents a more detailed discussion of the following questions:

- What are the contributions of Nordic policymakers to EU decision-making on the development and adoption of the Framework Programmes, as well as on the development of the work programmes?
- How do the three levels of the Nordic research system interact in terms of efforts to follow up the EU research programmes at the national level and to provide the European Commission with relevant national and Nordic viewpoints (through programme committees, coordinating committees, advisory boards, expert groups etc.)?
- What is the willingness and ability of Nordic research policymakers to view national and Nordic priorities in a larger European context?

DENMARK

There is general agreement among Danish policymakers that it is possible to influence and shape the direction of the FPs. Despite Denmark's small size, the interviewees expressed a fairly positive attitude towards the possibility of making a difference and influencing the FP agenda. On general issues, there was a feeling that it is definitely possible for Member States to shape the final programme design, while it may be hard to gain acceptance for very specific viewpoints in the early phases of programme design. One of the informants said that Denmark has a certain degree of credibility in the eyes of others, which makes it easier to represent Denmark and be heard. The same person also pointed out that one must be vigilant and play an active role before, during and after delegate meetings and that carefully drafted position papers submitted to the Commission can be quite effective. Such a pro-active attitude is both demanding and time consuming, but it often pays off. Another interviewee stated that the Commission seeks out good ideas and opinions from all countries as well as from influential special interest organisations.

With regard to the role of Nordic coordination in shaping the FPs, a clear picture does not emerge from the interviews. On the one hand, there seems to be some ad hoc cooperation, although on an informal basis, between the thematic programme delegates from the Nordic countries which consists of sharing information and comparing viewpoints before meetings. This cooperation, however, is limited to general issues. Informants described how collaboration becomes significantly more challenging at more concrete levels. A representative from the Euro Center stated: "We could agree unanimously that the administrative and financial rules ought to be simplified. But in issues regarding the content of a programme, which field or topic to prioritise, we probably have different perspectives." Other policymakers claim that there is no coordination of Nordic positions at the FP programme level. Some even assert that coordination leads to more management, which there is no use for.

According to a ministry representative, however, coordination could be beneficial for all parties as a vehicle for reaching mutual understanding and as a platform for the exchange of ideas. Some policymakers believe that organisations such as NordForsk could facilitate this kind of policy coordination and collaboration, which would also mean that the Nordic position may be heard more clearly when European research policy is shaped.

FINLAND

Finnish policymakers reported positive experiences concerning their potential to influence research agendas at the EU level. Committee members have support groups at universities and

research centres. It is seen as easier to be heard in areas such as ICT, health, food and infrastructure. The funding agencies, Tekes and the Academy of Finland, and other stakeholders within industry are often consulted by the Commission. Tekes has established cooperation at the programme committee level and tries to find common interests. As one informant said: "There are cases where Finnish scientists lobby the committee delegates from all Member States, not only the Finnish programme delegates. Nordic coordination occurs but not in a systematic manner. For example, the Nordic countries share common interests in the food programme and forestry, but cooperation with other Nordic delegates is specific, and we also search for cooperation with other EU countries."

The Nordic countries could play a greater role here. One informant argued that NordForsk could serve as an arena where joint approaches are discussed and tested. This is especially true in the area of research infrastructure. Shortly after joining the EU, Finland considered Nordic cooperation to be superfluous, but in recent years it has reconsidered the value of such cooperation. Because of the small size of the Nordic countries, closer cooperation within the EU is once again seen as strategically important. It was recognised that the Nordic Heads of Research Councils (NORDHORCs) could act as catalysts for a broader and deeper integration of research activities in the Nordic region. As NORDHORCs is considered to be an influential forum for the shaping of Nordic research policies, some suggested that the director of NordForsk could participate as an observer in the NORDHORCs meetings.

In general terms, informants seem to agree that there are many opportunities for broader and better Nordic cooperation in the context of the FP and ERA, and this is an issue that requires increased attention from the Nordic Council of Ministers and NordForsk. The process of designing FP8 is still in an early phase and more could be done at the Nordic level to contribute to this process.

ICELAND

The Icelandic policymakers we interviewed agreed that it is difficult but not impossible to influence the European Commission and shape the direction of the FPs. Experience shows that the ministerial voices have often been heard. Not surprisingly, Iceland, as a non-EU Member State, finds this harder than the other Nordic countries which are Member States. As one interviewee explained: "Member States have better access to policymaking through ministers and council research working groups." Other channels are being used instead, such as CREST and EFTA. In open consultations on strategies, EFTA comments were perceived to be taken into consideration. In order to have an impact on FP agendas, it is crucial to be active in the early stages of the work programmes. The challenges associated with influencing the content of the work programmes have increased in tandem with the enlargement of the EU.

Icelandic civil servants take part in informal meetings between Nordic science and education counsellors, where common priorities and similar needs are discussed. According to one informant:

> There have always been informal mechanisms between the Nordic countries in this respect. There are often informal meetings in Brussels to discuss the programmes with Nordic partners. This is more common than one may think. In my experience these meetings are good. They are not necessarily planned much in advance but often common directions and plans are discussed.

It is important to be active at many levels and to be selective in the areas to approach. It was mentioned with regret that Iceland has not been successful in influencing the energy-related aspects of the programmes. For example, geothermal research, a central field in Icelandic research, is not included. While these meetings are generally seen as positive, they appear

to be organised on an ad hoc basis, and to some extent the membership issue is considered problematic. Interestingly, one informant remarked that the Nordic EU Member States do not always safeguard the interests of the Nordic associated countries. In some instances it was observed that Nordic EU Member States have put forward less favourable initiatives with potentially negative consequences for the associated countries. According to the interviewee, these proposals can diminish the potential for countries like Norway and Iceland to influence the political processes of the ERA. In other words, common Nordic needs and priorities cannot be taken for granted in all circumstances. Nordic level coordination during the preparation stages of the work programmes would therefore be a much-welcomed support, especially from an Icelandic and Norwegian standpoint.

NORWAY

In general, Norwegian policymakers find it challenging but not impossible to have an impact on the EU's R&D framework agenda. "Addressing national viewpoints as a national representative is entirely possible. We are frequently listened to on such occasions," said a representative from a ministry with a substantial R&D portfolio. At the same time, the representative added that "there is a need for better coordination of viewpoints between the different Nordic countries in external meetings and in workshops". In addition, this informant welcomed more policy coordination by both the Norwegian Ministry of Education and Research and by NordForsk at the Nordic level in order to move their sectoral needs higher up on the research policy agenda. The informant emphasised the potential to achieve greater impact inter alia by utilising the Nordic dimension fully as a stepping stone for improved participation in the FPs.

Another ministry representative stated that delegates can succeed in addressing national viewpoints, but this is true mostly in the early stages of programme design and implementation and within the standing programme committees under DG Research. The same ministry informant mentioned that the committees of the Nordic Council of Ministers do have a coordination effect on national research priorities in the Nordic region and that NordForsk has a role to play in strengthening this type of coordination process in the future.

Informants from the Ministry of Education and Research stated that the effort to coordinate research infrastructure priorities at the Nordic level is an effective albeit rather new means of advancing Nordic priorities in the ERA, which attests to the potential of increasing the Nordic region's impact through coordination. At the same time, this multilateral coordination effort is considered to be demanding and difficult to implement within the time frames available.

Policy challenges and policies for Nordic cooperation

The ERA has been developing rapidly, challenging national governments to keep up the pace. Both the development of FP7 and the preparations for FP8 are placing great demands on Norwegian research policy coordination. "New and reinforced instruments in FP7 are challenging the Norwegian research system by redefining the interaction between national and European activities in a completely new way, in line with the ERA concept; including instruments like integrated projects, Networks of Excellence, ERA-NET, and initiatives following Articles 169 and 171 of the EU Treaty, along with European technology platforms in addition to FP7".[9] This, along with related developments, necessitates extensive policy coordination efforts on the part of national governments. The Ministry of Education and Research is responsible for these activities in Norway, in dialogue with other ministries and their respective FP7 programme committee delegates and with the RCN.

Several of our informants at the ministerial level emphasised the complexity and scale of this task at the national level. The ministerial informants stated that coordinating policies

9 Strategy and Action Plan for EU Cooperation (2008:17). Ministry of Research and Education.

and national priorities across the Nordic countries is even more demanding due to the time frames which are hard to keep up with even at the national level. Despite national views to the contrary, the unified nature of the Norwegian research council structure may be an advantage in the efforts to coordinate Nordic research policy priorities since the RCN is the sole representative of Norwegian viewpoints in the NORDHORCs meetings. NORDHORCs may play an important role in coordination, e.g. development of joint programming in the Nordic Research and Innovation Area and on strategic issues related to the EUROHORCs' agenda.

In response to the *global challenges* related to climate, energy and the environment, the Nordic countries initiated a common research initiative (the Top-level Research Initiative) under the Nordic Council of Ministers in 2009. This initiative is a joint effort in which two-thirds of the funding is provided by the national research councils, and one-third is allocated by the Nordic Council of Ministers. The initiative was launched in 2009 and the first research contracts were awarded in the spring of 2010. However, several of the Norwegian informants in the sectoral ministries were not familiar with the new initiative (in contrast to the research council informants). The Top-level Research Initiative may prove to hold even greater potential should the Framework Programmes address these global challenges to a greater extent in the future. In this case Nordic researchers as well as research policymakers will have built a crucial foundation for pursuing a Nordic agenda in the European context, as foreseen by the informants.

By the same token, geography may also divide the region; for example, ocean research as a Grand Challenge is a high priority area for Norway, but there is limited interest in this initiative from countries on the Baltic Sea, according to our informants.

Nordic countries may also expand research cooperation with selected countries in Asia, such as China and India. A NORIA-net has been working in this area. It may be important to pool resources and build up a critical mass for research collaboration with rapidly growing research nations that hold great potential for the future.

SWEDEN

Swedish policymakers also agreed that it is possible to have influence at the EU level. However, Sweden, also a small country, finds it difficult to advance its national interests in negotiations at the European level. The informants cited two factors that must be in place in order to successfully influence the EU agenda:: a pro-active strategy and collaboration with other countries to increase their political clout.

The development of the FPs goes through different phases, from pre-draft negotiations to the implementation of the draft. The negotiations continue throughout the entire process but, according to one interviewee, it gets gradually harder to make any significant changes. A pro-active strategy could be a key to successfully influencing the various processes. An active approach in the early stages of negotiations could make it easier to gain attention for national interests . Some of the policymakers mentioned this as an important strategy.

Many of the Swedish policymakers stressed the importance of collaboration with other countries in order to gain influence over the development of the FPs. Some of the interviewees see the other Nordic countries as Sweden's natural allies, given the close cultural and political ties they share. "The way Sweden has tried to do it is through a conscious and consistent use of alliances," said a representative from the ministry with significant experience. Others said that it is quite possible to make yourself heard as an individual. All it takes is engagement and patience; you might have to work actively for a number of years in many different channels, but if you have good arguments you will be heard.

The coordination of Nordic positions on the development of the FPs occurs ad hoc, and from a Swedish point of view lacks formal structure and organisation. Much of the coordination is dependent on individuals within the ministries or the agencies that deal with these questions.

An experienced representative and former programme director at a research council stated:

"When it exists, it is not decided from above but rather from the individuals themselves. It depends on those who think Nordic aspects are important. It has never been prescribed from above that there should be Nordic pre-cooperation." Another interviewee with experience from Swedish agencies felt that Nordic cooperation definitely exists, but that it needs to be enhanced. The Swedish agencies lack enthusiasm for Nordic cooperation compared to the other countries. Some policymakers felt that there is room for organisations such as NordForsk and NICe to provide more support for Nordic coordination of national positions on FP matters.

CONCLUSIONS

Interviewees from all Nordic countries believed that shaping research agendas within the FPs is possible, but it requires systematic and intense networking activities, clear views and well-substantiated arguments. It is also evident that large R&D organisations and companies have their own direct and indirect channels of influence, within and beyond programme committees and national delegates.

The communication dynamics involved in implementing working programmes in the thematic priorities of the FP7 are so complex that only ad hoc and flexible forms of mutual consultation are possible to achieve at the Nordic level.

This means that a more systematic coordination of Nordic positions is only feasible at a more strategic level and with a longer time horizon. Designing new Framework Programmes and establishing the future direction of ERA policies and instruments are good examples of policy areas that allow for a more systematic coordination of Nordic positions. A precondition for this is the creation of suitable Nordic arenas where national policy decision-makers can meet, reflect on and ultimately agree upon common Nordic policy actions. NORDHORCs is probably an example of one such discussion arena. NORIA-nets is another example. NordForsk could improve the coordination of Nordic FP and ERA policies by preparing position papers based on high-quality policy analysis and by signalling areas where it is sensible to coordinate Nordic positions and actions.

4. EXPERIENCE OF NORDIC RESEARCHERS WITH EU RESEARCH

In this chapter we summarise the interviews with Nordic participants in FP6 and FP7, with special focus on three issues:

- What are the drivers and motives for participation in the Framework Programmes?
- What lessons can we learn from their participation at a national and Nordic level?
- What is their experience with the new policy initiatives in FP7, such as the JTIs, Article 185, etc.

DENMARK

Drivers, motives and lessons learned

As *drivers and motives* for participation in the FPs, two interrelated themes were mentioned by all the interviewees: networking and the exchange of experiences with the partners It was further pointed out that FP funding has symbolic value, and gives a higher degree of credibility to the projects and signals their importance. "FP participation is appreciated, it is an important signal to everyone that what you do is of high quality." One researcher mentioned that FP participation often formalises the collaboration that already exists.

There is a general agreement among FP participants and policymakers alike that the fit between FP funding and national funding is good. The thematic priorities are the same, at least on a higher policy level, but the amount of national funding is often much less. The FP calls are both wider and more precise in their design. National programmes generally do not have very detailed requirements; they are more bottom-up and leave it up to the researchers to formulate relevant research questions. In the FPs, it is the other way around. One researcher pointed out that there is a new generation of calls for research grants which is inspired by the FPs. Several of the interviewees also pointed out that even though the fit is rather good in general, this also depends on the research theme.

International orientation of the research activities

Danish researchers have wide networks all over Europe and often globally as well. Naturally, researchers from their own and other Nordic countries are part of those networks, but none of the interviewees said that the Nordic perspective is central or even particularly important. If anything, the Danes we interviewed seemed more likely to collaborate with Dutch or British partners than with Nordic partners. Several, but not all, Danish participants in the FPs and new instruments, as well as policymakers, favoured Nordic collaboration in more abstract terms – but they had few concrete ideas of how or where such Nordic collaboration could flourish.

So there appears to be little real interest in collaboration with Nordic partners as such. When speaking to Danish participants in new instruments and the FPs, it also became clear that the Nordic perspective was not at all central for them. Clearly, collaboration with researchers from other Nordic countries takes place, not because of a 'Nordic agenda' but rather because they are good researchers– who in some cases happen to come from other Nordic countries. One researcher explained his collaboration with Norwegian researchers over the years by stating: "Solely individual related reasons". This is also corroborated by two centrally placed policymakers, who stated: "Not an important aspect in our daily work".

Relevance of the FPs and the new instruments

All interviewees agreed that FP7 funding is well suited to their core activities. This funding is welcomed since it is the best way to raise one's research to a higher international level. It is also an excellent way to create and expand already existing networks. One researcher pointed out that his research activity and all the staff he has employed are funded under FP projects

and that none of this would be possible without this funding. According to one researcher, though, the projects are not fully financed, and complementary funding must be obtained from other sources.

Experience with new instruments

As for the new instruments, these are described as an even greater opportunity than the 'regular' FP funding. The Danish participants in the new instruments we talked to do not regard these as part of the FPs, but as something distinct from them. As one interviewee stated; "FP7 is more focused on research, and there is a bigger role there for university partners. ARTEMIS funding is closer to the market and product development".

The Danish respondents praised the new instruments as a form for administering joint projects. These projects are more spot-on towards the market, and in one case they have given a social scientist a sought-after opportunity to engage in closer, more focused network collaboration. The two funding instruments seem to complement each other well.

However, coordinating a project such as ARTEMIS is difficult, and much more so than running regular FP7 projects. As one Danish coordinator told us: "If you ask the Danish Ministry, they'll say it´' simple, and perfect – but it's not!" So while these new instruments are probably easier for the participants, they are not so easy for the coordinators.

Thus, participation in FP projects and the new instruments yields different benefits. More money for EU research means more focus on it. This in itself is important, as EU research is then placed higher up on the political agenda. Another strength mentioned previously is the establishment of research platforms for important areas such as the environment and transport. Resources could be focused in these areas.

One policymaker pointed out that the most recent developments in FP7 regarding the attempts to establish a dialogue with national interests are very promising: "Common coordination, joint initiatives, joint ventures, that is good". The establishment of the ERC is seen as a positive development by all, and a true strength. The ERC applies constant pressure to ensure quality within the system. One interviewee described it as an "amazing, fantastic creation". This is meant both from a national point-of-view and from a European point-of-view and context.

At the same time, it is clear that the range of EU instruments is becoming more and more complex. There is increasing diversity and complexity within each instrument as well. There are too many sub-initiatives, which makes it difficult to gain an overview. In the thematic programmes, there is a strong need to simplify the procedures. One interviewee pointed out that Nordic organisations could play a role in this regard. "The problematic thing with the FPs is that there is such a huge range of possible instruments to apply under," he said. There are many instruments, and quite a few support offices to turn to. It would be helpful, he said, if there were "a support structure for Nordic research groups to find out where to apply and how to do it, and arrange the right constellation".

It is also not necessarily clear why the focus should be on the European Union only. One policymaker echoed a question that several Swedish policymakers have asked: "Why should the research funded only be of the highest European standard? It should be of highest international standard. In order to increase competitiveness and collaboration, FPs ought to be opened up to countries outside of the EU too."

FINLAND

Drivers, motives and lessons learned

Apart from access to research funding, the motive for participating in EU research is to strengthen networks with international partners and, for obvious reasons, to strengthen research. For large research centres, such as VTT, and for many SMEs a motive to participate

in the FPs is to increase their visibility among international companies. Increasing visibility is a way to attract more cooperation in future projects. The motive for participating in Nordic research is slightly different. The actors know of each other and thus the need for increased visibility and networking becomes less important. Nordic funding is therefore seen as important mainly for developing expertise. Large countries such as the United Kingdom, Germany and France are important, but a lot of cooperation takes place with Sweden. Cooperation with countries outside of Europe is also growing, and recent cooperation has been initiated with China through a Euratom project, also together with Swedish partners.

As the importance of international cooperation outside the European Union increases, Finnish actors are becoming more selective. While Finland used to view international cooperation as an important dimension *per se*, it now focuses on selecting the most important and relevant projects under FP7.

Experience with new instruments

Finnish actors are proactively following the evolving FP instruments. VTT is already a partner in ARTEMIS (an Article 169 initiative), and the European Institute of Technology is locating one of its information and communication technologies research units in Finland. The Finnish unit is located on the Aalto University campus in Otaniemi with the founding members of the unit being Nokia, VTT Technical Research Centre of Finland and Aalto University. ARTEMIS is seen as a good example of Finnish views being taken into account in the development of EU instruments. One of the informants noted that at a general level, the new instruments (JTI and Article 169) are welcomed due to extensive involvement by private companies.

The actors at the national level are regarded as active and effective in influencing the content of the Framework Programmes. The question was raised as to whether a coordinated Nordic effort in this regard was actually beneficial, as the Nordic level would "come in between" the national and EU levels. At the same time, it was recognised that a coordinated Nordic effort might be useful in some research fields "depending on the latitude", such as forestry, agriculture and the environment..

In other interviews, participants in the new initiatives under FP7 appeared to be less enthusiastic. One of the informants questioned the benefit of the new instruments for small universities.

Participants in BONUS – an Article 185 (ex Art. 169) initiative - expressed positive views about the organisational aspects of the initiative, and noted that one advantage of the Article 185 initiative will be the availability of resources for advocacy in the initial stages of the programme. It was pointed out that these resources will enable participants to integrate research into decision-making processes and use them as a tool for integrating different research areas. The strategy phase, planned for the 2010-2011 period, will be dedicated to preparing and informing national stakeholders, such as ministries and funding agencies, about the initiative. It was noted that research will benefit from new perspectives, which would have been difficult to obtain in a traditional FP project. In the case of Baltic Sea research, the initiative has introduced new interdisciplinary themes, combining science, policy and socio-economic aspects. The research councils normally focus on basic research, but the intention of the programme board is to incorporate the innovation and technology aspect. This requires the involvement of innovation agencies, which have traditionally not been engaged in Baltic Sea research. The total funding for the BONUS 169 programme until 2016 is €100 million, of which €50 million comes from the EC and the remainder from the Member States. The Member States have yet to commit the funding. Nordic funding institutions are not part of the programme, but an eventual future involvement of NordForsk and/or NICe was viewed as positive.

The main objective of the BONUS EEIG is the implementation of the Joint Baltic Sea Research Programme, BONUS-169, under Article 185 (ex Art. 169) of the EC Treaty. The programme will

be funded jointly by the EU and all members and associated members of the EEIG, as well as by other donors, during the 2010-2016 period. The anticipated funding volume is approximately €100 million. The legislative proposal concerning BONUS-169 was handled by the European Parliament and Council in 2010, and the final decision was taken on 16 June 2010. The Nordic participants are Sweden, Denmark and Finland.

Convincing the Member States to commit funding for Joint Technology Initiatives appears to be more problematic. A Finnish informant, involved in the ARTEMIS Embedded Computing Systems Initiative, expressed concern about the lack of commitment of many Member States to fund their national participants. The fact that part of the funding is dependent on national-level decisions causes confusion. When countries decide not to fund their national participants, it means that preferred participants have to be replaced by participants from other countries. This situation does not lead to optimal research. The informant stated that in this respect the traditional FPs, in which only the European Commission is involved in the funding decisions, are much easier to deal with. In Finland there has not been a problem with funding. National funding from Tekes enables Finnish participants to fully participate in ARTEMIS. However, it is a problem when countries do not allocate the funding as promised in the original plan. The informant feared that in the end ARTEMIS will only be allocated half of the planned funding.

ICELAND

Drivers, motives and lessons learned

Icelandic researchers consider Nordic and EU funding to be crucial, as funding from Iceland is quite limited. Thus, the drivers of participation are access to a larger pool of resources and the need to find collaborators who can complement their research activity. In general terms, the interviewees said they had good experience with participation in the FPs. Icelandic researchers cooperate frequently with other Nordic partners in EU research projects. From our interviews, however, we found that cooperation with Nordic partners was more frequent in the past and that cooperation is now occurring more often with other EU countries. Researchers reported mixed experiences with their participation in Nordic research cooperation. One informant told of a negative experience with his participation in the ERA-NET consortium SAFEFOODERA, which is partly coordinated by the Nordic Innovation Centre (NICe). The criticism was particularly directed towards the ERA-NET funding model, which was based on the distributed pot concept. This type of funding model made it difficult for participants to receive the necessary funding from the national funding bodies. Neither the Icelandic nor the Finnish partners were granted funding by their national funding bodies, and this had negative consequences for the entire activity. According to our interviews, the lesson to be learned from this experience is the need to establish a common pot solution in which national funding bodies commit resources in advance. Our interviews do not indicate that participants have actually been able to influence the FP instruments or annual work programmes, but they were all aware of the processes and had been involved in submitting ideas to the Icelandic Centre for Research (RANNIS), which coordinates and forwards input to the programme managers. Informants generally agreed that given good preparation, it is possible to exert some influence on the work programmes. In this respect it was stressed that stronger Nordic coordination could be valuable.

NORWAY

Drivers, motives and lessons learned

Access to research networks, expertise, scientific excellence and funding are the most important motivations for Norwegian participation in the Framework Programmes. Norwegian interviewees and experienced participants stated that access to research networks was of great or very great significance in their motivation to participate in EU research, which almost all of

them characterised as being of high scientific merit. Several mentioned that their participation in FP6 and FP7 was the direct consequence of previous projects funded under FP5 and even FP4. An example of such research activity is the METOXIA project (FP7), a Danish-Norwegian project originally supported by Nordic research funds which was expanded to a larger EU project consortium under FP5 (OXNORM), received renewed funding under FP6 (EUROXI) and now has become one of the largest projects under the health research priority area of FP7. Due to the thematic continuity of the FPs, European networks and research activities may be funded for long periods of time, provided they are scientifically and commercially promising and they display clear advancements in their research agendas. Such long-term research endeavours provide researchers with a deeper understanding of the organisation and workings of the FPs, and it is common for senior researchers with experience and a good track record from FP3, FP4 and FP5 to exercise considerable influence not only on their national R&D organisations but also on the FP work programmes.

It is also worth noting that several researchers said one motivation was that the project was an integral part of their organisation's internationalisation strategy, indicating that organisational policy and attitudes towards international projects and collaboration are important and encourage participation. One researcher mentioned in particular that the legal support on IPR issues provided by his organisation was vital. In other words, EU projects – and probably international projects in general - on research topics corresponding to the organisation's own research priorities represent an important driver and probably a precondition for success. The establishment of networks for future collaboration is another important driver.

The key lesson learned from this is that national and Nordic research policymaking should focus more on how to improve organisational strategies and administrative support capacities that will facilitate not only increased participation in international projects and activities but also greater 'impact' and synergies between these activities and the overall research undertaking of the R&D organisations.

It was also interesting to hear what experienced researchers had to say about their FP versus Nordic participation. As one interviewee within energy research put it:

> Our participation in the FP directly supports our strategy of becoming the leading research organisation within this particular area. We collaborate with Danish colleagues but you do not find many strong teams within this area in Nordic countries. We are therefore, collaborating mostly with researchers from the Netherlands, France and the UK and occasionally with researchers from Germany, Spain and Italy. In fact, I participate in the Top-level Research Initiative , but I have difficulty seeing the added value since the difference between the FP and the Nordic programme is not obvious and European researchers think so much alike that there is no immediate need to work closely with Nordic partners. At this moment our priority is the FP and Brussels.

Experience with new instruments

As with the Finnish researchers, Norwegian researchers also seem to have a taste for the new FP7 initiatives. Recent figures show that Norway has rather extensive participation in the new FP instruments, in particular in EUROSTARS and the JTI initiatives ARTEMIS and ENIAC. One of the advantages mentioned regarding the JTIs is that they are so large that they are able to build critical mass and therefore manage to address both conceptual and methodological/technical issues in an integrated manner. On the other hand, Norwegian experience indicates that the organisation of the JTIs is complex and difficult to manage, for much the same reasons as those stated by other Nordic participants (see e.g. the section on Finland). EUROSTARS, on the other hand, appears to be a more flexible instrument, suitable for the needs of innovation-intensive SMEs.

Norwegian participation in the ERC schemes has been relatively low so far. However, the impact of this participation is considered to be great, both scientifically and in terms of the reputation and attractiveness of the beneficiary research centres. Funding of bottom-up basic research is very limited in Norway, so from this perspective ERC funding is clearly a complementary source of funding in the Norwegian research system.

In general, it is fair to conclude that it is too early to draw firm conclusions about the anticipated impact of the new instruments on the Norwegian research system. The participants we contacted had no clear picture as to how Nordic research policy could contribute to facilitating Nordic collaboration in new instruments, with the possible exception of Nordic co-participation in the JTIs.

SWEDEN

Drivers, motives and lessons learned

The Swedish participants in FP7 projects that we interviewed generally expressed enthusiasm and satisfaction with the projects they have been involved in. Some of them have participated in several projects, and often in previous FPs. Funding under the FPs has opened up a range of new possibilities, new research activities and the expansion of research groups. New post-docs and funding for Ph.D. students or other staff members were mentioned repeatedly as the main benefits. FP funding has also brought attention to the research group or the institute due to its prestigious character. As one informant stated:

It gives support for hiring people: four Ph.D. students, two post-docs, and two more coming in the fall. In addition to hiring possibilities, it has boosted the reputation of our institute. It is a prestigious grant.

On the negative side, some people may run into problems with coordinators or they find out they might be in the wrong kind of consortium. The opportunity to withdraw at that stage could be limited, and the requirement to pay back the funding could be enforced. One person stated that sometimes in the FPs there are "too many contracts, too little funding".

When we asked about their motivation for participating in a FP project, funding was mentioned as a primary motive. Another rather pragmatic reason to participate was also mentioned: they wanted to keep conducting their research and this was one way of funding it. They felt that the funding had given them the freedom to do so. The FP funding had also given them the opportunity to establish international collaboration and build networks.

We asked the participants whether they had adjusted their research strategies to fit better with the priorities of the FP instrument they had applied to. Only one participant admitted that he probably had done so: "Well, yes, a bit, in order to optimise the chance of getting funding. I think we all do that. It is mostly a matter of emphasising some aspects in the application. Like interdisciplinary aspects. That is an adjustment. This is totally normal and always done vis-à-vis the Swedish Research Council or anyone. Others denied that they had made any adjustments at all.

Experience with new instruments

The interviewees had somewhat different opinions regarding how the various FP instruments have developed over time. One person noted that the earlier instruments were driven more by societal/political interests and not so much by the quality of the research undertaken, which often leads to more social interaction and networking than research. This person was quite happy with the new BONUS instrument, which allows time for more research and entails less administration.

In contrast, another participant described the new instruments as "extremely difficult and complex" and stated that the university's department for research services had been expanded from four to 12 people (in order to meet the needs related to FP7, we assume). The establish-

ment of the ERC is also praised.

The FP participants were asked whether they knew of any way to influence the design of the FP instruments or the annual work programmes. Did they feel that national authorities could take or had taken steps to coordinate national priorities with regard to European policies or funding instruments?

There is no indication from our interviews that participants have actually been able to influence the FP instruments or annual work programmes. However, many of them have good contact with project officers, usually DG research staff or the responsible National Contact Point. Participants do not have strong opinions about whether national authorities can take steps to coordinate national priorities and interests in a better way.

Many interviewees believe that Nordic organisations have a role to play in coordinating national participation strategies and practices in the FPs. It is unclear, however, exactly what this role should be. Some ideas mentioned in this regard include establishing Nordic networks designed to influence the FPs, advocating for certain fields or themes of relevance to the Nordic region, and coordinating Nordic interests. According to one informant, such initiatives could build on existing Nordic scientific networks. Support for mobility, courses and workshops – 'glue money' – was yet another suggestion. It should be noted that additional research funding through programmes on a Nordic basis was not mentioned.

The respondents have not received much help from national support offices or the like. This function, which is often placed with research councils, could probably be restructured.

One interviewee said:

> No. It would have been possible perhaps, but also difficult. They ask for papers before they are ready, for instance. It would be a good thing if the people who want to help could operate on a short time frame. Personal help could then be advantageous. Now it is just another application in addition to the main one.

And another stated:

> Very little support from the national agencies – we are the ones who have to give them support! It also depends a lot on who the actual person is that acts as the National Contact Point (NCP).

It is clear that the researchers have relatively strong international networks in many countries, and they do not have a strong Nordic perspective. They conduct their research with relevant partners whom they know, regardless of where they are located. The purpose is always to obtain funding for their research. Their networks tend to be more European than global. They seek out partners who share certain interests and values and with whom they can talk and work together easily. They often feel that it is easy to talk to Nordic colleagues due to the similarities in culture and language, but they may find it just as easy to talk to colleagues from other nations.

Towards the end of the interviews, we asked the participants to recommend any Nordic instruments that they believe would benefit their own organisations and to suggest measures for strengthening Nordic participation in the FPs. The respondents primarily mentioned funding for relatively low-cost activities: networking, seminars/conferences, researcher schools, researcher mobility, and possibly research infrastructure. It should also be possible to apply for smaller sums of money, about €10 000 for example, in order to support young researchers and provide the 'glue money' mentioned above.

> One of the Swedish FP participants and project coordinators directed a concluding statement to NordForsk and, we believe, to other funding organisations: Time is what is generally missing. This is important for the funding organisations to understand. We don't have time. It must be easy to apply.

The researchers' drivers and motives for participation in the FPs are first to continue to conduct their research and secondly to participate in networks. As far as we can tell, the FP instruments as such, or the priorities within them, hold less attraction for the researchers. The researchers may note some positive features in a given instrument, but they also mentioned some negative and complicating ones. Administrative routines appear to be particularly frustrating, and the only time these were regarded as relatively easy or fair was in relation to the BONUS programme, in which reports are submitted to the national councils, according to national standards, not according to EC standards. These comments merely underscore the perceived problems with administration in the FPs. On a positive note, one participant remarked that the new FP instruments put more focus on the research activity and its quality than the previous FPs. The establishment of the ERC is one example of this, but the other instruments show the same orientation, and from this perspective the range of FP7 instruments is probably more attractive to the researchers themselves than was the case in FP5 or FP6, for instance.

The international orientation of the projects is strong, and often heavily European. This should not be any surprise. They are not especially Nordic, and we see very few common Nordic perspectives in the projects. The informants are not applying a specifically Nordic mindset at all – they see themselves as Swedish or Danish project leaders acting in an international scientific arena, perhaps with an emphasis on Europe.

The interviews revealed very little impact from FP participation other than providing the opportunity to continue to conduct the research that they wish to pursue and to collaborate internationally. The sheer amount of funding has also provided good opportunities to grow and expand their research groups by hiring more staff and running large projects.

The researchers emphasised more than once that, when applying to an FP instrument, they found that taking a Nordic perspective or lining up a number of Nordic partners was usually not a successful approach. In the FPs, the perspective ought to be European, not Nordic, and the partners should instead come from a wider group of European countries. Acting too Nordic in the FPs is simply not a good idea. Nordic organisations should keep this in mind when planning the types of support activities they wish to develop.

NORDIC RESEARCHERS EXPERIENCE WITH PARTICIPATION IN FP7

The Nordic region shows strong participation in the new instruments under FP7, from fundamental research (ERC) to the five JTIs and all Article 185 (ex Art. 169) activities, including EUROSTARS. Concurrently, Nordic participation is also strong in the more traditional collaborative research activities of FP7. This demonstrates that research in the Nordic region is highly competitive and adaptable to new instruments and policy challenges.

Nordic research policy governance has a good reputation among the interviewees, but it could be more visible to researchers in applied sciences and engineering. Also, the level of Nordic (regional) R&D funding was almost invariably characterised –by influential policymakers and participants alike – as too small to make a real impact. The number and scope of the new measures introduced under FP7 were felt to be so great that even large organisations do not have the information and strategic resources to understand and properly assess them, a sign that ERA policies are being implemented quickly, probably too quickly for many small and large R&D organisations and for many research policy administrations, especially in small countries.

One of the Nordic strengths is undoubtedly the strong networks of Nordic researchers, but

it is also evident that the Nordic region has not yet exploited its full potential within the FPs, and as the ERA develops rapidly – much more rapidly than the NORIA-nets – there is a danger that Nordic R&D governance will lose momentum.

It is therefore of fundamental importance to restate what the vast majority of interviewees told us, namely, that Nordic collaboration is important to them, primarily because of its strength and secondarily because of the cultural and linguistic similarities as well as the geographical proximity of the Nordic countries.

COMPARING THE VIEWS OF NORDIC PARTICIPANTS WITH THE VIEWS OF NORDIC POLICY-MAKERS

The views of Nordic policymakers and experienced researchers typically *converged* when they looked at the Nordic research area, its function and potential. In the midst of a rapidly evolving ERA they felt little need for yet another organisational stratum in addition to the national and the European ones. While they most often expressed a positive attitude towards collaboration with Nordic colleagues, they also indicated that they prefer to collaborate with those who are best suited for any given situation, in any given project. Although this is normally perceived to be easier with Nordic colleagues, and Nordic collaboration shapes and strengthens their research, research collaboration only within the Nordic region is rarely the best situation for Nordic research. The FPs provide a larger (but also a more complex and more bureaucratic) collaboration arena. This means that Nordic research funding schemes are at their best when they prepare Nordic researchers to achieve excellence and to meet stiff competition in the FPs and in other forms of international research collaboration and when they do so promptly, efficiently, effectively and with minimum red tape. There was a convergence of views between national policymakers and researchers in the Nordic region on these points.

Participants and policymakers also expressed similar views on the kinds of support that Nordic research organisations should provide: funding for lubricating networking among Nordic colleagues, seed-money for more ambitious research project ideas, research infrastructure, workshops, and perhaps better organisation and coordination of Ph.D. training across the Nordic countries. Many elaborated on the idea that Nordic organisations should take some kind of coordinating role vis-à-vis the EU and the design and preparation of the FPs. This is a task that is very complex for individual researchers or research institutions, and one that requires policy skills as well. It is an interface where the policymakers' and the researchers' interests and skills truly meet, and the key to success likes in finding functional ways of working and communicating. Nordic research policy organisations may play a role in this, rather marginally, but their primary role is in shaping and implementing the NORIA concept, which incidentally is not understood even among the most experienced Nordic researchers.

The views of policymakers and researchers often *diverged* when they talked about the purpose of participating in FP instruments. The policymakers were inspired by – and even committed to – the spirit of the European Union and its ambition to create a coherent, globally competitive European research area, while the researchers had more pragmatic reasons for participating. Their primary motives were to obtain research funding to continue with their research in their networks – much as before. This does not mean, however, that they are not ambitious for their own sakes and the sake of their research teams. When asked about the benefits of participating in the FPs beyond getting funded, they invariably mentioned networking opportunities. However, it is clear that in many cases they are merely keeping up with their established (and obviously efficient) networks, and in this regard it is important to reflect on the fact that there are not many collaboration arenas in the world that support research activities conducted by international networks. One of these is, of course, the Nordic arena.

Their views also appeared to diverge on the issue of simplification. In principle, both groups thought that the FP bureaucracy is heavy, but while many Nordic researchers (who are accus-

tomed to well-developed., efficient research funding schemes) described this as a real problem, the policymakers used much milder terminology and tended to downplay the severity of this issue, probably because they think that this is a universal condition for all researchers in the FP. Some project coordinators described situations or circumstances that caused exhaustion and near panic, for instance when an international partner left the project for some reason and funds needed to be repaid. Dealing with legislation and university administrations in other countries, and the administration and bureaucracy of the European Commission, had occupied months of their time. Policymakers seemed to be less concerned about, or aware of, such problems. Some respondents elaborated on the idea that the coordinating role could be more professionalised and at least in part be taken over by professional administrators in their organisations, in cooperation with research project leaders.

5. NORDIC COLLABORATION SCHEMES AS POLICY TOOLS FOR ERA

In this chapter we summarise the views of Nordic policymakers on how Nordic collaboration schemes could be developed as policy tools for the ERA. This chapter is largely based on responses from policymakers to the questions listed in Part 2 of the interview guide (see Appendix 1).

DENMARK

Policy development and priorities on the national and European scene

Denmark does not have any explicit national internationalisation strategy. There is a view that internationalisation is good in principle and that collaboration should occur; it has highest priority at the individual level. Agreements between governments are seen as less relevant, and have more symbolic value. Hence, barriers towards individual collaboration should be removed.

The respective organisations and national entities have more or less developed strategies for internationalisation which target different areas of the world. This cannot be called a national strategy though. The research councils are currently working to determine whether a common internationalisation strategy could be developed, but this process is not yet finalised. Denmark has identified several focus areas, including the ICT programme, nanoscience, the social sciences and humanities, the ERC, research on mobility, and the environment. The decision on this is taken at a high ministerial level. Decision-making regarding national participation in the new FP activities is not coordinated at the national level in Denmark. The participation is mainly project-based , and the individual researchers decide for themselves which projects they wish to apply for and become involved in. In this way, the national priorities are established in the research councils, mostly in the strategic research council. According to several policymakers, a more coordinated approach should be developed in Denmark, as the process is currently very fragmented.

One contrasting voice among the policymakers identified the problem of keeping the research at home so that it does not move to other countries. Maintaining a strong research base in the country is a huge challenge, made even more difficult by the fact that many researchers will soon retire and there are not enough young people to take their place. As expressed by one person: “Some other countries have a greater proportion of the population with a higher education than Denmark, so that is a challenge too.”

Experience with and challenges facing Nordic research cooperation

There is general agreement among those we have talked to that there is no such thing as Nordic added value. It can be found in some areas and on a more ad hoc-basis, such as “in some smaller areas and perhaps in social science areas”, as one interviewee stated. Another policymaker made the point that Nordic added value does exist, but not a priori: “When we need critical mass, we unite. In some areas this is needed. Then we should do it.” When the critical mass in Denmark is too small, then it makes sense to join others. The Nordic agenda may be beneficial in these cases, while in other areas it is less valuable. Another policymaker warned that within large disciplines such as biomedical sciences, Nordic cooperation is not particularly valuable; Nordic organisations should select relevant areas and not try to work in all aspects of the disciplinary spectrum.

Some interviewees noted that there is less Nordic research collaboration in the FPs than might be expected. One policymaker warned that “we should be aware that this common ground of being all Nordic countries is sometimes a bit of an illusion. We tend to believe that we are more similar than is actually the case, and there are a few not very successful business deals there as examples”. He also stressed that there is no specific common Nordic culture on

how to implement and carry out projects.

Another interviewee said that the added value is the same as at the EU level. According to several interviewees, it could be beneficial to use the Nordic area as a testing ground for wider collaboration in the EU or beyond. The added value is very limited at the concrete project level – there is hardly any money available, and the backing from national ministries and agencies is not too strong. It would be possible to create added value if the research project addressed an area of common interest at the Nordic level. If such an area were identified, it might be possible to create Nordic added value. Otherwise it would be just as beneficial to work with others outside of the Nordic region.

The fit between the FPs and national Danish R&D policy goals is generally felt to be "pretty good", in particular at an overall level (as one policymaker put it: "to build strong research environments and collaborate and so on"). There is agreement on what needs to be achieved at the EU level, and this is the same for all of Europe. Beyond this, each country decides what actions to take according to its positions and areas of strength. There is some overlap, but it is not because the FPs and the national priorities have influenced each other; sometimes there are simply common interests. The Danish research council has an independent board and makes its own priorities. Of course, this is done in consultation with the Ministry of Science, Technology and Innovation. So there are two parallel processes in which continuous communication occurs.

Some thematic areas for Nordic collaboration are mentioned in the interviews, but there is no consensus about which of these is paramount. Polar research, the Baltic Sea environment, wind power in the Arctic climate, wind power in large and scarcely populated areas, and historical studies are all mentioned, but not even these areas are uniquely Nordic; wind power is of interest to Canada, the US, China and Russia, and polar research and Baltic Sea studies also have their own and wider spheres of interest. Another interviewee mentioned higher education and improving cooperation on Ph.D.-level education, and the importance of a common Nordic approach to the Bologna Process. One interviewee found it difficult to name any specific areas for Nordic collaboration and called for a more careful analysis. Another echoed this view by stating: "This cannot be answered or solved once and for all, but rather has to be decided case by case". The Nordic countries need to seek collaboration in areas where this is fruitful. However, the research priorities are first and foremost national.

The Danish policymakers who have a view on the subject regard the Nordic Top-level Research Initiative as a promising instrument for structuring Nordic research cooperation. According to one interviewee, "It could be the starting point for a different level of Nordic collaboration," adding that it could be seen as a model or test site for some governance and collaboration models that are worth pursuing in the future. Another policymaker called the initiative "exciting" and a test case, and a third suggested that while this may not be the most optimal use of money, it is important that Nordic researchers have opportunities to collaborate. Another policymaker said it will be very interesting to follow the activities of the Nordic countries' other funding institutions and see if they will use and possibly adapt to this initiative and if they can create an intra-Nordic research base in these areas, or if the research groups and communities will use what emerges from their own interests.

Opinions varied as to whether Nordic cooperation has a role to play with regard to participation in the new_ERA initiatives under FP7 and in the shaping of FP8. One policymaker agreed that it is generally good to unite in order to be stronger and have more impact – "but we probably have different views on the respective research areas". Another thought that a reasonable level of cooperation would be for the Nordic countries to inform each other about their current research activities and priorities. One interviewee said that NordForsk could play a role in the public debate on the planning of FP8, "but not as an actor". Only one policymaker saw Nordic cooperation as crucial: "The Lund Declaration is the basis, and negotiations will

take place during the Danish chair in 2012," he noted.

So what are the main challenges for Nordic cooperation in an evolving ERA? One policymaker stated that a greater level of Nordic research collaboration will be necessary. The Nordic countries have outstanding researchers and engineers. The problem with the Nordic region as a globally competitive research arena is that the amount of resources being invested in it is too small. The thinking is that if there are some areas of common interest to the Nordic countries, then larger sums of public money should be allocated to that; the TRI is a good example of this. The ERA is a framework, and Nordic cooperation works well within that framework. It is not an either-or situation; either the EU or the Nordic region. Nordic cooperation can continue in those areas where it is already ongoing, and it could do so with even greater intensity.

Another policymaker reminded us that the Nordic countries are located on the outskirts of the ERA. It is a challenge for these countries to be visible compared with those in the centre. One task of a Nordic platform could be to work for increased visibility, but a balance between national and Nordic interests is important. National interests must be respected.

Lessons learned

Danish policymakers have a positive view of Nordic research collaboration, but they do not consider it to be a top priority or an absolute necessity. There are national interests and priorities to consider first, and the international perspective (the EU mainly, but not exclusively) has to fit in with national priorities. The Nordic level clearly takes a backseat position. Judging from the interviews, the Top-level Research Initiative could change the slightly critical view of the appropriateness of Nordic funding of research.

Quite simply, there is added value in collaboration, and the kind of alliances that ought to be built in a given situation depends on what the situation is and what one wants to achieve. This may or may not lead to collaboration with Nordic partners. The added value is not per definition always to be found in the Nordic setting, but rather in collaboration with the best researchers in the field.

For Danish policymakers, Nordic added value appears to be a useful means of furthering national interests. If a joint Nordic initiative favours Danish national interests, then it should be supported: if it does not, then it should not. The same attitude can be seen regarding FP project participation.

FINLAND

Policy development and priorities on the national and European scenes

According to the interviewees, there is no general, clear national policy for participation in the EU Framework Programmes. There are discussions and some degree of coordination at the ministerial level, but priorities appear to be set on a case-by-case basis. Most of the activity is carried out at the ministerial level and the funding agencies play an advisory role. The funding agencies such as Tekes are more involved in the practical work at the thematic level. Current policy discussions focus on the need to increase Finnish participation. Recent reports indicate that Finland's international cooperation is not as extensive as it should be. The Academy of Finland has arranged seminars with the aim of increasing participation. A new strategy is developed to trigger a new direction here.

The fit between Finnish and EU research themes was considered to be satisfactory. There are synergies in areas such as forestry, energy research, climate change, and food safety, which are on both the national and the EU agendas. It was pointed out, however, that these are important themes in many other EU countries as well.

Experience with and challenges facing Nordic research cooperation

The policymakers interviewed regarded Nordic cooperation as very important. Nordic coop-

eration offers an opportunity to create a common platform in the Nordic region and allows Nordic actors to have greater international reach. It is recognised that the small size of the Nordic countries and Nordic cooperation also have a positive impact on the national research and education system (in terms of infrastructure and administrative practices). In addition, there are certain cultural and linguistic similarities that facilitate cross-border cooperation. As one policymaker remarked, "Communication is easy, and this is an added value in itself". Several thematic areas of common Nordic interest were mentioned as being important, such as forestry, energy and metallurgic research. At the same time, policymakers recognised that top-down decisions are not the best way to convince national companies and agencies that Nordic cooperation is positive. There are many good examples of Nordic cooperation generated by bottom-up initiatives. The challenge for Nordic cooperation is therefore to capitalise on the good ideas being developed at lower levels.

More could be done to enhance cooperation with the European Commission. One example mentioned was Baltic Sea research, which was seen by several interviewees as a research field that will increase in importance in the future. Cooperation at the Nordic level is lacking in the social sciences and especially in educational research. It was stressed that all of the Nordic countries are experiencing changes in their educational systems. More knowledge in this area could therefore be useful in supporting policy decisions.

The Top-level Research Initiative on the environment, energy and climate is an effective instrument, and the thematic areas it supports are important for the Nordic countries. At the same time, it was stated that the resources allocated to it have been distributed too diffusely. It has the potential to become a very important instrument in relation to FP7.

ICELAND

Policy development and priorities on the national and European scene

Icelandic policymakers regard participation in international research activities and programmes such as the Framework Programmes and joint Nordic activities as essential. Internationalisation has been on the agenda of the Science and Technology Policy Council (STPC), the main policymaking body for research, since its inception in 2003. However, although participation in international activities has been seen as important, there has been little prioritisation and strategic thinking regarding Icelandic participation in such international arenas. The lack of prioritisation of internationalisation activities somewhat reflects the structure of the national research funding system, which is not based on thematic areas. There have been occasional initiatives with targeted funding, but none of these are ongoing and the priorities have been political and decided from the top down. As a consequence, there has been little coordination of national priorities in EU thematic areas.

During the past year, some initial steps in the direction of priority-setting have been taken, and the STPC's most recent policy strategy shows an increased willingness to set priorities. The interviews indicated that there is an increased awareness of the need to prioritise areas where Iceland already has clear strengths.

Although Iceland already participates in ERA-NET activities (such as NORFACE) and Joint Research Programmes (HERA JRP) at the research funding level (RANNIS), it was stressed that participation has been rather limited and taken place on an ad hoc basis. There has been little involvement on the part of the ministries. The problem of the Icelandic institutions' limited participation in ERA-NET activities appears to be connected to unfavourable mechanisms and a regulatory framework that hinders participation in common pot schemes. Policymakers expressed disappointment that Icelandic mechanisms do not sufficiently support participation in ERA NETs.

It is evident that the Icelandic research and innovation policy system and thinking is in a phase of reorganisation. The intention is to provide a clearer mandate on which the STPC

can take decisions. According to the STPC's most recent strategy, for the 2010-2012 period, "Recent changes in the working procedures of the Science and Technology Policy Council will strengthen its policymaking role" which implies that the "Council and its committees [will] assume a leading role in Icelandic policy making at international level". Priority-setting with regard to international participation in general and to participation in (new) EU instruments has become increasingly important as joint programming activities require that national policymakers take decisions on long-term funding commitments within specific fields. "In the future, financial decisions on common pot may be subject to approval by the STPC priorities." As one interviewee mentioned, these issues are expected to receive increased focus during the 2011-2012 period. The new approach also foresees looking into the support services for FP applicants, which are to become more effective.

With regard to the evolving FP instrument mix in relation to national needs, one perception was that the situation is becoming more difficult for participants as the projects get larger. There are fears that this situation will only worsen under FP8, exacerbating the already difficult situation that is due to the relatively few Icelandic participants in the FPs. "Another problem is that it is always the same individuals who apply, which is a delicate situation. So we want to mobilise a more diverse group of applicants."

Experience with and challenges facing Nordic research cooperation

A recent analysis of Nordic research cooperation showed that Icelandic researchers cooperate extensively with other Nordic researchers. When looking at international co-authorship links, it becomes clear that Norway, followed closely by Denmark, is the most important country for Icelandic cooperation in research. Generally, Nordic cooperation is considered to be a good thing and is being encouraged. At a more specific level some concerns were expressed with regard to the operative aspects of Nordic cooperation. Some of the issues raised included the difficulty of gaining a clear overview of what funding the Nordic level actually provides to Icelandic researchers in terms of destination and amount. The Nordic approach to strategic policy appears to be 'copy' processes initiated and administered at the EU level. These types of activities should be avoided as much as possible.

NORWAY

Policy development and priorities on the national and European scene

At a general level, national priorities for participation in the Framework Programmes are formulated in governmental strategy documents from the Ministry of Education and Research and the Research Council of Norway (RCN). However, priorities for new activities such as joint programming are decided on an ad hoc basis. Here, the RCN and the ministry have important coordinating functions for policy development. Apart from bilateral consultations with various ministries, the Norwegian ERA forum (whose mission is to promote Norway's participation in the FPs and ERA) serves as an arena for decision-making along with the EEA Standing Committee on Research.

Overall, the Ministry of Education and Research is responsible for coordinating Norway's participation in FP7 and its committees, in consultation with other ministries in and the RCN. The sectoral ministries assume responsibility for ensuring that resources and relevant research environments are available for their individual programme commitments. The links between the national research programmes funded under the RCN are crucial to decision-making on new initiatives. According to the national strategy, at least 75% of the total Norwegian FP7 project portfolio should overlap with the national research priorities. Joint programming activities must be in line with national priorities in order to be eligible for funding, and the Ministry of Education and Research cooperates closely with the sector ministries and the RCN to ensure this.

The fit between FP7 and national R&D policy goals is considered to be satisfactory at a general level. However, the 2009 white paper on research emphasises the need to improve the coordination between national research priorities and EU research priorities given the rising cost of Norwegian FP participation. Interviewees confirmed that this is indeed a challenge, but also that there is currently a very good thematic fit. However, a ministry informant found that the fit was even better for certain sub-themes under FP6 and thought that the policy relevance may have been diminished by extensive use of calls and/or third-country cooperation under FP7. Another informant in the ministries found FP7 to have a broader scope than national priorities, making some of the activities irrelevant to participants due to a lack of interest on the part of national industries. It may also be important that societal dimensions of relevance to policy are given less weight under the FPs than in national R&D policies.

Mechanisms of Nordic coordination

The process of coordinating national and FP7 priorities is considered to be a challenging task, and influencing FP priorities is seen as especially difficult. Norwegian delegates from the relevant ministries and experts from the RCN involved in this process expressed diverging views on the impact of their efforts, especially with regard to the timing of the policy process. In the beginning the delegates could more easily make their views heard, but with the enlargement of the EU to the present 27 Member States, the coordination process has become more complex. In general, according to our informants, the informal contacts related to the programme committees' activities appear to have declined in recent years.

The potential for coordinating national priorities among the Nordic countries in this context appears limited, and it takes place mainly on an ad hoc basis. Informants gave examples of areas where Nordic countries are likely to have similar priorities based on commonalities in relation to their geographical location, climatic conditions, natural resources, cultural heritage, and societal values, possibly combined with previous or ongoing research cooperation.

On the other hand, as one ministry informant noted, the time frame for coordinating Nordic priorities is limited given the rapidly developing research policy processes within the ERA and the fact that the main elements of research content are largely already settled when drafts of work programmes are presented to national delegates. At the same time, common Nordic priorities are not always easily identified, especially in fields with a limited tradition of Nordic research cooperation. The NORIA-net initiative may be of some importance to such fields. As one ministerial informant commented, any Nordic coordination of priorities will be limited in any case, due to the fact that the delegates to the FPs only represent their respective countries.

Policy for internationalisation - separate internationalisation strategy

The ministry's strategy forms an important basis for the policies on the internationalisation of research, which is a major priority of the 2009 white paper. Emphasis is also placed on bilateral research cooperation with the US, Canada, Japan, and more recent agreements with China, India, Brazil, Chile, and Argentina at the sectoral ministry level as well as on Nordic cooperative initiatives connected to the Nordic Research and Innovation Area (NORIA). The RCN strategy for international cooperation regards NORIA as a parallel to the ERA and commits the RCN to strengthening Nordic research cooperation in order to achieve critical mass, an appropriate division of labour, joint exploitation of costly research infrastructure, and enhanced scientific quality.

The RCN points out that the Nordic Centres of Excellence create synergies between the CoEs from the Nordic countries and enhance the attractiveness of and recruitment to the Nordic region. Nordic cooperation for joint programming within the ERA based on mutual Nordic initiatives is also considered to be a promising possibility in the RCN strategy. The Nordic Heads of Research Councils (NORDHORCs) may play a constructive role in developing mutual

Nordic research priorities for the future, including in relation to the corresponding EURO-HORCs and NordForsk as the facilitator of forums such as the NORIA-net initiative (which discussed mutual priorities in relation to the European Strategy Forum on Research Infrastructures (ESFRI).

Experience with and challenges facing Nordic research cooperation

Nordic added value related to research policy is in the process of being redefined. The boundary reference is shifting from a specific Nordic to an international perspective as key Norwegian policymakers point to Nordic added value as a benefit to international research cooperation beyond the Nordic level. Consequently, Nordic value is seen as a "stepping stone" to greater international cooperation in research. Nordic cooperation generates higher visibility and a platform for further international cooperation. The added value must be acknowledged in order to initiate research cooperation. Creating Nordic added value is seen as providing the stimulus needed to achieve international recognition. Parallel to this enlarged definition of Nordic added value, the delimited version which focuses on the value of cooperation for the Nordic region alone still exists among Norwegian policymakers. To some policy actors this definition may even conflict with added value from European research (policy) cooperation e.g. as one informant said, "NORIA networks have a tendency to overlap ERA-NETs with higher momentum and drive which may cause bleeding of Nordic networks".

It is a challenge to define added value from research cooperation at an aggregate level, and our informants could more easily relate to Nordic added value when asked to give examples of areas and research topics where Nordic collaboration plays/could play an important role in national research. In addition to the current Nordic priorities on climate change and eScience, other important areas mentioned include Nordic welfare models, social science databases for comparative research, clinical research, health research and registries, molecular medicine, food and welfare. Likewise, other informants stressed research connected to the geographic features and climatic conditions that the Nordic countries often have in common, such as life science and agricultural research on plant materials. Specific branch-related research not frequently addressed under the FPs, such as value chains for the food trade or social science research on transportation, were also mentioned by informants as promising topics for Nordic collaborative research.

SWEDEN

Policy development and priorities on the national and European scene

Decision-making regarding national participation in the new FP activities is not coordinated at the national level in Sweden. A vast proportion of the participation is project based, and the individual researchers decide for themselves which projects they wish to apply for and become involved in. In this way, national participation is unplanned and lacks a national strategy. As one informant said, "It is totally ad hoc".

Perhaps 90%of Swedish participation in the new instruments is of this individual, project-based kind. The rest is comprised of collaboration between governments and agencies, which is still important. The various authorities decide which instruments they want to participate in. The ERA-NETs are mentioned as an important instrument. One interviewee noted that there is a lack of people who can handle and coordinate programmes such as the ERA-NETs, and wonders whether NordForsk could play a role here and coordinate projects within selected areas. Another consequence of the absence of national monitoring is that smaller university colleges have less to gain from the FPs, as they are too weak. According to the same respondent, the larger universities have more opportunities and more to gain from participation.

Many of our respondents were critical of how the FPs have evolved over the years with regard to the constant addition of new instruments. This has resulted in an increasingly com-

plex basket of potential funding instruments, which individual researchers often find difficult to gain an overview of. It was noted that a particular new instrument may be favoured by some individual or Member State at a given point in time, and approval for the instrument is pushed through in the negotiations. It is always easier to add a new instrument than to remove one, and stricter prioritisation and focus may be needed in the future.

Still, many of the new instruments are praised by policymakers: "Instruments like this are good for societal problems that cannot be solved by one country at a time." The Baltic Sea and climate-related issues were mentioned as examples of important focus areas.

A contrasting strength mentioned by many is the establishment of the European Research Council. It was also noted that the financial growth of the FPs in general has meant that there is more funding available for Swedish researchers to apply for, which Sweden has benefitted from.

Experience with and challenges facing Nordic research cooperation

Many respondents to the questions related to Nordic added value in research cooperation said they would like to believe that there could be such a thing as Nordic added value, but they are rather unsure of how it could be defined. "There ought to be areas where a Nordic added value exists. If it is not clear which they are today, perhaps it will be clearer tomorrow." Many noted that very little Nordic research collaboration occurs within the FPs, and although it is rather easy to distinguish fields or topics where Nordic countries ought to have common interests, it is also easy to see obvious differences between the countries. In contrast, another informant said that Nordic research collaboration within the FPs is disproportionally frequent.

ICT is repeatedly mentioned as one field where the priorities and interests seem to be the same. Others are food, certain health areas, forestry and biotechnology. Research infrastructure is mentioned as one potential area where Nordic countries should join forces and cooperate more. In certain key areas where common understanding and interests can be identified, there is general support for the idea of more joint Nordic cooperation as a complement to that taking place within the FPs.

The Top-level Research Initiative was seen by several as a promising model which could be developed, expanded and replicated. Similar to the comment regarding the ERA-NETs, the idea was voiced that NordForsk could play a coordinating, leading role in creating a functioning platform for further cooperation, within or in addition to the TRI.

One informant stated:

> One reflection is that initiatives must be on that level. ERA-NETs can be another form. Hence, larger initiatives are probably the way to go, generally. The Nordic collaboration has to be part of European collaboration: they cannot be separated. Except in some very specific fields, perhaps. Now and then it is reasonable to set up a Nordic front and join forces, and act together, but this is taking place in a European context.

The ERA is playing an increasingly important role, both as a concept and as a concrete platform for action. What are the main challenges for Nordic cooperation with regard to the rapidly evolving ERA? According to many of our interviewees, the answer is to initiate Nordic cooperation itself. It is often a good idea for small countries in the EU to form alliances with others. Sometimes this can be with other Nordic countries, but it can just as well be with other countries – either with other smaller countries or with a larger country. "The Nordic countries are rather small; that matters on a European area. Small countries could now and then join forces. But it mustn't be with the other Nordic ones, it could just as well be with any small country."

There should be synergies to gain from Nordic cooperation within specific areas. The difficulty lies in identifying Nordic areas/subjects of common interest where collaboration on a

Nordic scale would be more beneficial than collaboration at a different level. Some argued that the focus should be on identifying the most important or pressing areas first and that it is important to build on existing bridges in the Nordic countries to encourage cooperation rather than competition.

Lessons learned

Many Swedish policymakers have a positive view of Nordic research collaboration, and many respondents have contributed actively to developing the Nordic research area. By the same token, they see conflicts between national interests and EU perspectives. Quite naturally, the Nordic research area as a concept tends to be thought of as a stratum between the national and the European levels. Research policy is mainly national, except for activities within the FPs, which is at the EU level. Several of our respondents noted that national priorities and interests form barriers to the development and expansion of Nordic research collaboration. Both national authorities and the European Commission have significant funding with which they direct and support research. The Nordic organisations are (1) dependent on national governance and (2) without significant financial strength. Perhaps one could (3) also argue that they are limited in their mandate, insofar as what kind of research they can support, to which extent and in which form.

Many said that there is added value in Nordic collaboration, but that there is also added value in other kinds of research collaboration between European countries or between other small countries within the EU, or for that matter, in essentially any collaborative scheme whenever this is justified and beneficial. There is added value in collaboration per se, and the kind of alliances one ought to build in a given situation depends on what the situation is and what one wants to achieve.

One lesson which could be learned from these interviews is that there is some doubt as to whether Nordic funding of research is really meaningful. There are other sources that are more applicable and better funded, such the national research councils and foundations or the range of FP instruments. There was some criticism of the increasing number of FP instruments, and yet it seemed less desirable to establish new ones at the Nordic level. Instead, the coordination of research was mentioned repeatedly as a role which Nordic organisations could take on. It was recommended that both NordForsk and NICe lead and coordinate larger projects, such as ERA-NETs or other similar projects of scale, and that they develop their role as coordinators and providers of a platform for Nordic research initiatives and other collaborative efforts.

Politicians and policymakers at the national level would then need to allow Nordic organisations to act more independently and give them latitude to implement more of their own initiatives. There are always gaps to be filled in the system. New initiatives and activities ought to be the result of an analysis of the needs, and both policymakers' and researchers' opinions should be taken into account.

CONCLUSION

This chapter focused on the existence and perception of Nordic added value, the main challenges to Nordic cooperation with regard to the ERA, and the changes in governance that may be needed. The policymakers represent a variety of the major national research councils and agencies in the five Nordic countries as well as the ministries. They commented on the issues based on their knowledge and experience. They often elaborated freely on various issues during the interviews rather than answering only the specific questions; in other words, they discussed issues that were not on the design table.

The interviews revealed several categories of commonly held views. Generally, the policymakers were relatively positive towards Nordic research cooperation. They frequently returned

to the idea that Nordic cooperation ought to be better developed and expanded due to the obvious benefits from such cooperation and the perceived similarities between the Nordic countries. They stated that there should be room for joint initiatives and cooperative ventures since the Nordic countries often have a similar view on numerous societal issues and perhaps share a certain common way of communicating and interacting. Many acknowledged that people in the Nordic countries feel a close affinity with each other, and thus feel relatively comfortable collaborating.

In accordance with this, many policymakers answered '"yes" to the question of whether there is such a thing as Nordic added value. In some cases they appeared to wish there were such a thing, or hoped that there was, but when asked for specifics, they found it difficult to provide details.

One person noted that there used to be great focus on the concept of Nordic utilisation, defined as the achievement of useful, beneficial results. However, it may be difficult to trace and measure these results. There is also a time factor involved – when were the results reached? After half a year, one year or five years? According to this respondent, Nordic added value is a more apt term, defined as research cooperation that occurs beyond the Nordic level (with Nordic participants). As Nordic partners cooperate in projects of this kind, added value is created. Added value may take the form of increased visibility, greater capacity, critical mass, and a stronger platform for future cooperation. The respondent concluded that Nordic cooperation has thus far contributed to increasing the influence of the Nordic countries on the international arena.

Networking platforms, efforts to create a united front when negotiating with the EU, and the establishment of Nordic programmes aimed at strengthening Nordic research in certain areas are a few of examples that were mentioned. It is less clear which specific areas should be targeted, but welfare, health, and forestry were mentioned repeatedly. Funding of and cooperation on infrastructure were suggested as well.

One idea mentioned was that the Nordic research community needs larger programmes or facilities around which it can unite. Goodwill and historical roots are not enough to stimulate concrete research collaboration. There needs to be a research problem to gather around, or rather a research facility, such as a centre. One person elaborated on this in relation to FP8 and the ongoing large-scale programmes within the EU:

> There are a lot of possibilities that need more focus, especially in FP8. The preparation is ongoing and it is still possible to influence it. But for the new instruments in FP7 and for the Grand Challenges it is more challenging, mainly because of the size and we don't have these kinds of international nodes/centres for R&D (like in Germany and France), which we need more of in the Nordic countries.

The quotation above points to the issue of the preparation and design of FP8 and the challenges for Nordic research cooperation with regard to the ERA. The policymakers believe it is possible to influence the design of the Framework Programmes, and they generally think that a unified Nordic front would be a strength. But again, they find it difficult to provide specifics. There are also major differences between the Nordic countries and the orientation of their respective research agendas. Perhaps most striking, however, is the fact that the Nordic countries lack well-developed strategies for their participation in the FPs. Without a national strategy, and with no distinct goals in some cases, it is rather difficult to join forces with other countries. All initiatives will therefore be taken at levels other than the national (ministerial or state agency) level. There is no point in trying to get the five Nordic countries to speak with one voice. The level of focus is wrong.

On the other hand, this opens up opportunities for those organisations that operate at

a genuinely Nordic level – not at an international level among the Nordic countries. These organisations may be able to unite the research community in specific areas and formulate common views. NordForsk and possibly other Nordic organisations have a role to play here. As suggested by some policymakers, the Nordic organisations could serve as a platform for initiatives, and the selected research areas could speak with a stronger voice when various instruments are designed within the FPs or at the European level generally. Furthermore, if this goal could be achieved, it would address the views expressed by Nordic researchers, who often are sceptical of the idea that they should collaborate simply because they are Nordic, but who would welcome initiatives related to infrastructure, seed-money, mobility, research training, and platform activities.

6. FUTURE NORDIC RESEARCH COOPERATION: POLICIES AND GOVERNANCE

This chapter provides an account of future options for Nordic research cooperation, based primarily on the responses received in part 3 of the interview guide (see Appendix 1). It also examines perceptions of the concept of 'Nordic added value' as opposed to "Added value by Nordic research cooperation in the context of the ERA and the current discussions on the Eighth Framework Programme".

DENMARK

Governance of Nordic research cooperation in the future

There is little national funding invested in Nordic research collaboration. National priorities dominate, and the national systems are heavily dependent on ministries or strong research councils. As one policymaker put it, "If there is no real money, then there will be no concrete work or cooperation". As long as the research councils manage their own funding, they will allocate it to units and individuals at the national level. This would speak in favour of Nordic coordination. Another policymaker stated that Nordic collaboration should profile itself as simple, functional and transparent - in contrast to EU collaboration.

In relation to the EU, it is also important to be aware of the differences in the systems. As one Danish policymaker reminded us, the EU has an independent commission which administers programmes and carries out its own agenda and mandate. In contrast, the Nordic countries have no similar structure, and collaboration takes place from a national perspective. When it comes to governance, initiatives are dependent on priorities at the national level.

Despite identifying the governing structure as a key obstacle to Nordic research cooperation, Danish policymakers, just like their Nordic counterparts, do not have very definite opinions about the governance of Nordic research collaboration in the future. In the view of most policymakers we spoke to, the national and international levels complement rather than conflict with each other, but it is also very clear that the EU (and beyond) comprises the relevant international level. Policy does not revolve around the Nordic level and Nordic issues. Danish priorities focus on international collaboration that favours and strengthens Danish national interests, and this sometimes means trying to establish bilateral collaborations with countries outside of the EU that are particularly strong in areas prioritised by Denmark (e.g. Israel).

Changes in governance at the Nordic level are not a top priority for Danish policymakers. "The governance model in place now is a bottom-up model, and there is no need to change it," stated one interviewee, and another noted that there is now a trend at the EU level towards more flexible solutions. The example cited was the SET Plan, in which the governance structure has been placed at the lowest possible bureaucratic level. The focus is on smaller units, and each Member State may finance its participation as it sees fit, resulting in solutions that are more tailor-made to each project. This also means that NordForsk could have a role to play. According to one policymaker, NordForsk understands what it should do, and it can deliver what the policymakers and politicians want, as long as it is given a mandate and the freedom to do carry it out. At the same time, a few of the interviewees said that the relationship between the Nordic Council of Ministers and NordForsk is a bit unclear and that the purpose of NordForsk should be clarified. One interviewee proposed a pan-Nordic Max Planck Institute, arguing that the Nordic countries are not good at funding basic research and that such an initiative would provide researchers with much better conditions. It was also pointed out that "one political initiative would do, not many – that is why the US is so strong!"

FINLAND

Governance of Nordic research cooperation in the future

The Finnish research policy priorities are now oriented towards internationalisation of the national research and education system. This places the Nordic collaboration schemes in a more central position than they have been previously, provided that Nordic research policy schemes complement the large number of ERA initiatives and actions within and outside of FP7.

Finnish policymakers are currently focusing on EU cooperation and the preparation of FP8. There is room for Nordic collaboration in many thematic areas - both as a means of coordinating participation as well as an independent Nordic initiative. Probably the most important of these are the *Grand Challenges*, a concept which is now being discussed in many different forums, such as the EC, ERA expert groups, the OECD (e.g. with particular focus on the global governance of global challenges), etc., and which gained momentum with the Lund Declaration under the Swedish Presidency. It is a challenge for Nordic national and regional policymaking to take part in shaping and providing concrete ideas for implementation, including ideas about joint programming initiatives that can be supported by most or all of the Nordic countries. It is expected that co-funding of the JPIs will be an important part of FP8.

From a more internal Nordic perspective, areas such as health research based on biobanks, forestry research and, most importantly, new Nordic infrastructures should be on the agenda of the Nordic Council of Ministers.

Regarding common research initiatives, it is important that the relevant committees in the Nordic Council of Ministers collaborate more closely together on research and innovation issues and that this collaboration on policy perspectives should be reflected in the agenda of NordForsk and NICe.

Almost all Finnish interviewees admitted that much more could be done by the individual Nordic countries and as a region to promote NORIA. The influence of NORDHORCs and of the NORIA-nets is already visible, and one interviewee suggested that the director of NordForsk should attend the NORDHORCs meetings as an observer.

ICELAND

Governance of Nordic research cooperation in the future

Some concerns were expressed about governance issues. Policies are perceived as being largely formulated from the top down. It was suggested that decision-making could be improved through more bottom-up collaboration, which would entail more involvement by researchers. “New ways to identify strong areas would be good,” stated one interviewee. With regard to prioritising areas of Nordic cooperation, it was argued that there is a need to identify just a few common Nordic issues, not all. “The Nordic countries have quite different national priorities. Acting as a Nordic block in European research collaboration is only viable where relevant.” It was pointed out that NordForsk could potentially serve as a facilitator in this regard. The Top-level Research Initiative on energy, climate and environment was mentioned as one example of a top-down policy. The areas of health and welfare were pointed out as potentially interesting areas for future funding under the Nordic Top-level Research Initiative.

It was noted that there is a lack of visibility of the Nordic funding institutions, NordForsk and NICe, and programmes were seen as problematic. Researchers in Iceland do not seem to be well informed about Nordic funding opportunities, whereas “everyone knows about FP7”. To improve visibility and to reach out to the research community, it was suggested that a specialised organisation or function be established to enhance the visibility of the Nordic funding organisations and the information provided to the research community about Nordic research funding instruments.

Moreover, concerns were raised about the future challenges of the Nordic region: “There will be more regionalised cooperation in the future, so the Nordic region should become more

important. In the beginning we were quite strong (when more countries were part of EFTA) but increasingly the Nordic voices will be less heard."

Against the rapidly changing research landscape and the urgency of responding to global challenges, some interviewees said that appropriate Nordic priorities and policies for the future are related to sustainable development, engineering, marine research and environment. Other respondents mentioned more specific areas where Nordic cooperation could be important for the future, such as climate change, CCS initiatives at the Nordic level, and renewable energy. They also said that the Nordic countries could become world leaders in social sciences research, especially on the impact of the ageing population.

NORWAY

Several of our informants pointed to *suboptimal governance* of Nordic research cooperation by the Nordic Council of Ministers and its subsidiary bodies. Lack of coordination is perceived as a weakness and a deterrent to fulfilling the potential of Nordic added value i.e. Nordic research cooperation as a stepping stone for the further internationalisation of research. The tendency of the various sectoral bodies of the Nordic Council of Ministers (NMR) to compartmentalise the research issues was seen as a major hindrance to greater cooperation and more effective policy development processes. A mutual exchange of information, such as between the civil servants who sit on the various NMR committees, was called for. "The NMR is organised in accordance with existing ministerial structures in Nordic countries which are suboptimal for organising cooperation on research and innovation. The NMR in Copenhagen should consider how this problem can be resolved," according to our source. Today a unified research and innovation policy body based on NordForsk and NICe is hardly feasible due to the poor coordination between the NMR's sectoral bodies.

Along with lack of coordination, a couple of our informants also mentioned poor *utilisation* of *the existing Nordic research and innovation policy bodies*. "The NMR and NMR sectoral bodies need to actively engage NordForsk and NICe. Today, research initiatives are also taken that *do not* involve NordForsk and NICe, which makes coordination and governance even harder. Where are the procedures, where is the holistic thinking?" one of our informants wondered, adding that "given the present governance structure, when research is involved, *engage* NordForsk; whenever innovation is addressed, *involve* NICe. And maybe the two of them after sometime will unite if the NMR committees of civil servants back off a little. Today the NMR is expending a lot of energy on budgets without getting a reasonable return," stated an informant.

However, *sectoral issues* also need to be addressed, and this provides a central rationale both for the sectoral funding of R&D activities and presents challenges for the effective governance of Nordic R&D cooperation. Sectoral ministry representatives interviewed were ready to transfer sectoral research funding to NordForsk as long as they could ensure that this funding would not be decoupled from sectoral needs by NordForsk.

By and large, the current organisation appears to be incompatible with effective coordination of joint Nordic priorities in the European FPs given the current pace of development. However, several of the Norwegian policymakers interviewed agreed that NordForsk should serve as the facilitator for the Nordic coordination of priorities on a case-by-case basis, and they pointed to the constructive role NordForsk played in the development of policies on joint Nordic research infrastructures.

An issue related to the facilitation of policy processes is the *mapping and analysis of Nordic R&D resources and potential fields and themes* for Nordic R&D cooperation in the future. One of our informants explicitly called for compiling R&D statistics across the Nordic countries, which would provide important input to policy processes.

A recurring issue for Nordic R&D governance among Norwegian policymakers was *the*

scarce amount of mutual Nordic research funding available through the bodies of Nordic Council of Ministers compared to the national research funding available in the Nordic countries. This challenge was perceived as a major obstacle to Nordic research cooperation, unless the Nordic joint programming approach – which requires two-thirds of the funding to come from national sources – proves to be successful. According to our informants, there are also policy challenges to address in this regard: "Nordic cooperation is partly limited by national priorities and readiness and limitations set by national jurisdiction on the right of disposal for national research funding above a certain magnitude."

A central policy actor interviewed also asked a fundamental question pertinent to Nordic governance on R&D cooperation: "Do we need the Nordic R&D policy bodies at all? Can *national presidencies be an alternative way of organising Nordic research policy coordination in the future?* Can the national research councils take turns assuming the presidency? This organising principle works in other settings such as in the case of EUREKA."

SWEDEN

Governance of Nordic research cooperation in the future

Swedish policymakers do not have extensive opinions on the governance of Nordic research collaboration in the future. The few opinions that were expressed pointed in different directions:

> There could be some kind of advisory board, on Nordic level, where all funding organisations are represented. And, NordForsk, perhaps with NICe and NER, could have an EU-oriented office in Oslo for instance, and join forces.
> No real opinions, but I think that it is not a good idea to limit oneself to a given region per se. Nordic collaboration, yes – but when it makes sense. Start with the issue or problem, not with a given geographical limitation. Sometimes even the EU is a bit too limited in scope – you don't consider the US or Japan/Asia enough.

A few respondents mentioned a conflict between the national and Nordic levels, and even the European level:

> Just like at the EU level: the national funding organisations don't want the Nordic level to develop into something too big. They have no interest in that. Initiatives must come from above the agency level. But politicians are elected on national level, not on the Nordic level. The national platform is there first and foremost.

National interests may be a key to understanding why the Nordic level functions well in many cases but less well in others. The obstacles result from different orientations among the Nordic countries, which are not always as alike as we often think. There may indeed be areas where collaboration is logical, but in the end each country implements its own research policy. When it comes to governance, initiatives are dependent on priorities at the national level.

One person suggested that NICe could be given a slightly different task. When targeting innovation, there are several legislative barriers, taxes, etc. which are difficult to solve and change. According to this person, NICe should focus on and fund normal collaborative projects, and thus try to make the research and innovation ends meet.

SUMMARISING THE MAIN ISSUES

National stakeholders must acknowledge that Nordic organisations must operate independently from national steering if a true Nordic platform is to be created. Thus, governance from a Nordic perspective is just as much a matter of independence from national governance as

of the establishment of governance structures within the Nordic organisations. The balance could be slightly adjusted in favour of Nordic interests without posing a threat to national research policy.

The Nordic organisations should explore developing their role as coordinators rather than as funding bodies, and focus on serving the scientific community with a Nordic platform for cooperation and exchange. An open attitude towards countries outside of the Nordic community is important; otherwise researchers will be hindered rather than supported in their research. Strict intra-Nordic collaboration is generally not seen as beneficial.

ABBREVIATIONS

Article 185 (ex Art. 169) of the Treaty on the Functioning of European Union enables the EU to participate as an equal partner in R&D programmes conducted by several Member States, combining various national and regional programmes into a single joint programme.

Article 171 Art. 171 of the EU Treaty allows the Community to set up any structure necessary for the efficient execution of research, technological development and demonstration or programmes. It allows for a wide range of possible implementation structures for Community research and development programmes, of which the most prominent is a Joint Undertaking (see also JTI).

- **ARTEMIS** Embedded Computing Systems (JTI)
- **AUTM** Association of University Technology Managers: a non-profit association of technology managers and business executives who manage intellectual property.
- **BERD** Business Expenditure on R&D
- **BONUS** Joint Baltic Sea Research Programme (Art 185 – ex 169)
- **CEEC** Central and Eastern European Countries
- **CERN** *l'Organisation Européenne pour la Recherche Nucléaire*
- **CIP** Competitiveness and Innovation programme
- **CIPAST** Citizens Participation in Science and Technology
- **COST** European cooperation in the field of scientific and technical research
- **CLEAN SKY** Aeronautics and Air Transport (JTI)
- **CREST** The Scientific and Technical Research Committee (CREST) advises the Research Council and the European Commission on issues of European RTD policy.
- **EARTO** European Association of Research and Technology Organisations
- **EDCTP** European Developing Countries Clinical Trials Partnerships (Art. 185 - ex Art. 169)
- **EFMN** Monitoring system on foresight in Europe
- **EGEEII** Enabling Grids for E-Science is the world's largest production grid infrastructure addressing 10 different areas of science, linking 50 research organisations, having started its second two-year phase in 2006.
- **ENIAC** Nanoelectronics Technologies 2020 (JTI)
- **EHEA** European Higher Education Area
- **EIB** European Investment Bank
- **EIF** European Investment Fund
- **EIMS** Evaluation Information Management Systems
- **EIRO** A collaboration forum between seven European intergovernmental scientific research organisations to pursue joint initiatives, combine resources, and share best practices.
- **EIT** European Institute for Technology
- **EMBL** European Molecular Biology Laboratory
- **EMBO** European Molecular Biology Organisation
- **EPO** European Patent Office
- **ERA** European Research Area
- **ERC** European Research Council
- **ERA-MORE** Pan-European Researchers Mobility Portal and the European Network of Mobility Centres
- **ERA-NET** European Research Area Network
- **ESA** European Space Agency
- **ESF** European Science Foundation
- **ESFRI** European Strategy Forum for Research Infrastructures, involving Member States and the Commission
- **ESO** European Southern Observatory

- **ESRF** European synchrotron radiation facility
- **ETF** Start up facility: The European Technology Facility Startup Facility aims to provide risk capital to innovative SMEs through investment in relevant specialised venture capital funds. ETF Startup will reinforce the existing facilities by targeting a segment of the venture capital market with a higher inherent investment risk, notably innovative
- **ETP** European Technology Platforms
- **EU** European Union
- **EUA** European University Association
- **EURATOM** European Atomic Energy Community
- **EUREKA** Pan-European network for market-oriented, industrial R&D
- **EUROHORCs** European Heads of Research Councils
- **EUROSTARS** Art. 185 (ex 169) initiative to support R&D performing entrepreneurs, by offering funding for their research activities, enabling them to compete internationally and become leaders in their sectors
- **EUROSTAT** European Community Statistics Office
- **FCH** Hydrogen and Fuel Cells Initiative (JTI)
- **FDI** Foreign Direct Investment
- **FP6** Sixth Framework Programme
- **FP7** Seventh Framework Programme
- **GAP** Gender Action Plan FP6 initiative to promote gender equality
- **GBOARD** Government budget appropriations or outlays on R&D
- **GDP** Gross domestic product
- **GÉANT2** A pan-European communication infrastructure for the research and education community
- **GERD** Gross Domestic Expenditure on R&D
- **GMES** Global Monitoring for Environment and Security (JTI)
- **HERD** Higher education research and development
- **ICT** Information Communication Technology
- **IISER** Integrated Information System on European Researchers
- **ILL** Institut Laue-Langevin is an international research centre of neutron science and technology.
- **IMI** Innovative Medicines Initiative (JTI)
- **INCO** Specific International Scientific Cooperation Activities: Mutually beneficial international cooperation activities between the Community and its Member States and INCO target countries and other third countries.
- **IPR** Intellectual Property Rights
- **IP** Integrated Project
- **IPTS** The Institute for Prospective Technological Studies is one of the seven scientific institutes of the European Commission's Joint Research Centre (JRC)
- **IRIM** Industrial Research Investment Monitoring
- **IST** Information Society Technologies (ICT programme in FP6)
- **JRC** Joint Research Centre
- **JTI** Joint Technology Initiatives. JTIs are long-term Public-Private Partnerships and are managed within dedicated structures based on Article 187 TFEU (ex Article 171 TEC).
- **JPI** Joint Programming Initiatives. JPIs involve EU Member States engaging voluntarily and on a variable-geometry basis in the definition, development and implementation of common strategic research agendas based on a common vision of how to address major societal challenges. It may involve strategic collaboration between existing national programmes or jointly planning and setting up entirely new ones.
- **KIC** Knowledge and Innovation Community (instrument of EIT)

- **MEDA** Euro-Mediterranean Cooperation Programme for cooperation and free exchange of goods
- **METOXIA** Metastatic tumours facilitated by hypoxic tumour micro-environments, FP7 project under the theme 'Health'.
- **MNE**'s Multi National Enterprises
- **NCoE** Nordic Centres of Excellence
- **NEF** Nordic Energy Research
- **NICe** Nordic Innovation Centre
- **NoE** Networks of Excellence
- **NORBAL** PhD statistics for the Nordic and Baltic countries
- **NORDERA** ERA-NET support action, financed by the European Commission with NordForsk as the project coordinator. Other project partners are the Nordic Innovation Centre (NICe) and the Joint Research Centre - Institute for Prospective and Technological Studies (JRC/IPTS).
- **NORIA** Nordic Research and Innovation Area
- **NORIA-net** Nordic Research and Innovation Area Network, Nordic instrument with a primary objective to create better policy coordination, synergies and joint investments within research funding and research policy at a Nordic level. There are currently seven ongoing NORIA NET initiatives (see http://www.nordforsk.org/text.cfm?id=495).
- **NORHORCS** Nordic Heads of Research Councils
- **OECD** Organization for Economic Cooperation and Development
- **OMC** Open method of coordination. Designed to help MS progress jointly in the reforms needed to achieve the Lisbon goals.
- **PLA** Peer Learning Activities
- **PPP** Public-private partnership (FP7 / ERA instrument)
- **PPP PhD programme** Nordic public-private partnership instrument. It supports PhD research projects carried out in collaboration between an enterprise, a PhD student and a university
- **PRO's** Public Research Organisations
- **R&D** Research and development
- **R&D&I** Research, development and innovation
- **RTD** Research and technological development
- **SET** European Strategic Energy Technology Plan
- **S&T** Science and Technology
- **SCAR** Scientific Committee on Agricultural Research
- **SINAPSE** A web communication platform, being developed by the Commission, in order to promote a more efficient use of scientific information and expertise in support of policymaking.
- **SME** Small and medium-sized enterprises
- **STOA** Scientific Technology Options Assessment – Assessment of Science & Technology policy options for the European Parliament
- **Tekes** Finnish Funding Agency for Technology and Innovation
- **TFEU** Treaty on the Functioning of European Union
- **TTO's** Technology Transfer Offices
- **UK** United Kingdom
- **UN** United Nations
- **US** United States (of America)
- **VC** Venture Capital
- **VINNOVA** The Swedish Governmental Agency for Innovation Systems
- **VTT** Technical Research Centre of Finland
- **WIPO** World Intellectual Property Organization

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APPENDIX 1 INTERVIEW GUIDES

Interview guide 1- Nordic policymakers

Information about the interview and interviewee

Date:		Place:	
Time:		Duration:	
First name and surname of the interviewee			
Organisation			
Telephone number		e-mail	
Profile	– Policymaker		

Career track

Q_1.1.1 About your professional experiences with R&D cooperation issues. Firstly, can you please tell me about your main responsibilities in your current position?
Answer and comments:
Q_1.1.2 How long have you been in your current position? Do you have experience from short/long assignments at international agencies (i.e. Nordic/ EU/ OECD/UN)? => What were your main tasks/responsibilities?
Answer and comments:

Theme A: Policy development and priorities on the national and European scene

Formation of national and EU research policy goals

Q_2.1.1 Can you please describe how the <national> priorities for participation in the FPs are set? Are there any overall or specific "official' targets for the size/volume or type of national participation? Hvordan blir Norges prioriteringer for deltakelsen i EUs rammeprogrammer utformet? =>Har denne prosessen endret seg fra RP5 og RP6 til RP7?
Answer and comments:

Q_2.1.2 Do you feel that it is possible to forward national viewpoints and be heard on the EU level (during the FP planning stage)? =>What are the main barriers to or preconditions for effectively influence the agenda of the FPs?
Answer and comments:

Q_2.1.3 Are there formal (delegates) or informal (experts) mechanisms of Nordic coordination in this respect? Do you see the need for a more systematic coordination of "Nordic views" in the shaping of FPs in this respect?
Answer and comments:

Q_2.1.4 How good is the fit between the FPs and <national> R&D policy goals? Please elaborate; what is the picture at a sub-thematic level? Hvor godt samsvarer nasjonale forsknings- og innovasjonspolitiske målsettinger (om internasjonalisering) med målene for EUs rammeprogram for FoU?
Answer and comments:

Q_2.1.5 (If no separate internationalisation strategy document exists): Is there a <national> policy for internationalisation? If so, what are its main components, beyond the ERA and FPs? What priority does Nordic collaboration have in this strategy - compared to other regions/countries, i.e. (US, JP, BRIC; BRA, RUS, IND, CH, etc.)?
Answer and comments:

Decision-making regarding national participation in the new FP7 activities

Q_2.2.1 How are decisions taken regarding national participation in the new FP7 activities (JTIs, articles 169, ERA-NETs, etc.) and in other horizontal activities (INCO, SME, CIP/Innovation) in the FPs? Hvordan utformes <norske> prioriteringer for deltagelsen i nye aktiviteter under EU 7RP?
Answer and comments:

(Assessment of) the evolving FP instruments mix in relation to national needs

Q_2.3.1 From a national standpoint what would you say are the main strengths and the main weaknesses of the evolving FP instruments (FP5-FP6-FP7)? We are thinking here in particular of the balance between traditional and new instruments in the FP portfolio (collaboration vs. JTI/ETPs/article 169/ etc.) Fra et nasjonalt ståsted hvilke sterke og svake sider ser du ved utviklingen av instrumentene i EUs rammeprogrammer fom. RP5? Er det mulig å definere norske og nordiske tiltak for å møte disse utfordringene?
Answer and comments:

Theme B: Experience with and challenges facing Nordic research cooperation

Nordic added value

Q_3.1.1 Nordic added value is frequently stressed in relation to Nordic cooperation in general. In your opinion, is there an added value from Nordic cooperation in research? What are the main dimensions of this added value? Nordisk nytte eller merverdi omtales ofte i forbindelse med nordisk samarbeid generelt. Er det en merverdi ved nordisk forskningssamarbeid? => Hvordan oppfatter du begrepet Nordisk nytte (hvilke hoveddimensjoner tenker du på her)?
Answer and comments:

Q_3.1.2 Could you please mention thematic areas (or topics) where you believe Nordic collaboration plays/can play an important role for national research through the FPs? Kan du nevne tematiske områder (fagfelt) hvor du tror at nordisk samarbeid kan spille en særlig rolle for nasjonale forskningsmiljøer i EUs rammeprogrammer?
Answer and comments:

Q_3.1.3 Is there a role for Nordic cooperation regarding participation in the new ERA initiatives in the FP7? What about the shaping of the FP8?
Answer and comments:

Q_3.1.4 Could you please mention thematic areas (or topics) where you believe Nordic collaboration plays/can play an important role for national research - independently from the FPs?

Answer and comments:

Future research policy challenges

Q_3.2.1 What are the main challenges for Nordic cooperation with regard to the rapidly evolving ERA?
Hva er hovedutfordringene ved nordisk samarbeid i innenfor ERA?

Answer and comments:

Q_3.2.2 Against the rapidly changing research landscape and the urgency of responding to global challenges, what are the appropriate Nordic priorities and policies for the future?
Forskningslandskapet påvirkes i økende grad av globale utfordringer (for eksempel innenfor klima- eller helseområdet). Hvilke **nordiske** (forsknings- og innovasjonspolitiske) prioriteringer og tiltak vil være sentrale i forhold til disse utfordringene i framtida?

Answer and comments:

Theme C: Governance of Nordic research cooperation in the future

Q_4.1 Do you believe governance changes are needed, => what might they look like?
Ulike sektorer har varierende erfaringer med det nordiske forvaltningsnivået (Nordisk ministerråd). Hvilke gode erfaringer dere med **nordisk** samarbeid i egen sektor?
=> Er det et behov for endringer i det nordiske forvaltningsområdet; hva bør i så fall endres?

Answer and comments:

Q_4.2 FOLLOW UP: What are the main obstacles to a more efficient governance of the Nordic R&D collaboration in terms of decision-making model, complexity/efficiency of the institutional framework, involvement of stakeholders, etc. Hvilke viktige hindringer ser du for nordisk samarbeid på forvaltningsnivået? - for eksempel i forhold til beslutningsmodell eller utformingen av institusjonelt rammeverk?
Answer and comments:

Q_4.3 The Nordic Top-level Research Initiative on climate, energy and environment is a recent and the largest joint Nordic research and innovation initiative to date. What other financing instruments (mechanisms) do you see as important for Nordic cooperation on research for the future? Det nordiske toppforskningssinitiativet for klima, energi og miljø er et nylig og den hittil mest omfattende fellesnordiske forsknings- og innovasjonspolitiske satsningen, Hvilke andre finansieringsmekanismer ser du som viktige for nordisk forskningssamarbeid for framtida?
Answer and comments:

Interview guide 2- Nordic participants in FP6/7

Basic participant information

Date:		Place:	
Time:		Duration:	
First name and surname of the interviewee			
Organisation			
Telephone number		e-mail	
Profile	– Participant FP6/FP7		
Field of research			

Q_1.1 What is your specialisation (and role) in the [selected FP7] project?
Answer and comments:
Q_1.3 What is your previous experience with the EU FPs (before FP7)?
Answer and comments:

Q_1.1 What is your specialisation (and role) in the [selected FP7] project?
Q_1.4 Have you collaborated with researchers from other Nordic countries in the EU FPs? Follow up: If yes, how did the cooperation actually take place? If not, why not?
Answer and comments:

Q_6.1 What role has your organisation/research group typically played in the different stages of your FP6/7 projects?
Answer and comments:

Drivers and motives of participation

Q_2.1 Could you please state what is/was **the most important motive** for your participation in Framework Programme projects – apart from access to research funding? (Prompt if no response: develop and extend international knowledge, improve networks, provide training, mobility of researchers, create new infrastructures, etc.) Follow up – why is/was this important to you/your organisation…?
Answer and comments:

Q_2.2 Are (any of) these motives **equally important when applying** for national (or Nordic research funding)? Follow up – Which are/are not and why?
Answer and comments:

International orientation of research

Q_3.1 In which countries are your most important (international) collaboration partners located presently?
Answer and comments:

Q_3.2 Has your research group/organisation searched for **partners from another Nordic country for FP6/7 projects?** Please describe the main motivation for your interest in collaborating with partners from another Nordic country in FP6/7 projects (if applicable).
Answer and comments:

Q_3.3 When searching for partners abroad (mainly outside the EU), is it 'useful' to be part of a Nordic research team? Generally, does Nordic participation give added value to cooperation with international organisation? If yes, can you mention any particular cases when 'acting Nordic' has brought greater benefits than acting within a national constellation only? (benefits, such as increased visibility, critical mass, etc.)
Answer and comments:

Relevance of FP6 and FP7

Q_4.1 How did the FP6 / FP7 participation support your research strategy?
Answer and comments:

Q_4.2 Has your organisation or research group adjusted its research strategies to better align with FP priorities and instruments? In what way?
Answer and comments:

Q_4.3 Considering your own research field – have you been looking for/applying for research funding from the EU due to a lack sufficient national funding in your field? In general: **how good is the fit between the FPs and <national> R&D policies/funding instruments in your field? Please elaborate; are there large differences within your thematic field?**
Answer and comments:

Q_4.4 **Generally, what would you say are the main strengths and the main weaknesses of the evolving FP instruments (FP5-FP6-FP7)?** We are thinking here in particular of the balance between traditional and new instruments in the FP portfolio (collaboration vs. JTI/ETPs/article 169/ etc.)
Answer and comments:

Impact on own organisation

Q_5.1 What impact has FP6/7 participation had (or is it expected to have) on your organisation?
Answer and comments:

Q_5.2 Did FP participation have any negative impacts on your research group/organisation?
Answer and comments:

Strategies for influencing the framework programmes

Q_6.1 Has your organisation or research group tried to influence FP6/7 **annual work programmes**, If any: please indicate in what ways? If any: How effective has these activities/ initiatives been in **improving the relevance of the work programmes** to your organisation or research group? If none: Are you aware of any other research organisation's activity that has proved to be successful in influencing FP6/7?
Answer and comments:

Q_6.2 Do you/your research group/organisation feel that national authorities can take or have taken steps to coordinate national priorities in regards to the European policies and funding instruments? Please elaborate in what way this is/could be organised/coordinated. If yes (national authorities have a role to play), do you have any good examples of this?
Answer and comments:

Q_6.3 Do you think that Nordic participants in the FPs could benefit from a coordinated effort by the Nordic agencies/representatives (e.g. NordForsk) to influence the form and content (thematic priorities, instruments) of FP6/7? Please elaborate – how could this be organised?
Answer and comments:

Q_6.4 What advice would you give to other (Nordic) participants concerning ways to successfully manage their involvement in FP projects?
Answer and comments:

Recommendations

Q_7.1 What kind of Nordic services/instrument would benefit your own organisation?
Answer and comments:

Q_7.2 Finally, can you elaborate on any other comments or suggestions for strengthening Nordic participation in the FPs?
Answer and comments:

Interview guide 3 –Nordic participants in new instruments

Basic participant information

Date:		Place:	
Time:		Duration:	
First name and surname of the interviewee			
Organisation			
Telephone number		e-mail	
Profile	– Specify participant new instruments		
Field of research			

Q_1.1 How did you find out about the opportunity to apply for funding under [this instrument]? (Were you instrumental in establishing this new instrument? If yes, how?) Follow up: Were you contacted by others or did you actively search for this opportunity (proactive or passive role)? - Contacted by whom? (Have you been contacted by national authorities with regard to this (or other) new instrument?)
Answer and comments:

Q_1.2 What is your role in the project?
Answer and comments:

Q_1.3 What is your previous experience with the EU FPs?
Answer and comments:

Q_1.4 Have you collaborated with researchers from other Nordic countries in [this particular initiative/project]? Follow up: If yes, how did the cooperation actually take place? If not, why not? Was this not a relevant/ interesting option?
Answer and comments:

Q_1.5 Do you consider [this particular funding instrument] unique in any way in relation to the funding instruments of the EU Framework Programmes? (Rationale: to identify the respondent's overall assessment of the new funding instrument in an open question format.)
Answer and comments:

Motives and benefits from participation

Q_2.1 What are the most important benefits from participating in this instrument compared to other national or EU funding instruments/funding?

Q_2.2 Could you please state what is/was the most important motive for your participation in this particular project– apart from access to research funding? (Prompt if no response: develop and extend international knowledge, improve networks, provide training, mobility of researchers, create new infrastructures, etc.) Follow up – why is/was this important to you/your organisation…?
Answer and comments:

Q_2.3 Does this funding instrument bring new opportunities to your organisation? (Does it address new thematic areas, new constellations of R&D partners, or new types of research organisation that other public or private R&D funding sources do not cover?)
Answer and comments:

International orientation of research

Q_5.1 In which countries are your most important (international) collaboration partners located presently? Why – what is your main motivation for this?
Answer and comments:

Q_5.2 When searching for partners abroad (mainly outside the EU), is it 'useful' to be part of a Nordic research team? Generally, does Nordic participation give added value to cooperation with international organisation? If yes, can you mention any particular cases when 'acting Nordic' has brought greater benefits than acting within a national constellation only? (benefits, such as increased visibility)
Answer and comments:

Relevance of the instruments

Q_3.1 How did the participation in this project [and funding instrument] support your overall research strategy (compared with other national, Nordic and EU R&D funding instruments)?
Answer and comments:

Q_3.2 Has your organisation or research group adjusted its research strategies to better align with priorities of [this instrument]? In what way?
Answer and comments:

Q_3.3 **Generally, what would you say are the main strengths and the main weaknesses of the evolving FP instruments (FP5-FP6-FP7)?** We are thinking here in particular of the balance between traditional collaborative projects versus new instruments in the FP portfolio (collaboration vs. JTI/ETPs/article 169/ etc.). Should the EU work with the development of a greater number of new instruments of the same or different kind or you would prefer that new instrument policies should enter into a consolidation phase first?
Answer and comments:

Strategies for shaping the new instruments/priorities

Q_4.1 Do you think that national authorities can or have taken steps to (efficiently) coordinate national priorities in regards to the European policies and funding instruments? Please elaborate – in what way this could be organised in better ways? Do you have any good examples?
Answer and comments:

Q_4.2 Do you think that Nordic participants could benefit from a coordinated effort by the Nordic agencies/representatives (e.g. NordForsk) to influence the form and content of similar initiatives? Please elaborate – how could this be organised? Importance of joint calls for projects (proposals) nationally?
Answer and comments:

Recommendations

Q_6.1 What kind of Nordic R&D services/instruments would benefit your own organisation? Are there lessons to be learned from the new instruments under the FP7 in this regard for Nordic policymakers?
Answer and comments:

Q_6.2 Finally, do you have any other suggestions on how to strengthen Nordic participation in the FPs and [new instrument] in particular?
Answer and comments:

NordForsk, 2011
Stensberggata 25
N–0170 Oslo
www.nordforsk.org