Choosing the right partners

Norwegian participation in European Framework
Programmes

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NIFU

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Preface

This study was commissioned by the Research Council of Norway in order to enhance the Council's knowledge about the formation, characteristics and management of successful consortia in the EU framework programmes.

Fredrik Niclas Piro has been project leader and responsible for the quantitative analyses of the report. Lisa Scordato has been responsible for the literature study and the qualitative studies involving interviews and a work shop with Norwegian researchers. Espen Solberg has chaired the workshop and together with Liv Langfeldt acted as advisors to the project, Rannveig Røste contributed to the interviews and Dag W. Aksnes contributed to the quantitative analyses.

We would like to thank Thomas Scherngell (Senior scientist at Austrian Institute of Technology) and Ernst Herlof Kristiansen (Executive Vice President, Sintef ICT) who in the early stages of the project generously contributed with knowledge about consortia in European framework programmes and methods for studying these.

We would also like to thank all informants that shared their experiences with us in our workshop and interviews.

Oslo, December, 2016

Sveinung Skule   Espen Solberg
Director   Head of Research

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Summary

The EU Framework Programmes (FPs) constitute large arenas for R&D funding and cooperation with research groups in Europe and beyond. For Norway, participation in the EU Framework Programmes (FP) has become an increasingly important dimension of national R&D and innovation policy. Current national R&D priorities are well harmonized with the European agenda, and the annual contribution to Horizon 2020 constitutes a major national investment. Against this background, it is legitimate to expect a considerable return from the participation, both in economic, scientific and societal terms.

This report describes a study where we focus on *project consortia* and their importance for success, participation and cooperation in EU framework programmes. In large parts of these programmes, joining and composing the right consortium is considered a key factor for success. The main questions behind this study is therefore: What characterises successful consortia in EU framework programmes? To what extent are Norwegian researchers and research groups able to form and join such consortia?

One key finding is that successful consortia often include a core of large institutions with high scores on conventional indicators of academic success and persistently high success in EU framework programmes. If Norway is to increase its total return from the framework programmes, more focus should be given to mobilising large Norwegian institutions to become core consortia partners and thus pave the way for a general increase in Norwegian participation and success.

The scope of this study

This study includes detailed and comparative analysis of the Norwegian participation profile in the European Union's Seventh Framework Programme (FP7) (2007-2013) and in Horizon 2020, which runs from 2014 to 2020. We analyse the characteristics of Norwegian consortia in EU FPs, compare them with the consortia from Sweden, Denmark, Finland, Austria and Netherlands, summarise stakeholders' views on the role of different kinds of support schemes in facilitating and increasing participation, and provide a review of literature on international research consortia. Focusing on consortia, the aim of this report is to understand whether the Norwegian consortia formation differs from other countries, and whether the consortia formation is a driver for higher or lower success relative to other countries.

Using data from the European Commission's ECORDA database, we study all proposals submitted under FP7 and Horizon 2020. We have left out the individually oriented programmes (European Research Council and Marie Sklodowska-Curie actions), the programmes targeting small and medium sized private companies, and EURATOM. The countries that we have chosen for comparison are nations that perform well in EU FPs. While it appears to be a common perception that Norway is

struggling in the FPs, this is certainly not what our analyses show, bearing in mind that we have excluded Norway's two weakest links in the FPs: The European Research Council and Maria Sklodowska-Curie activities. Norway's FP results are far better in the collaboration programmes.

Ten consortia characteristics

Our analysis is based on 38,955 proposals and 7,237 funded projects involving institutions from the six countries described above. By combining both application data and project data in ECORDA we are able to calculate each institution's success rate. This success measure is then seen in relation to ten characteristics of the consortia where an institution has been involved:

- The mean number of participants per application

- The centrality of the partners, i.e. their total number of unique collaborating partners in FP funded projects

- Number of applications in the FPs

- Number of funded projects in the FPs

- The success rates of the institutions

- EU funding per application

- EU funding per project.

In addition to these we have included three university characteristics:

- Number of publications in Web of Science

- Field-normalized citation index

- Rank position in the Shanghai-ranking.

These indicators reflect the consortia partners' experience in proposal writing and project participation, how successful their application efforts have been, whether they have effectively collected funding from EU, whether they are central actors in the European research network, and whether the universities in the proposals are large, highly-cited or highly reputed.

Success rates are highly correlated with the consortia indicators

The main finding is that consortia characteristics are highly associated with success rates in both FP7 and Horizon 2020, across all programmes. For example, so far, in Horizon 2020, the mean number of partners in the consortia that have received funding is 37 per cent higher in the climate programme and 44 per cent higher in the health programme compared to the number of partners in rejected proposals.

The centrality of the partners (indicating how many project partners that they have worked with in Horizon 2020 projects) is e.g. 56 per cent higher in the health programme and 48 per cent higher in the ICT programme. The mean success rate of the partners is e.g. 398 per cent higher in the ICT programme and 423 per cent higher in the climate programme.

The university partners in the funded projects are generally larger, more cited and higher ranked in the Shanghai ranking compared to university partners in the rejected applications. For example, universities in accepted proposals in the health programme have 22 per cent more publications and in the ICT programme they have 15 per cent more publications. The citation index for universities in

funded projects are 6-8 per cent higher in most programmes, while the Shanghai ranking position is 8-11 per cent higher in most programmes, and as much as 24 per cent higher in the health programme.

The institutions that have been most successful have generally two things in common: they score well themselves on these indicators, and they successfully engage in consortia where the partners in general score very well on these indicators.

Essentially, this can be explained by 1) consortia with good scores on the indicators actually do write better proposals than other consortia, or 2) consortia with good scores on the indicators have a stronger consortia CV, or 3) a combination of both.

In many ways, all these factors seem to illustrate the 'Matthew effect'. Those already on the inside of the EU FP networks benefit from their institutional reputation, their know-how on how to write proposals, their networks that they can draw upon, in addition to the fact that past participation means that they have already sustained proposal-related sunk costs. From our interviews we observed huge differences in institutions regarding their administrative support capacity for FP proposals. At some of the big units, the researchers were all very pleased with the support they got from very professional, full-time EU administrators.

The policy implication of these findings, is that the most efficient strategy to enhance Norway's return rate (and also success rate) in EU FPs, is to target the established players, already being close to the centre of the European research network. Lifting small higher education institutions, research institutes, private companies etc., up from peripheral positions, to not-so peripheral positions would not be very effective for increasing either the success rate or the return rate. The analysis in this report clearly underpins the need to concentrate the focus at those institutions that already have experience with proposal writing and project participation.

Our analysis indicates that the financial return from FPs are highly dependent on large actors with persistent success and high expertise in coordinating EU-projects. Hence, there might be a policy trade-off between on the one hand focusing on high financial return and strengthening the position of large actors, and on the other hand mobilising for a broad participation and accepting lower total financial return.

Difficult to explain Norway's relative position in light of the indicators

Whilst it is firmly established that these consortia indicators are systematically different in funded and rejected applications, they do not tell us equally much when we compare Norway to Sweden, Denmark, Finland, Austria and Netherlands.

Nevertheless, across both FP7 and Horizon 2020, some programmes/themes stand out with more stringent findings and explanations. In particular, Norway performs well and our consortia are clearly stronger than other countries' consortia in the environment and climate programmes. This is also the case in the energy programme of FP7 and in some of the more social sciences related programmes of Horizon 2020 (*Europe in a changing world - inclusive, innovative and reflective Societies* and *Secure societies - Protecting freedom and security of Europe and its citizens*).

Overall, however, we find no systematic differences in how these countries' consortia score on the ten consortia indicators. In some programmes, and for some action types, the success rates correspond rather well with scores on the studied consortia indicators. Still, in most cases the correspondence between success rates and consortia characteristics is inconclusive. We exemplify with two programmes: health and ICT.

- In the health programme of *FP7*, the success rates between the countries vary very little. Generally, coordinators in projects where Norway participates score better on the indicators than

coordinators in the other countries' proposals. The partners in the Norwegian projects on the other hand, have lower consortia scores than in other countries. Norwegian projects have in general much lower funding than the other countries' projects. At its most the difference is almost half the funding per project compared to the Netherlands. In the health programme in *Horizon 2020*, there are relatively small differences in the countries' success rates, but differences in indicator scores seem to vary systematically with the countries' project funding. Those countries with higher indicator scores than Norway have received much more funding than Norway. Norway's funding per project is only 44 per cent of what Netherlands has achieved, 64 per cent of Denmark and 69 per cent of Sweden.

- In the ICT programme of *FP7,* Norway has the lowest success rate, but the highest funding per project. Here, the general impression is that the indicator scores follow the funding (i.e. mean funding per project) - not so much the success rates. In *Horizon 2020*, this is almost completely reversed, with Norway having the highest success rate, but lower funding than Netherlands, Sweden and Denmark. Interestingly, Norway's indicator scores are not as good in Horizon 2020 as they were in FP7, but such reduction in scores is observed in all countries. Whilst the other countries have had coordinators and partners generally involved in more applications and projects compared to Norway, the Norwegian consortia contain collaborators with higher success, i.e. fewer applications, but with larger success rates.

One of the main results so far in Horizon 2020 is that Norway's success rate has fallen, while the return rate has increased (meaning fewer projects, but with more money per project). Nevertheless, in several programmes, most of the countries that we here compare Norway with are capable of extracting more money back to their countries, either because of more national partners involved in the projects, or because they are capable of building bigger projects. The policy implication of this would be that it is beneficial for Norway's overall return rate in Horizon 2020 if the key players in Norwegian research would more often coordinate larger projects. Considering that the financial incentives for taking up a coordinating role in EU consortia are weaker, it would be important to consider how incentives could be introduced at the national level which could stimulate more Norwegian researchers to take up a coordinator role.

Increased focus on impact requires search for new partners

When asking researchers from both Norway and abroad who have experience with coordinating both Framework programme proposals and projects, they stress the importance of local professional administrative support during the proposal preparation stage. The coordinators widely use and appreciate instruments targeting the project establishment phase, but given the strong emphasis on impact in Horizon 2020, more efforts from RCN in helping the consortia in finding relevant industrial partners and end-users were requested.

Some of our informants claimed that RCN instruments were too oriented towards and favouring the technically oriented disciplines. Hence, thematic NCPs should be more coordinated and be better at sharing information about their networks across thematic priorities. A further approach could be to exchange networks across funding agencies, such as between RCN and Innovation Norway (e.g. the Enterprise Europe Network). From one of our interviews we learned that the exchange of networks between research funding organisations and more user/innovation oriented agencies was done to support cooperation between actors who were not traditionally used to collaborate with each other. These "match-making" activities were arranged before the launch of calls that specifically required "untraditional" consortia constellations. Our analyses suggest that coordinators from technical fields have been much more successful in finding good industry partners, i.e. the struggle with coping with the impact concept seem more present in less technical fields, and the partner search thus ought to be more prioritized in these fields.

Generally, we see that coordinators build their consortia based on prior collaboration. Factors such as prior collaboration between partners, trust and interpersonal relationships are key factors determining partner choice. It is often the case that several of the partners in a consortium have had previous relations with the coordinator. While it is often the case that not all needed partners are known to the coordinator, new partners are often found through the networks of core partners. Given that trust and good personal relationships are central elements on which successful consortia are built, one may question the added value of partner search engines or other types of support measures targeting the selection of the core partners of a consortium. However, as mentioned before, our study found that help in finding partners whom can contribute to strengthen the impact factor of the proposal may be useful for certain actors. In these cases, search engines may provide a useful supplement to the traditional way of searching for partners.

Participants need to be backed by a well-functioning administrative support system at their institutions

Access to professional administrative support during the proposal preparation stage is perceived as crucial for landing a successful proposal. A lack of a specialised support system and an unsupportive institutional environment (e.g. unengaged leadership and/or lack of a strategy for the institutions' involvement in EU FPs) may result in weak participation and even contribute to the unwillingness of researchers to take up a coordinating role in the future. It was also mentioned in our interviews that the existence of a well- functioning administrative support system may contribute to strengthen the reputation and attractiveness of the institution and therefore increase the chances of those institutions' researchers to be (re)invited into project cooperation in the future.

A smooth administrative collaboration between partner institutions during the project phase may in some cases be equally important as the scientific collaboration. From the viewpoint of experienced coordinators, it was mentioned that positive experiences from cooperating with professional administrative departments of the partner's institutions could be decisive for renewed collaboration in future proposals. As a consequence, institutions with well- functioning administrative support systems could make those assets more visible in order to increase the attractiveness of the institution as partner in EU consortia.

Recommendations to the Research Council of Norway

Based on the findings above and elsewhere in our report, we recommend for the Research Council of Norway to follow these advice in order to promote Norway's participation in EU projects:

- Consider to concentrate the focus at those institutions that already have experience with proposal writing and project participation.

- Make the coordinator role more attractive for larger institutions.

- Give priority to help finding relevant industrial partners and end-users to the Norwegian institutions, especially those with a profile that does not concur with the Industrial Leadership profile.

- Thematic NCPs should strengthen their coordination and sharing of information about their networks across thematic priorities.

- Develop targeted strategies for teaming up Norwegian institutions with the leading research institutions of Europe, either by:

- helping Norwegian institutions to find the best available partners outside of Norway as close to the announcement of a call.

- identifying Norwegian strongholds and special areas of expertise/excellence, thus serving as a marketing agent for Norwegian institutions in the FPs, selling Norway's comparative advantages, so that Norwegian institutions become more attractive to invite into consortia.

- Make efforts in having higher education institutions, research institutions and large R&D intensive private companies administratively well-equipped in having the necessary in-house EU administrative support.

1   Introduction

The EU Framework Programmes (FPs) are large and open competition venues where forming a strong international consortium is important to succeed, both in the application process and in carrying out the projects. The aim of this report is to enhance the knowledge about the formation, characteristics and management of successful consortia in the EU framework programmes.

This study includes detailed and comparative analysis of the Norwegian participation profile in the European Union's Seventh Framework Programme (FP7) (2007-2013) and in Horizon 2020, which runs from 2014 to 2020. We analyse the characteristics of Norwegian consortia in EU FPs, compare them with the consortia from Sweden, Denmark, Finland, Austria and the Netherlands, summarise stakeholders' views on the role of different kinds of support schemes in facilitating and increasing participation, and provide a review of literature on international research consortia. Focusing on consortia, the aim of this report is to understand whether the Norwegian consortia formation differs from other countries, and whether the consortia formation is a driver for higher or lower success relative to other countries.

1.1   Norwegian participation in European research programmes

Norway's participation in the EU Framework Programmes (FP) has become an increasingly important dimension of national R&D and innovation policy. Current national R&D priorities are well harmonized with the European agenda, and the annual contribution to Horizon 2020 constitutes a major investment, accounting for more than seven per cent of the total public R&D budget in 2016. Against this background, it is legitimate to expect a considerable return from the participation, both in economic, scientific and societal terms.

Active participation and success in the EU framework programmes have often been related to the qualities of individual institutions and researchers. However, in large parts of the programmes, joining and composing the right consortium is a key factor behind success. The European Commission (2015a, p.97) states that belonging to strong networks is a key success factor for entering, and a key outcome of participation in FPs:

> *The fact of belonging to established scientific communities recognised at the European level tends to be a prerequisite to enhance the success rate of participation in FPs. Established networks of participants guarantee access to necessary knowledge for writing successful proposals, as well as to the benefit of high reputation and credibility in the delivery of high quality and sound scientific and innovation outputs. In addition to this, working in multidisciplinary teams is seen as key for both being awarded and delivering in the context of FPs*

Collaborations are seen as a key factor for constructing interdisciplinary teams with complementary competences. Well composed consortia may thus enhance the credibility of the proposals (European Commission, 2015a).

This project focuses particularly on these aspects, while recognising that the strengths of a research consortium is also highly dependent on the individual qualities and framework conditions for the partners involved.

1.1.1 Stimulus schemes for participation in EU framework programmes

Participation in EU framework projects often takes place through cooperation in larger consortia composed of actors from different countries, sectors and areas of expertise. The academic and professional requirements for each consortium are considerable. So are the administrative costs and burdens in getting engaged in a large consortium. Former evaluations of Norwegian participation in European research (e.g. NIFU STEP's evaluation of Norwegian participation in FP6 and first half of FP7 (Godø et al. 2009)), made several recommendations to the Research Council of Norway (RCN) about how to ease the process for participants, such as "Top-up" funding, strengthening the system of National Contact Points (NCP), better assistance and advice from RCN on how to achieve additional national funding of EU-projects, etc.

In Technopolis' (2012a) evaluation of RCN a few years later, it was concluded that RCN had made a significant effort to encourage and fund Norwegian researchers to take part in the FPs and other European collaborations. For instance, "Top-up" funding from RCN had enabled the research institutes to further increase their participation. Furthermore, RCN's information services and grants supporting proposal-writing were highly appreciated by the research community.

In general, the portfolio of FP support measures in Norway is now quite comprehensive and covers almost all stages of EU projects, from influence and positioning prior to calls to project implementation. According to Technopolis' evaluation of the RCN in 2013, Norwegian EU FP support mechanisms seem to be rather well developed, broad and relatively generous (Technopolis, 2013). The evaluation also concluded that the measures gave rise to significant impacts in terms of competence development, expanded networks and fostering the propensity to submit additional proposals.

Nevertheless, there seems to be a broad political agreement that the total Norwegian participation in, and return from, the EU framework programmes are below expectations and that there is potential for increased involvement in future programmes. A central question is therefore whether current support mechanisms should be strengthened further, or if other measures, strategies and framework conditions are needed.

The Government's Long-term plan for research and higher education (2015-2024) includes a commitment to increase the allocations to stimulus schemes for participation in Horizon 2020 by NOK 400 million by 2018. RCN manages most of the main instruments to support and incentivise Norwegian participation in Horizon 2020. Some of these are[1]:

- *PES2020* (project establishment support programme), supporting the development of research proposals, including travel support and support to build consortia.

- *STIM-EU*, increasing the research institute's basic funding with one third of the support received from the EU.

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[1] In addition, eight *EU Networks* were established in 2015 to support participation by increasing professionalisation, co-operation and knowledge sharing among institutions in various regions or sectors in Norway.

- *Advisory services and National Contact Points (NCPs),* where the latter are appointed for each of the themes in Horizon 2020 and provide applicants with advice regarding calls for proposals and participation in Horizon 2020.

- *RCN Workshops and open seminars,* with general advice or training in developing proposals.

- *Norwegian Contact Office for Research, Innovation and Education (NorCore),* a joint office in Brussels established in 2016 by RCN, Innovation Norway and Norwegian Centre for International Cooperation in Education. NorCore facilitates networking and contacts and contribute to advocacy and positioning work[2].

Indirectly, Norwegian participation in EU research is also being promoted by RCN's efforts in making their programmes and instruments designed so that they have a mobilising and qualifying effect on participation in Horizon 2020. The RCN also weighs joint calls or activities with European partners against national activities. Participation in EU projects are also encouraged and promoted through the performance-based components of the three block funding systems for research (higher education sector, research institutes and hospitals (Regional Health Authorities)), where EU funding is an indicator.

1.1.2   Norwegian participation and success in EU FPs – main points

Success rate is the ratio between the number of submitted applications and the number of applications that have received funding. Norway's success rate in FP6 was 25 per cent, which decreased to 23 per cent in FP7. As of June 2016, the success rate is 13,7 per cent in Horizon 2020, which is a reduction similar to that of all countries due to a marked increase in applications to Horizon 2020.

Although the total Norwegian success rate has been persistently above the European average (+1,7 per cent, June 2016), a number of challenges remain: First, compared to many other countries, the number of applications are relatively low. Second, success rates do not tell much about the total financial return from EU. Third, aggregate indicators such as total success rates do not reflect the fact that both participation and success is highly skewed and largely dependent on the success and failure of a few key actors. The latter point is probably also the case for most other countries, which underlines the importance of understanding the dynamics between institutional and collaborative qualities behind successful consortia.

In FP7, Norway's highest success rates were achieved in relatively small programmes, while the success rates were much more modest in some of the largest programmes (such as ICT), measured by total budget. The Norwegian activity was highest in programmes with significantly lower total budgets (such as the programmes *Food, Agriculture and Biotcehnology and Environment (including Climate Change)*). Sector-wise, though, there were (and still is in Horizon 2020) large differences between sectors, both in terms of participation, thematic orientation and success.

1.1.3   Norway in Horizon 2020 – ambitions and first findings

In June 2014, the Norwegian Government launched a strategy for participation in European research and innovation activities, including Horizon 2020 and the European Research Council (ERC). In the strategy, the Government declares its ambition to increase Norway's total economic return to 2 per cent of the total competitive budget of Horizon 2020, up from 1.69 per cent in FP7. As of June 2016 the total return from Horizon 2020 has risen to 1.89 per cent. The funding is rather evenly distributed across Norwegian higher education institutions, research institutes and private companies; all sectors receiving approximately one third of the total Norwegian funding.

Despite the fact that Norway's success rate in Horizon 2020 so far is lower than in FP7, the rate of return is higher than in FP7, which means that Norway participates in fewer projects but with more

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[2] In addition to this, SINTEF, NTNU and the University of Bergen opened their co-located Brussel office in 2015.

funding per project. It is important to note that these aggregate results are to a large extent explained by a few large projects, with many Norwegian actors and considerable EU-funding. Nevertheless, the 2 per cent goal has so far been achieved in several programmes:

- In most of the societal challenges programmes (2,6 per cent return rate overall):

  - Food security, sustainable agriculture and forestry, marine and maritime and inland water research (7,0 per cent)

  - Secure societies – Protecting freedom and security of Europe and its citizens (2,7 per cent)

  - Secure, clean and efficient energy (2,6 per cent)

  - Europe in a changing world – inclusive, innovative and reflective societies (2,6 per cent)

  - Climate action, environment, resource efficiency and raw materials (2,3 per cent)

The 2 per cent goal has so far not been met in the two programmes Smart, green and integrated transport (1,2 per cent return rate) and Health, demographic change and wellbeing (1,1 per cent return rate).

Under the pillar *Industrial Leadership*, the two per cent goal is achieved in all programmes except Nanotechnologies (1,3 per cent) and Information and communication technologies (1,5 per cent). Although return rates are above the targeted goal in both Advanced materials (3,2 per cent), Advanced manufacturing and processing (2,0 per cent), Biotechnology (4,9 per cent) and Space (2,2 per cent), Norway ends up with a total return rate of 1,9 per cent in the Industrial Leadership pillar, as we perform below two per cent in the ICT programme, which accounts for most of the funds.

Norway's major challenge in Horizon 2020 is found under the first pillar, *Excellent Science*, which focuses on basic science. Our return rate in the ERC is just 1,1 per cent, as is the return rate under the programme Future and Emerging Technologies. The return rate from projects in the researcher mobility programme Marie Sklodowska-Curie Action (MSCA) is 1,5 per cent, whereas we perform better in the programme for Research infrastructures (2,6 per cent). Overall, the return rate from *Excellent Science* is 1,3 per cent.

Despite the positive development in Horizon 2020, it remains an ambition for Norway to both increase the volume of applications, and to further increase the volume of granted projects and the return rate. In achieving this, at least two elements seem essential: 1) stimulate the willingness to engage in applications to EU, 2) stimulate participation in solid consortia with good prospects for EU-funding.

1.1.4 Mandate of the current study

This report is the end result of a project commissioned by the RCN, where RCN requested a study analysing the factors behind successful consortia in both FP7 and Horizon 2020. RCN listed the following elements as required for the study:

- An analysis of the literature with the aim of establishing the state of art for the field.

- An analysis of the profile of participation of Norwegian institutions compared to the participation of comparative institutions in a selection of other countries (across sub-programmes, time) focusing on whether participation rates are increasing or decreasing in terms of number of participations and funding received. The analysis should highlight the possible under-/over-performing of Norwegian institutions compared to those of other countries.

- A quantitatively based analysis of the composition of consortia with the aim of identifying possible structural characteristics of successful and less successful consortia. An analysis of how the number of proposals from a consortium and/or institutions influence the rate of success.

- An analysis of successful formation and management of consortia with the aim of identifying best practice.

- An assessment of the functioning of the support and advisory system for FP participation.

In the terms of reference, the methodology and research questions differ from past evaluation reports and official statistics on Norway's participation in European research programmes. In the current project, focus is not directly aimed at identifying Norwegian success (or lack thereof) according to the main indicators of European research – number of granted projects, success rates and financial rate of return – but rather on analysing how different aspect of collaborations may have an impact on these indicators. The dependent variable in this study is success in EUs research programmes, the independent variables are the structures and features of the consortia and the national (and local) support schemes that (may) assist them.

The overall aim of this study is to provide RCN with knowledge about:

- To what extent the Norwegian success in the European Framework Programmes depend on the composition of the project consortia;

- Which types of consortia that are highly successful, and should be further nurtured by RCN;

- The possibility of learning from academic literature and evaluations/policy analysis concerning successful international research consortia – how they are composed, structured and led – in order to enhance Norwegian participation in Horizon 2020;

- To what extent the supporting schemes at national and local levels in Norway are effective in terms of developing good consortia, as well as in assisting the consortia through the application and implementation process

The methodology that we have developed to respond to these four points is described in chapter 2. In chapter 3 we see the determinants of success from the view of the literature and researchers and research administrators, before we in chapters 4 to 6 analyse different consortia compositions across countries and sectors. A fundamental question that needs to be discussed, however, is how we can characterize (conceptually) and identify a consortium (methodologically). This will be the topic of the next section.

1.2   What does a consortium look like and how do we find it?

There are many related, but yet slightly different definitions of a *consortium.* The common denominator to all the various definitions that can be found, is that it represents a formal cooperation between several institutions that lasts for a certain period, but not for so long that it becomes a formalized entity. Rivera et al. (2010, p. 96) describe the origin of a consortium (or network, in their terminology) as people's need to collaborate with others who possesses qualities, skills, and know-how that are complementary to their own and relevant to solving a particular problem or objective. Moody (2004) points out that bringing someone new into an existing network, often springs out of the fact that it is easier to bring in a new member of the network than it is to learn new material oneself. In a European FP context, the implication of this is that as few projects focus on the exact same research question, as new calls from EU will focus on different things, and as the formal requirements outlined from EU differ between programmes and calls, etc., there are few consortia that remain identical from one application to the next. Instead, some consortiums will have a core of partners, who will be at the

center of their networks while others remain in the periphery (Rivera et al. 2010, p. 100). This is the core idea of the concept of network centrality (chapter 2.3.4).

In a network, most actors have only a few ties to other network members, whereas a small number have extraordinarily many. When analysing consortia i EU FPs, there is no database available where the applicants submitting an application have a "consortium ID". The consortium will (almost) never be the same from one application to the next (and the coordinator role of the application/project will also be taken by different institutions). In such an instance, an approach for identifying a consortium is a form of snowball sampling (Wasserman and Robins, 2012), starting the search with some known key players and look at their collaborators.

In this study, we define consortia in two different ways, where both rest on the fact that it is extremely difficult in a large database to identify the true consortia: often 2-3 core partners where some are cooperating in several projects (but not all of them may participate in each project), and a large share of one-time partners, replaced with new partners from one project to the next.

- In the main analyses (chapter 5), the consortia are analysed as the sum of all partners involved in consortia where Norwegian actors are involved. This is repeated for each country included in our analyses. Hence, we do not look at 'true' consortia, rather the sum of all partners involved, where some are at the centre – others are more peripheral partners.

- In separate analysis (chapter 6), we look at institutions that have performed persistently well in the FPs, and pragmatically consider an established consortium present when 3-4 partners are repeatedly involved in the applications.

Despite methodological difficulties, identifying the networks in FP applications is important due to the potential importance of network continuity. As stated by the European Commission (2015b, p.113), the renewal of successful projects and/or the promotion of recurring participation are potential avenues for leveraging the knowledge produced in previous framework programmes:

> *The experience in framework programmes and in collaborative research in general shows that past collaborative experiences, particularly when they involved successful projects, have a positive effect on subsequent network performance. The most effective partnerships have a shared history that facilitates collaboration through trust, established routines, and tried-and-true working policies and procedures.*

The most fundamental hypothesis of any network analysis, is that the interaction increases with geographic/physical proximity (Rivera et al. 2010). This has been studied over time at country level by e.g. Scherngell and Lata (2012). Their study documented that while geographical distance between two regions still exerts a negative effect on the collaboration probability in the FPs, the effect significantly decreased between 1999 and 2006. Thus, they concluded that the FPs had helped to increase the probability for large distance collaborations in Europe, and contributed to geographically integrated European research systems.

At the institutional level, most research on FP participation concerns the identification of central partners in the networks, i.e. the consortiums. The Europan Commission's (2015a) analysis of research performing organizations' (RPO) participation in FPs concluded that the key network players were EU-15 based, large scale organisations with a diversified portfolio of research activities. These RPOs had consistently maintained their position as top performers between FP6 and FP7, based on their number of interactions with other research performing organisations. These key network players were seen as drivers of a self-enforcing process by which RPOs that have better infrastructure and enhanced financial resources at the outset are more active in FPs and attract more financial resources, in addition to strengthening their networks of international partners. An increase in the FP funding over time to the RPOs has not been followed by a corresponding increase in the number of

RPOs that receive funding: a 230 per cent increase in funding, only led to a 0,4 per cent increase in the number of funded RPOs.

Such a 'Matthew effect' has also been demonstrated in higher education institutions (HEI). Lepori et al. (2015) analysed the characteristics of 2235 HEIs from 30 countries participating in FPs. They identified a stable backbone of organizations that are highly central in the collaboration network and account for most of the participation, much in line with what they had observed in other studies, which consistently displayed a skewed distribution with "a giant component or backbone composed by a number of organizations with high network centrality". These were primarily large and highly reputed HEIs. A group of 150 universities (out of 1000 PhD awarding HEIs) accounted for over 70 per cent of total participation in European projects in the year 2011. Similarly, the top 20 RPOs in FP7 received 41 per cent of the overall funding to RPOs in FP7 – with RPOs in France and Germany receiving 45 per cent of that total alone (European Commission, 2015a).

At country level, we can observe some movements towards more institutions being involved. But in general, the European network of collaboration in FP projects is still characterised by a core-periphery structure (European Commission, 2015b). A few countries are very central, and similar to the HEIs, these are the biggest nations in the EU: Netherlands, Spain, France, Germany and the UK. Their network centrality is very stable.

2   Methodology

The analyses in this report are presented at various levels. The aim of the study has been to present results at a sufficient low level for practical policy recommendations to be possible. The data structure has thus become quite complex; with two FPs, thirty programmes (across different action types), split on coordinator versus participant role, for six countries, with five sectors, all distinguishing between rejected and approved applications. Needless to say, a main task for us has been to present the results in a readable manner, i.e. we needed to make extensive efforts in data reduction. Therefore, not all numbers are presented in this report. Mostly, we present the results as ratios, where the Norwegian values represent the baseline.

2.1   Study sample

Norwegian consortia are being compared with those of six countries. We have chosen countries for comparison based on their comparability with Norway in terms of size and economic development. We chose countries according to two size levels: three small countries (Sweden, Denmark and Finland) and two medium sized countries (Netherlands and Austria).

In this way, we end up with the five countries regularly used in Norway for such comparisons (the so-called barometer countries in Norway's annual *research barometer*). These countries include some of the best performing countries in Horizon 2020 (in terms of success rates), and should therefore provide a good basis for benchmarking and for analysing the characteristics of good consortia and success in the EU FPs.

2.1.1   Studying both applications and project participations

Enger & Castellaci (2016) argue that a limitation in most analyses of European FP participation, is the focus on the sub-sample of applicants only, while neglecting all other organizations that have not participated in applications. This is of course due to limitations in data availability. Likewise, the focus-only on those who participate in EU funded projects, often conclude that the central network players (such as large research institutes) and highly reputed universities are the key institutions, and those with the highest success. These analyses however, do not take into account that these are large units and should *a priori* be involved in larger number of applications, inevitably leading to many more funded projects.

The dependent variable in this report is *success* in EU FPs, and we want to investigate whether different consortium compositions between Norway and other countries may explain differences in *success rates.* Hence, success in terms of output of the projects is not the focus of our report, it is rather whether or not a consortium has successfully achieved funding from EU. However, in some of

the qualitative analyses of our report we will also study characteristics of the coordinator and the consortia that are important in conducting good projects (see chapters 2.5 and 2.6). The quantitative analysis (see chapters 2.1.2, 2,2 and 2.3) will only consider success in terms of the consortia ability in getting their applications funded by the EU.

2.1.2 Thematic areas and programmes

Activities under the European Research Council (ERC), Marie Skłodowska-Curie actions (MSCA) and instruments targeting SMEs have been kept out of the study, as indicated in the terms of reference (in addition to this, we have excluded EURATOM, where Norway is not formally represented). The rationale is that focus should be on the programmes with high degree of international cooperation. Furthermore, we have limited our analyses to three key sectors:

- The higher education sector (HES)

- Research organisations (REC)

- Private for profit enterprises (PRC)

Public body companies (PUB) and other institutions (OTH) *are* included, but only when we present total numbers (for a country or a program), no data at sector level is presented for these two sectors. There are many ways to justify such a decision. One is that these sectors are small and their share of participation in FP applications and projects have decreased over time. In FP6 these two sectors' shares of project participants were 27 per cent, but only 14 per cent in FP7 (European Commission, 2015b). Also, in Norway they receive only around ten per cent of Norway's total funding. Our study looks at both FP7 and in Horizon 2020 programmes. We wanted to conduct analysis with a sufficient number of units in each programme, while at the same time breaking down the numbers at the lowest possible level, so that the uniqueness of the programmes as far as possible would remain unaggregated with other programmes. One example is the thematic area *Excellent Science* in Horizon 2020 which features the programmes *Future and Emerging Technologies* and *Research Infrastructures.* Since a large number of applications have been submitted to both of these, meaningful analyses can be made, and they will be treated separately. By contrast, we find the thematic area *Spreading excellence and widening participation* which contains five programmes, where four of them had hardly received any applications at all at the date when we downloaded the data for our analysis (see chapter 2.2). In such a case, all programes will be analysed as one thematic areas, despite consisting of five smaller programmes. Table 2.1 summarises our classification schemes of the programmes.

Table 2.1: Classification of thematic areas and programmes for our study

Horizon 2020	Our classification
Spreading excellence and widening participation	Spreading excellence and widening participation
ERA chairs	
Spreading excellence and widening participation – Cross-theme	
Teaming of excellent research institutions and low performing RDI regions	
Transnational networks of National Contact Points	
Twinning of research institutions	
Excellent Science	
Future and Emerging Technologies	Future and Emerging Technologies
Research Infrastructures	Research Infrastructures
Social challenges	
Climate action, environment, resource efficiency and raw materials	Climate action, environment, resource efficiency and raw materials
Europe in a changing world - inclusive, innovative and reflective Societies	Europe in a changing world - inclusive, innovative and reflective Societies
Food security, sustainable agriculture and forestry, marine and maritime and inland water research	Food security, sustainable agriculture and forestry, marine and maritime and inland water research
Secure societies - Protecting freedom and security of Europe and its citizens	Secure societies - Protecting freedom and security of Europe and its citizens
Secure, clean and efficient energy	Secure, clean and efficient energy
Smart, green and integrated transport	Smart, green and integrated transport
Health, demographic change and wellbeing	Health, demographic change and wellbeing
Science with and for Society	
Develop the governance for the advancement of responsible research and innovation	Science with and for Society
Integrate society in science and innovation	
Make scientific and technological careers attractive for young people	
Promote gender equality in research and innovation	
Science with and for Society - Cross-theme	
EC: Cross theme	Not included
Industrial Leadership	Industrial Leadership
Access to risk finance	
Advanced manufacturing and processing	
Advanced materials	
Biotechnology	
Industrial Leadership - Cross-theme	
Nanotechnologies, Advanced Materials and Production	
Space	Industrial Leadership - Space
Information and Communication Technologies	Industrial Leadership - ICT

FP7	Our classification
Cooperation projects	
Energy	Energy
Environment (including Climate Change)	Environment (including Climate Change)
Food, Agriculture, and Biotechnology	Food, Agriculture, and Biotechnology
General Activities (Annex IV)	Not included
Health	Health
Information and Communication Technologies	Information and Communication Technologies
Joint Technology Initiatives (Annex IV-SP1)	Joint Technology Initiatives (Annex IV-SP1
Nanosciences, Nanotechnologies, Materials and new Production Technologies	Nanosciences, Nanotechnologies, Materials and new Production Technologies
Security	Security
Socio-economic sciences and Humanities	Socio-economic sciences and Humanities
Space	Space
Transport (including Aeronautics)	Transport (including Aeronautics)
Capacity	
Activities of International Cooperation	Activities of International Cooperation
Coherent development of research policies	Not included
Regions of Knowledge	Regions of Knowledge
Research Infrastructures	Research Infrastructures
Research Potential	Research Potential
Science in Society	Science in Society

2.2 The ECORDA database

The main data source in this study is the European Commission's data warehouse ECORDA, covering FP7 and the early phase of Horizon 2020. As we will describe below, we have used the November 2015 edition, which means that our FP7 data are complete, whereas the analysis of Horizon 2020 is restricted to only the early results of that framework programme. This means that our Horizon 2020 data are not up to date, and that numbers presented here will be very different from what the results look like at the time of writing this report. Since the purpose of our report is not to present updated results from Horizon 2020, but rather to investigate a specific research question related to cooperation patterns, we do not see this as a problem. However, our results should not be used for documentation of Norwegian results in Horizon 2020, as the numbers we present are outdated. There is also the possibility that as Horizon 2020 was introduced, different requirements compared to FP7 led to new ways of forming consortia, writing applications and so on, which may one the one hand have caused several acts of stumbling from even experienced FP participants, and on the other hand opened up for new actors e.g. from the public sector. For those who struggled in the first rounds of Horizon 2020, the work on proposals may now have become more acclimatized and adapted to the new requirements.

The November 2015 edition of ECORDA had to be used, as our study is based on analyses where we follow each institution involved in FP applications and projects throughout 2007-2015. In doing so, there was a need for a cleaning/standardization of the ECORDA data. The *project database* of ECORDA is of quite good quality regarding the standardization of institutional names. The problem is the quality of the application databases for FP7 and Horizon 2020, where the standardization of institutions is both incomplete and of poor quality. NIFU has long experience, and sound techniques, on how to standardize institutions in large databases where information is not standardized (in this case: the names of the institutions). At NIFU, a complete standardization of all institutions in ECORDA was carried out in the period January – June 2016, involving 1.1 million institution names (all

applicants and grant receivers). This has enabled us to extract data about all institutions' total volume of applications and projects, thereby making it possible to calculate success rates for all institutions in the database. To our knowledge, this detailed standardization of ECORDA is unique.

The sector classification in ECORDA is also very incomplete, i.e. multiple sectors are assigned for many institutions. Our reclassification uses the same sectors as those already at place in ECORDA, but approximately 10 per cent of the institutions' sector affiliation has been changed (e.g. University of Oslo was listed as both PUB and REC in ECORDA, in addition to its obvious affiliation – HES). It is also a problem in ECORDA that two institutions, from two different countries – may be mainly assigned to one sector only, but to two different sectors across countries. For example, in many countries a research council is considered a PUB, whereas in others, it's considered a REC. In this specific example, we draw the line between whether a unit is performing research itself (thereby a REC), or whether it funds research (thereby a PUB). The sectors we use are:

- Higher education (HES)

- Research organisations (REC)

- Public body (excluding research and education) (PUB)

- Private for profit (excluding education and including the following sub-group: small or medium-sized enterprises (SMEs)) (PRC)

- Others (OTH)

In addition to these we tried, but ultimately failed, in creating a sixth sector: hospitals. Such a classification proved to require language and local knowledge for each country that we do not have. In many countries the hospitals may easily be detected by their names, while in others they are found under entities such as foundations, public agencies, etc. In official R&D statistics it is common to assign university hospitals to the HES sector, but we have chosen to assign all hospitals to the REC sector. In Norway, university hospitals are easy to locate (to us) and assign to the HES sector, while other public hospitals are assigned to the REC sector. However, there are large variations in namings (and sector affiliation being used in ECORDA) for hospitals in other countries. The hospitals under NHS in the UK, for example, are inconsistently being assigned both HES, REC and PUB sectors in ECORDA. In other countries, hospitals with a university name in it are often classified as REC, while hospitals in languages we are unfamiliar with, but seemingly with no university title attached to them, are assigned to the HES sector. This inconsistency drew us to consistently assign hospitals to the REC sector. This is not in line with standard OECD manuals, but is in line with some of the aspects that the RCN wanted us to look into in this report: whether or not Norwegian consortia have different university partners compared to other countries. By excluding all hospitals from the HES sector, we will be operating with a consistent set of higher education institutions only, i.e. universities, universities of applied sciences and university colleges.

2.3   Main indicators

The dependent variable in our analysis is a country or a sector's success rate in the different programmes of FP7 and Horizon 2020 (cf. the classification in Table 2.1). The success rate is the ratio between the number of submitted applications and the number of applications that have received funding.

For each submitted application, we calculate ten indicators based on the consortia members' experiences *from the same programme that the current application is submitted to.* For example: when we analyse consortia with Norwegian participation in the Security programme of Horizon 2020, we estimate the number of applications, funding and so on that the partners have had in this particular programme. Although, it would be desirable to use their records of all applications, funding and so on in all security related programmes in other programmes in both current and past FPs instead, there are several methodological reasons behind our choice:

- Institutions' results in FPs should be split by programmes, because it makes little sense to say that a university is a solid partner in the Energy programme because it has a great overall success rate in the FP, when most of the activity is perhaps in the Health and ICT programmes.

- Although some of the FP7 programmes are possible to compare with the Horizon 2020 programmes, others are not. And it may be several partnerships operating in several seemingly non-connected programmes. For example, in Horizon 2020 cross sectorial research is highlighted more than in previous FPs. It is therefore not unusual for funds from several themes to appear in the same calls, that do not coincide with the programme structure. Health, ICT, environment, climate and energy are just some examples of this. In August 2016, less than half of the funding that Norway had received in health research came from the Health programme; the rest came from other programmes in Horizon 2020. This is also the case for ICT in relation to the LEIT ICT programme, while an even smaller share of the funds for climate and environment research has been channelled through the Environment programme (Research Council of Norway, 2016).

Therefore, the only consistent way of calculating consortia scores would be to do so for all programmes separately. These calulcations are based on ECORDA data. In addition to this, we have merged ECORDA with data from the Shanghai ranking and the Leiden ranking produced by CWTS (Centre for Science and Technology Studies at the University of Leiden). Here, the universities' scores will be the same in all programmes, because a university ranked e.g. 75 in the Shanghai ranking and having a citation index of e.g. 1,25, has so regardless of which programmes we are studying. CWTS does provide citation scores by scientific fields, but they are few fields and not possible to correctly match each EU programme with one of these fields.

The rationale for using data from university rankings was that the RCN suggested that the analysis of how the consortia are composed should also reflect the research quality or the reputation of involved partners. Unfortunately, such data can only reflect higher education institutions, because no systematic data about research institutes', public sectors' or business enterprises' publication and citation data are available at the international level. Looking at the universities' reputation was done by Lepori et al. (2015) who, first, observed from former studies, that the participations in FPs are strongly concentrated in the most reputed universities, and that organizational characteristics, particularly size and reputation, influenced the number of participations. This study measured *reputation* as the product between the normalized impact factor and the total number of publications from the concerned HEI. The authors claim that the numbers of participations is expected to increase with the HEI reputation, because at the individual level, the acquisition of research funds is strongly correlated with the researcher's reputation, which matters more than proposal quality in the selection process (the authors cite studies by Viner et al. 2006; Laudel 2006, van den Besselaar and Leydesdorff 2009), whereas in

collaborative research, higher-reputed researchers and organizations will be sought to a greater extent as research partners, and will therefore move to the centre of the network.

2.3.1 The shanghai ranking (ARWU)

The relevance and quality of university rankings are highly disputable (Piro et al. 2014; Piro & Sivertsen, 2016), but they are well-known and may be (mis-)used to investigate the "quality" of a potential partner or applicant. Despite this, few would disagree that the universities ranked at the top in these rankings are universities of very high quality. At least in terms of research activities, as teaching activities are poorly covered in the data typically used to rank universities. We may claim that the rankings are capable of identifying the best universities of the world, but fail in discriminating between the "normal" universities (who, after all, do account for most universities in the world). Here, we compare the consortiums' higher education institutions based on their ranking in the Shanghai ranking (ARWU), which is a ranking far more research oriented than other famous university rankings such as QS or the Times Higher Education.

The universities in ARWU have been assigned a mean value of their rank position in the years 2003-2014. Many higher education institutions (HES) found in ECORDA, however, are not included in ARWU. These are typically smaller institutions, as ARWU operates with a minimum number of scientific publications per year for it to be considered in the ranking. It would be highly misleading to ignore these institutions when calculating mean ARWU scores for the consortia. Imagine two consortia, with one having two universities: A German university ranked 80 and an Italian university ranked 450 in ARWU. The mean ARWU value for HES institutions in this consortium is thus 265. Then, imagine another consortium with a Spanish university ranked 250 and five very small (and to most people, unknown) universities from Spain, Greece, Morocco, Malta and Cyprus. If the universities that are not included in ARWU are just ignored when the mean ARWU value is calculated, this consortium would end up with the highest ARWU value, which would be highly misleading. We have therefore chosen to give all HES institutions that are not included in ARWU the value 800, which is 200 positions lower than the lowest ARWU rank position (600). In the whole ECORDA database we have identified a total of 6334 HES institutions.

Table 2.1: Mean ARWU values (2003-2014) for Norwegian and the top ten universities

Position	University	Country	Mean Position
1	Harvard University	USA	1
2	Stanford University	USA	2,2
3	University of California, Berkeley	USA	3,5
4	University of Cambridge	UK	4,2
5	Massachusetts Institute of Technology (MIT)	USA	4,3
6	California Institute of Technology	USA	5,9
7	Princeton University	USA	7,2
8	Columbia University	USA	7,8
9	University of Chicago	USA	9,2
10	University of Oxford	UK	9,7
65	University of Oslo	Norway	67,6
244	Norwegian University of Science and Technology	Norway	256,9
288	University of Bergen	Norway	297,2
434	Univ Tromsø	Norway	478,2

In the period we have covered, Harvard University has always been ranked as number one, while the University of Oslo is the best Norwegian institution with a mean rank of 67,6 (Table 2.1). Only the

traditional four Norwegian universities have been part of ARWU, which means that universities in e.g. Agder and Stavanger, and all university colleges end up with an ARWU value of 800.

2.3.2 Number of publications

While ARWU measures a university's international reputation, the Leiden ranking has data on the publication volumes of the world's largest universities. Lepori et al. (2015) investigated whether the number of participations in FPs is expected to increase with the *research capacity* of the organization. They postulated that organizations with more research capacity have more research teams (possibly also covering more research topics), and therefore engage in more collaborations. Since we do not have institutional data for the HEIs in the database – we use the number of scientific publications as a size indicator.

All HES institutions that are found in the Leiden ranking have been given a value representing their mean number of fractionalized scientific publications during the years 2011-2014. The Leiden ranking does not provide numbers further back in time. 698 universities included in the Leiden ranking were found in ECORDA.

Figure 2.1: Geographic distribution of universities included in the Leiden ranking

Source: www.leidenranking.com

As we can observe in Figure 2.1, a very large share of the universities represented in the Leiden ranking are from USA, China and other countries outside Europe. This means that the number of European universities included is rather modest, and that we do not have information about their publication activity. In reference to the discussion about missing values in ARWU (chapter 2.3.1), we have decided to give HES institutions that are not included in the Leiden ranking a fixed value. It has been set quite low: 100 publications on average during the years 2011-2014.

Table 2.2: Mean number of fractionalized publications (2011-2014) in the Leiden ranking for Norwegian and the largest ten universities

Position	University	Country	Mean number of publications
1	Harvard University	USA	29106,4
2	University of Toronto	Canada	18440,8
3	University of Michigan	USA	16248,7
4	University of Tokyo	Japan	14461,1
5	Johns Hopkins University	USA	13811,9
6	University of California, Los Angeles	USA	13683,1
7	University of Washington	USA	13223,6
8	Stanford University	USA	12996,0
9	University of Sao Paulo	Brazil	12557,3
10	Zheijang University	China	12062,1
125	University of Oslo	Norway	5259,9
258	Norwegian University of Science and Technology	Norway	3270,9
280	University of Bergen	Norway	3066,4
545	University of Tromsø	Norway	1428,2

As we see from Table 2.2, the fixed value 100 is very low compared to e.g. the University of Tromsø, ranked 545 by its size of publication volume. The lowest publication volume of universities in the Leiden ranking is 446,19, while the mean value is 3421,3. University of Tromsø is thus well below the mean of all universities in Leiden ranking, but must still be considered a rather large university compared to e.g. all other Norwegian HES institutions that are not included in the Leiden ranking. Many of the HES institutions – worldwide – that we do not find in the Leiden ranking are very small universities of applied sciences, small technical schools and other college-like institutions where 100 publications may in fact be a much to high number.

2.3.3 Mean normalized citation score (MNCS)

Whilst ARWU measures reputation, number of publications measure size, our third university indicator is a citation indicator used as a proxy for scientific outreach and impact. We use the mean normalized citation scores (MNCS) of the Leiden ranking. The MNCS is the average number of citations of the publications of a university, normalized for differences between scientific fields (i.e., Web of Science subject categories), differences between publication years, and differences between document types (i.e., article, letter, and review). An MNCS value of 1,00 can be interpreted as the world average (or more properly, the average of all WoS publications). Consequently, if a university has an MNCS value of 2,00, this means that the publications of the university have been cited twice as much as the world average. We refer to Waltman et al. (2011) for a more detailed discussion of the MNCS indicator.

As clearly seen in Table 2.3, American universities dominate the list of the most cited universities, with Norwegian universities only slightly cited above the world average, and the University of Tromsø, ranked 434, is cited ten per cent below the world average. The mean value of all universities' MNCS score is 0,98, with the lowest value among the 698 universities being 0,53.

Table 2.3: Mean normalized citation scores (MNCS) (2011-2014) in the Leiden ranking for Norwegian and the ten most cited universities

Position	University	Country	Mean MNCS
1	Massachusetts Institute of Technology (MIT)	USA	1,98
2	Harvard University	USA	1,81
3	Princeton University	USA	1,81
4	California Institute of Technology	USA	1,80
5	University of California, Berkeley	USA	1,78
6	Stanford University	USA	1,76
7	University of California, Santa Barbara	USA	1,69
8	University of California, San Francisco	USA	1,59
9	London School of Hygiene & Tropical Medicine	UK	1,57
10	Rice University	USA	1,57
244	Norwegian University of Science and Technology	Norway	1,03
265	University of Oslo	Norway	1,03
288	University of Bergen	Norway	1,02
434	University of Tromsø	Norway	0,90

All HES institutions that are not part of the Leiden ranking has been provided a fixed MNCS value of 0,4. This is more problematic compared to the fixed value for the number of publications, because citation scores do not necessarily follow size. Small institutions may be more cited than big institutions and vice versa. But as a general rule, and because many of the HES institutions found in ECORDA are either very small or non-research driven, we believe the general rule should be that their citation score is lower than for the larger universities found in the Leiden ranking.

2.3.4 Centrality

In earlier chapters, with reference to several studies, we have described the skewed nature of FP participation with some institutions being very central and involved in a very large number of projects. Institutions that are involved in multiple partnerships are thereby *a priori* also involved in collaborations with many partners. The European Commission (2015b, p.111-112) describes the central players in the network with almost a sense of brutality:

> *While the larger players can pick and select their collaborators and with whom they share information, the peripheral actors are highly dependent, have comparatively little negotiating power, and are frequently left in the dark. They are simply not on the preferred information paths….the importance of large 'information exchanges' such as the CNRS, CNR, Fraunhofer, and large prestigious universities such as Oxford. In this, larger organisations gain more power, as they increasingly play a key role.*

Some institutions are thus at the centre, and it will be important to other institutions to position themselves towards the centre, where the most obvious strategy is to try to get into the consortia involving these key actors, or to bring some of these key actors into their own consortia. We have calculated a centrality indicator, which measures the number of unique project partners (in funded projects) each institution has within each programme of FP7 and Horizon 2020. This means that:

- An institution that has applied, but never successfully been funded by EU, has a centrality value of zero.

- An institution may end up with a very high centraliy score in one programme, and a very low score in another.

The centrality score is calculated as ratios of the institution with most collaborative partners in EU funded projects. The highest centrality score is thus 1.00, and all other institutions will have values between 0 and 0,99. As we can see from Table 2.4 the leading network institutions in the FPs are primarily very large research institutes in Germany, France and Spain.

Table 2.4: Institutions with highest centrality scores per programme

Country	Institution	Programme
DE	Deutsches Zentrum fuer Luft- und Raumfahrt e. V.	Activities of International Cooperation
FR	CNRS	Climate action, environment, resource efficiency and raw materials
DE	Fraunhofer	Energy
EU	Commission of the European Communities - Directorate General Joint Research Centre - JRC	Environment (including Climate Change)
DE	Deutsches Zentrum fuer Luft- und Raumfahrt e. V.	Europe in a changing world - inclusive, innovative and reflective Societies
FR	Institut National de la Recherche Agronomique	Food security, sustainable agriculture and forestry, marine and maritime and inland water research
NL	Stichting Dienst Landbouwkundig Onderzoek	Food, Agriculture, and Biotechnology
FR	CNRS	Future and Emerging Technologies
FR	INSERM - Institut National de la Santé et de la Recherche Medicale	Health
FR	INSERM - Institut National de la Santé et de la Recherche Medicale	Health, demographic change and wellbeing
DE	Fraunhofer	Industrial Leadership
DE	Fraunhofer	Industrial Leadership - ICT
DE	Deutsches Zentrum fuer Luft- und Raumfahrt e. V.	Industrial Leadership - Space
DE	Fraunhofer	Information and Communication Technologies
FR	Commissariat à l'Energie Atomique (CEA)	Joint Technology Initiatives (Annex IV-SP1)
DE	Fraunhofer	Nanosciences, Nanotechnologies, Materials and new Production Technologies
HU	INNOVA Észak-alföld Regional Development and Innovation Agency Nonprofit Ltd.	Regions of Knowledge
FR	CNRS	Research Infrastructures (FP7)
FR	CNRS	Research infrastructures (H2020)
ES	Spanish National Reseach Council (CSIC)	Research Potential
EE	University of Tartu	Science in Society
DE	Deutsches Zentrum fuer Luft- und Raumfahrt e. V.	Space
DE	Fraunhofer	Spreading excellence and widening participation
DE	Deutsches Zentrum fuer Luft- und Raumfahrt e. V.	Transport (including Aeronautics)
DE	Fraunhofer	Secure societies - Protecting freedom and security of Europe and its citizens
ES	TECNALIA, Fundacion Tecnalia Researcg & Innovation	Secure, clean and efficient energy
DE	Fraunhofer	Security
DE	Fraunhofer	Smart, green and integrated transport
BE	Université catholique de Louvain	Socio-economic sciences and Humanities

Two institutions' high centrality score may appear surprising. Hungary's INNOVA Észak-alföld Regional Development and Innovation Agency Nonprofit Ltd. has the highest number of unique project partners in the programme Regions of Knowledge and University of Tartu has the highes number of unique partners in Science in Society.

2.3.5   Number of applications and projects

Experience from former applications and projects may have strong influence on success in the future. Lepori et al. (2015) argue that current participations in FPs largely generate new ones, because they are borne from existing collaborative links. Likewise, among Spanish private companies, the probability of getting funding in (the late editions of) FP7 was documented as higher for firms that had already participated in projects in the early phase of FP7 (Barajas & Huergo, 2007). It is reasonable to argue that the more experience a partner has from being involved in proposal writing, the more likely it is that the partner is able to give input into the application that may strengthen its prospects for getting funding. Likewise, because of the Matthew effect, partners with experience from past projects will also strengthen the chance for an application to be accepted for funding.

We have therefore calculated each institution's number of applications and project participations in each programme, cf. Table 2.1.

2.3.6   Success rate

Based on the number of applications and project participations, we calculate each institution's (as well as sector's) success rate in each programme, cf. Table 2.1.

Success rates do not however give any information about how much funding an institution has received, and if not supplied with additional information about funding levels, it may lead to inexpedient conclusions. For example, a very small Eastern European technical university has a very high success rate in the programme *Environment (including Climate Change).* This is based on seven applications of which three received funding from EU (43 per cent success rate). In the same programme one of the world's largest and most prestigious universities from United Kingdom had a considerably lower success rate (27,5 per cent), but the funding level is completely different. While the Eastern European university on average received 90,700 euro per project they were involved in, the British university on average received 578,950 euro for each of their projects. We have therefore also calculated the mean number of EU funding per application (chapter 2.3.7) and mean number of EU funding per project (chapter 2.3.8).

2.3.7   EU funding per application

This indicator is calculated as the total volume of EU funding divided by the total number of applications. For each institution it is calculated for each programme separately, cf. Table 2.1. The indicator should be seen as an equalizer of the phenomenon of an extraordinarily high application volume in some institutions that may lead to rather high funding volumes. Such a 'financial success', however, may rest on an ineffective application activity.

2.3.8   EU funding per project

This indicator is calculated as the total volume of EU funding divided by the total number of funded projects. For each institution it is calculated for each programme separately, cf. Table 2.1. The indicator should be seen as an equalizer of the phenomenon that some institutions are involved in many projects, but do not have a central role, seldom/never has the coordinator role, and their rate of return is low.

2.3.9   Number of partners

Our final indicator, is the number of partners per application. In theory, a high number of partners in a proposal may both increase and decrease the chances for successfully getting funding from EU. Many partners may strengthen both the institutional CV of a consortium as well as its skills and capabilities. On the other hand, too many partners can make the consortia more difficult to manage. The hypothesis is nevertheless that the larger, central network players are involved in larger consortia with

more partners, partly because their large networks and research/administrative capacities enables them to manage such large consortia.

2.4   Identifying successful consortiums

In chapter 5 we compare the consortia of six countries. This analysis includes all consortia, whereas in chapter 6 we turn to the most successful consortia, trying to identify key characteristics of these, and compare them with how 'ordinary' consortia look like.

As stated in chapter 1.2 it is difficult to identify the 'true' consortia in ECORDA, and our methods which we describe here do not solve these, so that when we study 'successful consortia', what we actually do is to study successful organizations. The breakdown of the data by programmes will to some extent solve the problem, but still:

- When we look at a university's involvement in projects in for example the ICT programme, there will be several research groups that are involved from that university and they may not be linked at all. One of these groups may have their set of regular partners abroad, while another have theirs.

- It is fully possible that both of these groups have partners from a university abroad, but again; these partners may not be linked too, although they are both at the same institution.

Nevertheless, with the uncertainty that follows, this is our best option as no consortium ID is available in ECORDA and because looking for coordinators that have coordinated many projects is insufficient, as the coordinator role take turns between the consortia partners from one proposal to the next. We thus define a network of partners as a consortium where a set of three or more institutions have participated on two or more applications within a specific programme in either FP7 or Horizon 2020.

We ranked all institutions from the HES, REC and PRC sector by their success rates, and excluded all institutions that had been involved in fewer than four projects. For private companies the limit was set at three projects. Institutions whose high success rate was primarily based on Research Infrastructures and ERA-net participation was also excluded. We then selected 56 institutions from the six countries that were considered successful by these indicators.

The presentation of these results will be given in a compressed and anonymous format, as we are not allowed to publically present results based on the application data in ECORDA, where instiutions are being named.

2.5   Literature review

In the literature we analysed recent academic literature, as well as policy literature, studying the establishment of international research consortia - and consortia in EU FPs in particular - and the evidence that this literature provides on the factors behind a successful outcome of such consortia.

The search of relevant scientific literature was carried out by using a key word approach in the publication database Web of Science. We searched for academic literature on networks and determinants for R&D collaboration in European Framework programmes. The search primarily covered journals within the social sciences and papers analysing consortia and network characteristics in the FP6 and FP7. Since the Web of Science database does not cover all relevant publications, papers were also selected from previously identified literature and from screening the reference lists of publications found in the database search. In total, 21 scientific publications were identified and read, and 11 of these were considered relevant to our study.

2.6   Focus group and interviews

To complement and contrast the insights from the literature review we held a focus group interview with informants working at Norwegian institutions in May 2016 that were involved in EU funded projects. In September 2016 we conducted a number of telephone interviews with experienced coordinators of EU FP projects, and with key administrative personnel at universities and research funding organisations. In sum, twenty interviews have been conducted.

We interviewed coordinators in Norway and in the five benchmarking countries included in the study[3]. The coordinators, identified in ECORDA, were chosen based on whether they had been the coordinator of either several applications (of which at least one had received funding) and/or whether they had coordinated a large-scale project with many partners and a high amount of funding.

The interviewees were asked to elaborate on questions related to the importance of individual qualities of the consortium leader for managing a well-functioning consortium, how partners in the projects are identified and selected and the importance and role of effective administrative support for preparing excellent proposals and conducting funded projects. The interview guide was developed in collaboration with researchers from Sintef with long standing experience from both coordinating applications and projects in the FPs.

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[3] Organisations taking part in interviews: Sintef ICT, Norwegian University of Life Sciences, Norwegian Institute of Public Health, Institute of Transport Economics, University of Oslo, Oslo University Hospital, Norwegian Social Research NOVA (all Norway), Tekes - Finnish Funding Agency for Innovation, VTT – Technical Research Centre Finland (both Finland), FFG – Austrian Research Promotion Agency, Technikon Forschungs- und Planungsgesellschaft (both Austria), Vinnova, Umeå University (both Sweden), Technical University of Delft (Netherlands), University of Copenhagen – EU office, University of Copenhagen – Centre of Genetics (both Denmark).

3   Factors affecting EU participation

This chapter presents findings on our qualitative study of motivations, mechanisms and framework conditions that influence EU-participation, with a particular focus on the role of consortia and networks. It summarises previous discussions and observations regarding the role of the coordinator in establishing and managing successful consortia. The study is based on a review of relevant academic literature and policy reports and expert interviews we have conducted for this study on the same topics.

The literature analysed may be divided into two strands: the first, analysing social dimensions of forming a consortium, such as the importance of interpersonal dynamics between partners within a consortium, and a second strand, focusing on characteristics of R&D collaboration networks and characteristics of organisations. At the end of the chapter we discuss issues related to the Norwegian support measures for participation, and the researchers' perceptions of the benefits of taking part in EU framework programmes as highlighted by two previous evaluations.

3.1   Forming a consortium

There are different motivations for an organisation to take up R&D collaboration, nationally or internationally (i.e. engaging in an R&D consortium). It is well documented in the literature that factors such as the need to reduce technological or scientific uncertainty and to gain access to useful knowledge are important motivations. These motivations may also differ amongst the partners collaborating within the same network depending on the type of organisation (academic, industry, etc.). An empirical study analysing, in particular, networks in European Framework Programmes investigated the motivations of researchers collaborating in FP6-funded research projects (Nokkala et al., 2008). The study found that factors such as knowledge networking and exploration was the strongest motivation for organisations to engage in this type of R&D collaboration. The motivations included aspects related to particular goals of expanding the organisation's cooperation potential and to increase international networking and visibility. Other important motivations for participation were knowledge production, including expanding internal and personal competences, and knowledge diffusion and exploitation (including validation, policy advice, awareness, prototypes). In order to achieve the good results from international project collaboration, a key issue is to establish the right grounds for collaboration.

Key issues discussed in the literature are the importance of interpersonal relationships and prior collaboration experience for the success of collaborative research projects and as a determining factor behind the selection of partners to a consortium (Nokkala et al., 2008). Factors such as prior collaboration between partners, personal and organisational characteristics of the partners and the

formal status of the partners in past and current collaborative projects are identified as central elements for selecting partners.

The existence of prior contacts constitutes in many cases the backbone of the formation of the project consortia. In an empirical study it was found that in FP projects it was common that project partners had collaborated in previous projects with three to six of their current project partners and that the role of the coordinator was essential in this context as up to a third of the project partners had prior relations to the coordinator. In other words, prior collaboration between partners in a consortium constitutes an important "stock of capital for coordinators" but also for partners when taking a decision on taking part in a consortium (Nokkala et al., 2008). As stated by Okubo and Zitt (2004, p. 216): "The dynamics of interpersonal relationships are a critical element that will determine the success of any research project".

What these findings suggest is that personal contacts and known competencies play a fundamental role when selecting partners for a consortium. Good personal relationships, institutional ties, availability of funds, joint publications, easy communication and sharing of research paradigm are listed as important factors determining the selection of partners.

The literature also emphasises the importance of trust and reliability in selecting partners in international research projects (Nokkala et al., 2008; Okubo & Zitt, 2004). Some studies also find that the selection of partners is based on recommendation from other partners or trusted colleagues or on scientific reputation when the coordinator is less familiar with the research communities of other disciplines (Nokkala et al., 2008).

3.1.1   Main findings from interviews

The main findings on personal contacts and known competencies are supported with the findings from the interviews conducted in this project. EU FP projects build largely on existing international networks. All partners are seldom known from before, but new partners are often found through the network of the partners. Each consortium has an inner core of people who initiates and builds a consortium. This core typically consists of 2-4 people who have collaborated in previous EU- or nationally funded projects and thus established a close personal and professional relationship over several years. A few informants mentioned that they made contact with new partners at conferences or brokerage events. One researcher mentioned that previous research stays abroad had led to international contacts which she had then used for starting R&D collaboration. One informant stressed that he involved only people that he knew would deliver and that were interested in contributing to the proposed goals. In this regard it was important to foster good cohesions between the involved partners and the social skills of the coordinator was seen as helping to achieve this. A quote from an experienced coordinator illustrates this point:

> It is extremely important to foster community spirit; the more they [the partners] are familiar to each other the more they commit themselves to the goals.

In this regard, organising personal/social meetings during the project proposal phase and during the project is regarded as essential to create the right bonding between the partners. Some of our informants also mentioned that they always tried to meet with the partners physically. Financial support to cover the travel costs were found in their project funding, while travel support funds came from their own institutions. In some of the countries there were also national support schemes covering for the proposal preparation stage. These support schemes were perceived as very useful.

Good personal match between the partners was emphasised as important for the forming of the consortia as well as being a shaping factor for starting collaboration. A way to create integration between the partners was to make sure that each partner was involved in all work packages of the proposal. It was also pointed at a need for coordination to prevent disputes within the consortium, to have a clear division of work between partners. Especially, it was pointed at the need of delegating

tasks to an administrative project coordinator and not let e.g. the professors do the administrative coordination themselves. In general, the coordinators emphasised the need for separating functions for the administrative project coordination and the scientific coordination of projects. Bad coordination may lead to a loss in credibility and hamper future project collaborations.

Issues such as reputation and seniority of selected partners was not mentioned as particularly important when selecting additional partners to the consortium. On the contrary some experienced that it was an asset to have junior partners on board as they had shown to be more enthusiastic and engaged in the project work. This being said, the coordinators we have talked to have themselves excellent track records which is essential for getting the right people on board. Hence, a good balance between junior and senior staff was perceived as effective.

Several of our informants mentioned the new features of Horizon 2020 as posing challenges to their participation. In FP6 and FP7, researchers could to a larger extent rely on their existing networks and partners, but because of the strong emphasis on impact and involvement of users in Horizon 2020 this is no longer sufficient. This is especially evident for the second pillar of the programme and in Research and Innovation actions (RIA) where calls often require the active involvement of industry partners. Many academic researchers struggle with getting it right. The emphasis on impact is a challenge for the partners that have not thought through the issue of impact well enough. This was especially problematic for researchers which have no applied aims with their research. The technical and engineering universities and technical research institute, on the other hand, appear to have an advantage as the impact requirements are more in line with how they are used to work.

According to the key administrative personnel, the coordinator thus need to think more about the right composition of consortia in terms of type of actors involved. Positive outcomes were also reported when the consortium included "impact managers" and partners specialised in communication. What this reveals is that it is no longer sufficient to collaborate with the best researchers and institutions with high reputation; a successful consortium also needs to include industrial actors, end-users and professional communication managers.

In general, partners such as end-users, companies and NGOs are missing. An informant from a technical university claimed that:

> *We are a multidisciplinary team and many partners from industry and universities are involved. It is a normal research project. There are no challenges in coordinating and there is a lot of enthusiasm and willingness to cooperate. It is an easy job!*

The same informant acknowledged that the institution was well equipped in terms of providing administrative support to consortium leaders in proposal and management aspects and that the university leadership was backing international activities enthusiastically.

As is illustrated in the next section, the factors contributing to the formation of a consortium are to a large extent similar to those contributing to effective cooperation and a successful outcome of the actual projects.

3.2　Advantages and barriers to effective coordination

The literature indicates that a successful consortium is characterised by a *high level of cohesion* between project partners and tasks. Cohesion is achieved by trust, teamwork and good *personal relationships*. Cooperation is also facilitated if the partners have had previous positive experiences about international collaboration and a *supportive environment* at the home institution towards international collaboration (Nokkala et al., 2008). The literature also stresses that *intensive communication* (face to face) amongst the partners and the active involvement of senior scientists with high visibility and reputation (typically the coordinator or WP leaders) are central factors enabling a successful project implementation. It is well documented in the literature that *early face to face contact*

amongst project partners may actually be a prerequisite for successful remote collaboration (Stokols et al., 2008).

Concering barriers to collaboration, the Nokkala study (2008) did not identify *language* spoken by partners or their *geographical proximity* as significant. Other studies, however, based on econometric analysis (as opposed to interviews), reveal that geographical factors (distance and country boarders) are rather significant in terms of motivation for partner choice (Paier & Scherngell, 2011). According to Guellec & Van Pottelsberghe de la Potterie, 2001), two countries are more likely to collaborate if they are geographically close to each other, if they have the similar technological specialisation and if they share a common language. In an EU context, it has also been shown that EU immigration laws and travel visa requirements, lack of transparent, strong project management and coordination are barriers to the wider integration of non-European countries in the framework programmes (European Commission, 2015b).

A study of Paier & Scherngell (2011) focusses its attention on collaboration choice of organizations in FP5 research projects. Results from the study showed two important determinants for R&D collaboration between organisations: geographical and thematic distance effects. The first, indicate that geographical distance is a high barrier for close scientific collaboration. The second, that partner choice between organisations is determined by *closeness of thematic profiles.* From this, the authors conclude that the thematic instruments of the framework programmes target existing research communities particularly well. The study did not find any significant effects in terms of different levels of *FP experience* on partner choice. However, researchers who had previously taken formal roles (coordinators and work package leaders but also being a senior scientist) were seen by the consortium as potential partners for future collaboration compared to "ordinary partners" (Nokkala et al., 2008).

3.2.1   Main findings from interviews

Our informants seem to share the view that culture or language differences amongst the scientific partners did not represent significant barriers to scientific collaboration. An informant expressed that:

> *Cultural differences are good; new ideas are reached through different people.*

Though, the language may in some cases be a challenge. In some countries, researchers are not trained in English, such as in Eastern and Southern Europe. Several informants also expressed frustration with having to deal with unprofessional administrative departments of the partners' research institutions. Some informants complained that they had negative experiences from dealing with administrative or legal departments in some countries. Other countries, such as Germany, Belgium and Portugal were praised for having professional support structures. One informants claimed that:

> *The partners may be great but the system bad.*

The number of partners or the right balance of countries was not perceived as an important focus. On the other hand, collaboration with civil society organisations may create challenges. Due to their budgetary constraints, such partners cannot expect to be fully committed to the project. Collaboration with SMEs had also been seen as problematic at times because of their lack of experiences with EU FP projects. Some of the coordinators informed us that they often offered administrative support to "weaker" partners.

It was stressed that it is becoming less attractive to take up the coordinator role, as the new rules no longer compensates for extra financial resources for coordination tasks.

During interviews informants were asked to elaborate on the role of administrative support in developing proposals and in managing projects. In general, informants reported they had received some kind of support, but their experiences about the quantity and quality of such support varied substantially. Informants at large universities reported to have had excellent support from specialised

staff in preparing the administrative parts of the proposals. In Sweden, Finland and Denmark researchers may benefit from project establishment support, covering part of the expenses related to proposal writing. In Austria this type of financial support has been closed down (for the Horizon 2020) based on an evaluation which concluded that the scheme had no significant effect on the quality or quantity of proposals. This type of schemes has been regarded helpful but also to have limitations due to their limited coverage of expenses in the proposal process.

Research councils and support staff at universities appear to be well aware of the problems related to finding industrial partners for the consortia. Informants reported to have initiated activities for raising awareness for these issues (and for the need to include industrial partners to arrange specific activities directed at integrating academic and industrial partners), on how to get companies organised into the consortia. As already mentioned, the limited FP experience of companies was seen as a challenging aspect. It was expressed that only few companies are "ready" to apply to Horizon 2020. They have not thought through their impact well enough to make it easily integrated in the consortia. Some research funding organisations have pre-funding to build networks with companies. At one of the research funding organisations that we interviewed, there are plans to start a pilot activity on innovation for building networks with SMEs.

The issue of connecting communities which have not traditionally worked together was considered especially challenging. As an example, an informant mentioned the requirement in some calls to integrate partners from the ICT community with the creative industry. Here the NCPs at the research council found it fruitful to collaborate with the Enterprise Europe Network who had contacts with the creative industry part. The actors from the respective organisations' networks were shared and used in order to facilitate collaboration. In this regard, it was considered useful to arrange awareness activities in advance of the opening of calls in which "unusual" collaborations are required. The same research funding organisation offers different types of courses on general training about Horizon 2020 and the political background of the European Research Area (ERA); proposal development courses and proposal management; special training for small and medium enterprises (SMEs) and for writing proposals to the European Research Council (ERC). Strategic dialogue meetings (an informant called them "ERA dialogue meetings") are carried out with the universities. The meetings often involve the leadership (mostly deans) of universities with the objective to enhance organisational learning and awareness about European programmes. Similar talks are carried out with leading business people. In this regard it was considered useful to tailor support activates to the needs of different sectors.

Informants from technical research institutes reported that they benefit from professional support services at their local institutions. They receive help with most administrative aspects such as making consortium agreements, IPR, etc. An informant reported that:

> *This part needs expert work. How to calculate things. If you make any mistakes it may create tremendous problems for the project. Our department always checks what we have written and they go through every part of the budget.*

According to their experience they had seen that the same type of support was available from the home institutions of their partners. It seems that these institutions are less dependent on or in need of support from the national level, typically provided by NCP staff at National Research Councils.

Institutional strategies were mentioned as important. For instance, strategies for involving institutions and departments in EU research could help individual researchers who have an interest in applying for EU FP funding. One of our informants reported that they had formal processes for considering the calls; proposals are always checked with research managers who approves the process before the work on the project idea starts. It was claimed that large universities in Europe were working more strategically to position their interests in Brussels, while smaller universities appear to be struggling with the lack of efficient support at all levels; from lack of support for preparing proposals and to a lack of strategic leadership towards EU research. In the view of a researcher from a small university:

> *No, do not treat us as babies but we do need to have support as coordinators. Otherwise we will not be able to participate […]*

The lack of support at the level of institutions is seen as a negative element for the willingness to engage in EU research and may be bad for the coordination of the EU FP. One of our informants told us that the lack of support at the university had resulted in very labour-intensive work for which the informant knew there were good support systems at other universities. The informant expressed bitterly:

> *Due to my experiences I will never apply for EU FP again.*

From the perspective of the Norwegian informants, the support schemes from the RCN such as PES was widely used and perceived as helpful support. It was reported that the support team at the RCN was not so helpful with regard to finding industrial partners. While this was seen as depending on the sectors, Norwegian informants within the social sciences were more in need of help in finding partners from industry. The NCPs could do more to communicate between each other and exchange contacts across sectors. The support was perceived as too fragmented. More specific information about the strategic background of the calls were also requested. In some instances, the informants had experienced that partners in the consortium had been able to achieve useful information about the call from the NCPs in their countries. The issue of fragmented support was also raised in Finland, as expressed by an informant:

> *The experts are working for different organisations and on a general level. They are only working part-time on NCP issues. NCP issues need to be more prioritised. It [the support] is too fragmented as it is organised today.*

Several informants reported that they would have appreciated more interest and focused activities at the end of EU projects, to ask about experiences. An informant proposed that the RCN could do more to communicate results to the public about the results of EU funded research projects. Also in Sweden an informant asked for more attention of the NCPs at the end of projects.

3.3 The structure of R&D collaborative networks and determinants for participation

The rationale of the European framework programmes is built on the belief that R&D networks, defined as a set of organisations performing joint research and development is crucial for innovation. A number of studies have investigated the structural properties of the networks formed by FP collaborations over time (Barber & Scherngell, 2013; Breschi & Cusmano, 2004; Roediger-Schluga & Barber, 2008). These studies use different approaches to analyse R&D networks, such as regional sciences or geography of innovation perspectives and social network analysis.

Studies based on a social network approach show that integration between collaborating organisations has increased over time. Interesting to note in this context is that over time the network structure between European organisations appear to be quite stable. The literature in fact suggests that one of the key characteristics of the EU Framework programmes is the durability of partnerships (Nokkala et al., 2008; Okubo & Zitt, 2004; Paier & Scherngell, 2011). One study point at the existence of "oligarchic networks" which emerged in the early framework programmes and which has strengthened over time. An empirical analysis of FP4 and FP5 participation shows the existence of dense and hierarchical networks, formed by a well-connected core of frequent participants, taking leading roles in consortia and linked to a large number of peripheral actors (Breschi & Cusmano, 2004). This core comprises of actors from different sectors, including industry, outstanding public research agencies and academic institutions. The same study identified further two types of players: first, a minor group composed by actors participating frequently as partners in EU projects but showing rather low visibility; and a second group formed by a very large number of actors or partners with

seldom participation. From the researchers' point of view, it is of greatest interest to reach the core of the network (Breschi & Cusmano, 2004).

Similarly, a study by Roediger-Schluga and Barber (2008) found that there has been a stable core of actors in science and technology since the first FPs. The authors find that there is a significant overlap in participants for consecutive FPs and that the collaboration amongst the same organisations is recurring. Their study found that integration between collaborating organisations has increased over time and the core consisted primarily of universities and research organisations (e.g. CNR, CNRS, CSIC). Hence, despite the changing governance rules in consecutive FPs, the network formation mechanisms were presumed to have remained substantially unchanged (Roediger-Schluga & Barber, 2008).

In an empirical study, Barber & Scherngell (2013) reveal interesting results regarding the heterogeneity of European R&D collaboration networks. The results from their study demonstrate that European R&D networks are not homogenous. Instead, these networks include "substructures characterised by thematically homogeneous and spatially heterogeneous communities". Their study detected eight thematically homogenous communities (based on FP5 project data) and indicated the size of each community: the largest communities identified were Life Sciences, Electronics and Environment; followed by three transport related communities (Aerospace, Ground Transport and Sea Transport); the last two, Aquatic Resources and Information Processing were, according to the study, the smallest and most uniform thematically of the eight considered communities. The authors conclude that their results are interesting from a policy perspective view as they may serve as an important source of information for regional and national policy makers to direct their measures for stimulating specific collaboration.

In a Norwegian context, the region Agder and Rogaland was identified as having the highest number of participants in the community Aquatic Resources. The same region also had relatively high participations in the community Sea Transport and relatively low participation in the community Environment. Interesting to note is that Norwegian regions were absent from the other five communities (Barber & Scherngell, 2013).

According to a more recent study, this core-periphery structure was continued in the FP6 and FP7 collaborations, with a few countries at the centre with established strong ties between themselves and with the majority of countries falling at the periphery of networks. Hence, further integration between countries did, in general, not progress from FP6 to FP7 (European Commission (2015b). It is noteworthy however, that some countries increased their "popularity", in terms of being a more attractive collaboration partner in FP7 compared to FP6 (the calculations were based on CORDA data). Several of the Eastern European countries increased their attractiveness in FP7 (for example, Macedonia, Serbia, Croatia and Bosnia-Herzegovina), whereas other nations became less attractive (for example Chile, Australia, South Africa and Canada). Nordic countries were regarded as "moderate winners" in this context.

A study conducted by Lepori et al. (2015) shows that institutional reputation and size is an important determinant for the participation of higher education institutions in EU FPs. In particular, their study identified the following elements:

- A high concentration of EU-FP participation in a small group of highly reputed HEIs

- A very limited participation of non-doctorate awarding HEIs

- That the number of participations has a tendency to increase proportionally to the size of the organisations and

- Participation is strongly influenced by international reputation

What could not be identified in this study, was significant country effects in EU-FP participations, or on geographic distance from the organisations in Brussels.

3.3.1 Composition of collaborative FP projects

A network analysis based on FP7 data reveal interesting findings regarding the composition of collaborative projects, concluding that: "There does not appear to be a turning point related to the number of participants involved in a project where the benefits of adding more participants decrease" (European Commission, 2015b). However, FP7 participants express that when the number of partners gets too large this leads to complex and time consuming management.

Data from a NIFU survey to Norwegian FP6 participants also provide some information on the role of consortium size (Godø et al., 2009). A high number of partners in the consortium may provide challenges and in some cases be characterised as a negative factor for the project, but still be a strength when it comes to providing the skills and expertise for carrying out the project. Reanalysing data from the evaluation of the Norwegian participation in FP6, we find that the average number of the consortium partners for those finding the number of partners in the consortium to be a strength is 15 partners, whereas for those who replied that the number of partners was a weakness for the project, the average number of partners was 32 (Table 3.1, data from survey to Norwegian participants 2009). On the other hand, the average number of partners in projects where the partners' skills and expertise in carrying out the project was a strength, was considerably higher than for those where this was found to be a weakness (22 vs. 16 partners).

Table 3.1: Norwegian researchers' perceptions of their FP6 project consortia. Average number of partners in the consortia by strengths and weaknesses in the execution of the project.

Please evaluate the significance of the following as strengths or weaknesses in the execution phase of the project (positive or negative factor for the project):	Average number of partners in the project-consortium of those replying it was a:				
	Strength/ positive factor	No particular strength or weakness	Weakness/ negative factor	Don't know	Total average number of partners
The number of partners in the consortium	15	20	32	16	21
The distribution of resources among partners	19	20	29	16	21
The partners' skills/expertise in carrying out the project	22	22	16	17	21
The balance between the competence and the influence of the various partners in the consortium	19	22	23	21	21
The individual partners' respect of deadlines/delivery of results	19	21	23	20	21

Source: NIFU's survey to Norwegian FP6 participants 2009. N=530.

The European Commission's (2015b) report on FP networks further highlighted that project management difficulties may be incurred by increased multidisciplinarity and interdisciplinarity. While the report could not observe any ideal level of multidisciplinarity in terms of obtaining positive outcomes, it was stressed that a past history of collaboration may bridge diversity and build trust and strengthen personal relationships, and hence facilitate information flows within the consortium. The role of the coordinator is important in this context as it may facilitate communication between project partners from different work cultures and norms.

Similar conclusions were observed with regard to intersectoral collaboration. The FP7 review did not find any evidence suggesting that there is an ideal number of sectors (industry, public sectors, universities, etc.) in a project to achieve the outcomes sought in the framework programme (i.e. innovation and competitiveness, knowledge creation). It was observed however, that the type of intersectoral collaboration may matter more than the absolute number of sectors in a project. In this

context it is important to consider the specific programme, as well as thematic area and the specific calls, as these contain details and specificities which need to be taken into account when trying to identify "the proper balance in network team composition" (European Commission, 2015b).

On the other hand, the report revealed that projects with many different sectors in the consortium can bring specific management challenges. This stresses the lesson of project management which need to create a common purpose and at the same time aligning visions and interests amongst the different project partners.

3.4 Perceived benefits of FP6 versus RCN projects

In general, Norwegian researchers think that participation in the EU framework programme is very important for the internationalisation of Norwegian research (Langfeldt et al. 2012, p. 28). However, several issues may curb their motivation to participate.

Table 3.2: Norwegian research groups' perceived benefits from FP6 projects and RCN projects, by type of institution.

To what extent do you agree or disagree with the following statements concerning this particular project?	% 'Agree fully' or 'Agree partly'					
	RCN projects (survey 2012)			FP6 projects (survey 2009)		
	Total	Universities	Institutes	Total	Universities	Institutes
My/my group's overall <u>research capabilities</u> have been significantly improved as a result of the project	86	84	89	66	76	69
Long term <u>international cooperation</u> links have been considerably extended as a result of the project	61	71	55	78	84	79
The project led to significantly increased <u>publication output</u> in my unit	68	70	65	43	49	46
Through the project new research areas of significant importance for our future <u>research/innovation activities</u> have been explored	76	79	74	60	58	63
The project has led to/contributed to <u>innovation</u> (improved product, process or organisational method)	42	33	52	52	45	47

Sources:
- Langfeldt et al. 2012 (NIFU survey for evaluation of the RCN). N=326 (varies between questions, see source).
- Evaluation of Norwegian FP6 participation (Godø et al. 2009). N= 500 (varies between questions, see source).
- Total numbers include all sectors (HES, REC, PRC, PUB, OTH).

FP6 projects did not score as high as research projects funded by the Research Council of Norway (RCN) when it came to improving the research capabilities and publication output of the local research group/unit, nor when it came to exploring new research areas important to the local group/unit. These were the findings in a NIFU survey in 2012 to Norwegian researchers. On the other hand, the PF6 projects did score higher than RCN projects when it came to extending international cooperation (Table 3.2).

Whereas 90 per cent of the institutes answer that their research capabilities have been improved as a result of their RCN projects, the percentage is substantially lower when asked about similar impact of their FP6 projects (69 per cent). The difference is somewhat less pronounced by researchers at the universities: 84 per cent answer that their research capabilities have been improved as a result of their RCN projects and 76 per cent that it has been improved as a result of their FP6 projects. Notably, for all issues explored in Table 3.2, the answers from the researchers at the universities and at the institutes concur concerning whether the FP6 or RCN projects provide the most benefits, except when it comes to innovation. At the universities there is a larger proportion that answer that the FP6 projects contributed to innovation, than is the case for the RCN projects, whereas at the research institutes the result is the opposite: the RCN projects score slightly better than the FP6 projects on innovation. Hence, there seems to be few perceived comparative advantages of FP participation except for international network building (both for institutes and universities), and contribution to innovation (for universities only). In general, the researchers seem more satisfied with the outcome of the projects funded by their national research council (RCN), than by those funded by the FP.

3.5   Summary of observations

In sum, we see that there are several elements which are important for the formation of a successful consortium. These elements have implications as well for the type of support and advisory system that needs to be in place.

First, there needs to be a high level of trust between the core partners of the consortium. High levels of trust can only be achieved through previous collaborative experiences. From the view of the coordinator it is imperative to involve partners who are enthusiastic about achieving the project goals and capable to deliver. A consortium is often build by a few well trusted partners who have a history of collaboration. Additional partners are often found through the core groups' own networks and should meet the requirements of the call and complement the core scientific team. Hence, it is evident that experienced coordinators have little or no use of administrative support staff to identify key partners of the consortium.

Second, coordinators experience that other skills than those strictly academic are increasingly required in order to build a successful consortium. These skills include management and communication skills and experiences from communicating the impact of the planned research. Compared to previous Framework programmes, Horizon 2020 demands for increased attention on impact issues. The emphasis on impact is a challenge for the researchers that have not thought through the issue of impact well enough before the call. Technical and engineering universities and research institutes appear to have an advantage as their research are positioned at impact-thinking (all the time). The inclusion of a partner specifically dedicated to the management of tasks related to research impact was mentioned as a way to solve some of these issues. This underscores the importance of having not only access to an international network of researchers who can contribute to the academic quality of the proposal but that it is equally important to have access to networks of companies, end-user and civil society organisations.

Third, the activities of support and advisory systems need to address these requirements. National support systems and support staff at research institutions have better access to broader networks of different kinds of actors and initiate tailored "matchmaking" events or simply share potentially relevant

industrial partners or other relevant actors to the coordinator. However, the need for this type of support varies substantially between organisations and sectors. A general impression is that large institutions have better and more professionalised support systems than smaller institutions.

Fourth, the social skills of the coordinator play an important role in creating a well-functioning consortium. While the core partners often already know each other professionally and socially, a successful coordinator need to make sure that (new) partners are well integrated and committed to achieving the goals of the project. According to the interviewees' experiences, face to face meetings amongst the project partners was required in the project proposal process. The inner core of the consortium needs to meet to build and write the proposal. Each partner should also be involved in several work packages of the proposal.

Fifth, the existence of a professional administrative support during the proposal preparation stage is perceived as crucial for landing a successful proposal. A lack of a specialised support system and an unsupportive institutional environment (e.g. unengaged leadership and/or lack of a strategy for the institutions involvement in EU FPs) may result in weak participation and even contribute to the unwillingness of researchers to take up a coordinating role in the future. In this context, it was also reported that in order to avoid frictions between the coordinator and the rest of the consortium members, it was advised to separate the scientific coordination from administrative coordination of the consortium.

Finally, it seems that coordinators widely use and appreciate instruments targeting the project establishment phase. Nevertheless, it was reported that support activities should target the end phase of projects as well with the view to share experiences amongst coordinators. It was also suggested that support services should be made more specific to sectors and disciplines' needs. In a Norwegian context it was reported that national support and advisory system was too fragmented and mainly targeting technical disciplines disfavouring the social sciences. Hence, thematic NCPs should be more coordinated and be better at sharing information about their networks across thematic priorities.

4   Rejected versus funded proposals

In chapter 2 we presented a selection of consortia characteristics describing various aspects of the consortia partners' experience with, and success from EU FPs, and their attractiveness to other partners in EU FPs. Ten of the indicators are characteristics of the partners in a consortium. The last is a consortia characteristic itself – the number of partners in the consortia. In this chapter we investigate to what extent these indicators are associated with higher success in FP7 and Horizon 2020. Do the indicators really matter? The method is quite simple. We compare the average values in the funded projects and the rejected proposals. If the indicators do matter for the probability of getting EU funding, the values will be lower in the rejected proposals.

The data analyzed in this chapter, is based on 38 955 applications of which 7237 received funding from EU. This selection represents all applications and projects with contributions from the six countries that we study in this report.

Looking at FP7 (Table 4.1) and Horizon 2020 (Table 4.2) combined, we find that in the granted projects, the partners have better values on all indicators compared to the partners in the rejected projects. The numbers are presented as ratios, while raw numbers are found in the appendix (Table A.1). To recapitulate, the consortia indicators are:

- *Mean number of participants per application*

- *Centrality*: Number of unique partners in funded FP projects

- *Applications (N):* Number of applications from the same programme

- *Projects (N):* Number of funded projects from the same programme

- *Success rate*: Ratio projects-applications form the same programme

- *EU funding per application*: From the same programme

- *EU funding per project*: From the same programme

- *Publications (N):* Number of fractionalized publications in Web of Science (only for universities)

- *MNCS*: Field normalized citation index (only for universities)

- *ARWU:* Mean rank position in the Shanghai ranking (only for universities)

In tables 4.1 and 4.2 (and also the appendix), we do not show numbers for cells with less than ten applications. Hence, the total numbers may be larger than the sum of the applications/projects listed under each programme in the tables. In those programmes where the total is equal to one action type, we do not show a separate line for total numbers (which are identical).

Values above 1.0 indicates that the partners in granted projects have higher scores on the indicators. For the ARWU indicator, we have reversed the direction of the numbers, as the lower a university's value in ARWU is, the better is the university (lowest value is 1, which indicates that it is the world's most prestigious university). Hence, all values above 1.0 are positive for the ARWU indicator (as for the other indicators).

Reading instruction to Table 4.1 and Table 4.2

Using the *Energy* programme in FP7 as an example (Table 4.1), we see that the six countries in this study in total have participated in **902** applications that were rejected and in **284** applications that were granted EU funding.

In the applications that led to funding the average number of participants per application was 26 per cent higher than in applications that were rejected (ratio **1,26**). The Centrality value of the participants was 59 per cent higher in the EU funded applications compared to the rejected applications (ratio **1,59**). This means that the number of unique[4] collaborating partners that the partners in the successful applications have had in the Energy programme is higher, i.e. these partners have collaborated with many more different partners in EU funded projects.

The number of applications is 17 per cent higher for partners in funded applications compared to rejected applications (ratio **1,17**), i.e. on average partners in funded projects have had a 17 per cent higher number of applications to the Energy programme. Similarly, the number of projects the partners have participated in is 55 per cent higher among partners in funded projects compared to partners in rejected applications (ratio **1,55**). The overall success rate of the partners in the funded applications have been 286 per cent higher than for partners in rejected applications (ratio **3,86**).

When we take funding from EU into account, the partners in the funded projects have on average received 270 per cent more funding per application that they have participated in (ratio **3,70**), whereas the average EU funding per project that they have participated in is 99 per cent higher for partners in funded applications compared to partners in rejected applications (ratio **1,99**).

The last three indicators only apply to university partners. The university partners in applications that received funding were from larger universities compared to university partners in rejected applications. The former universities had on average 23 per cent more publications in Web of Science (ratio **1.23**), their publications were 11 per cent more cited (field normalized citation indicator – MNCS) (ratio **1,11**) and they were on average 17 per cent higher ranked in the Shanghai-ranking (ARWU) (ratio **1,17**).

This analysis serves two purposes: first, to identify consortia characteristics associated with higher degree of success among EU FP applicants, and second, to identify indicators that can be relevant when we in chapter 5 look at differences in success rates between Norway and five other countries.

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[4] If an institution has been involved in two projects; where one of the projects have one partner (University of Oslo) and the other project has two partners (University of Oslo and NTNU), then this institution has had two unique partners: University of Oslo and NTNU.

Table 4.1: Ratios between scores for partners in FP7 projects and rejected applications on ten indicators, across programmes and action types (red color = higher score in the rejected applications)

	Projects (N)	Rejected (N)	Mean number of participants per application	Centrality	Applications (N)	Projects (N)	Success rate	EU funding per application	EU funding per project	Publications (N)	MNCS	ARWU
Activities of International Cooperation												
Coordination & support action	61	106	1,46	3,96	2,59	3,99	4,78	4,65	3,25	1,04	1,03	1,01
Energy												
Total	284	902	1,26	1,59	1,17	1,55	3,86	3,70	1,99	1,23	1,11	1,17
Coordination & support action	39	64	1,16	1,43	0,98	1,38	3,83	2,66	1,49	1,29	1,13	1,21
Collaborative project	242	835	1,25	1,59	1,17	1,55	3,89	3,94	2,09	1,24	1,11	1,19
Environment (including Climate Change)												
Total	423	1490	1,23	1,55	1,24	1,58	3,15	2,54	1,59	1,26	1,11	1,18
Research for the benefit of specific groups	7	25	0,96	0,96	0,85	1,04	5,20	3,67	1,76	1,03	1,01	1,00
Coordination & support action	82	165	1,33	1,40	1,11	1,42	3,39	1,96	1,23	1,15	1,08	1,12
Collaborative project	333	1296	1,25	1,59	1,27	1,61	3,08	2,64	1,67	1,27	1,11	1,20
Food, Agriculture, and Biotechnology												
Total	458	1725	1,23	1,48	1,22	1,52	3,30	2,25	1,37	1,09	1,05	1,08
Coordination & support action	94	146	1,33	1,62	1,26	1,76	3,53	1,91	1,13	1,15	1,06	1,06
Collaborative project	361	1572	1,23	1,47	1,24	1,50	3,17	2,35	1,46	1,10	1,05	1,10
Health												
Total	790	2463	1,38	1,27	1,16	1,29	2,17	1,91	1,34	1,16	1,07	1,17
Network of Excellence	7	8	2,55	0,98	0,91	0,97	1,41	1,11	0,89	1,08	0,98	0,93
Coordination & support action	91	158	1,32	1,69	1,52	1,75	2,84	1,96	1,32	1,38	1,16	1,31
Collaborative project	692	2295	1,38	1,26	1,15	1,27	2,12	1,94	1,37	1,15	1,07	1,17
Information and Communication Technologies												
Total	1515	8093	1,23	1,19	1,07	1,18	2,54	2,05	1,28	1,13	1,06	1,11
Network of Excellence	37	65	1,42	1,17	1,10	1,17	1,45	1,22	1,03	1,24	1,09	1,19
Coordination & support action	203	362	1,08	1,26	1,14	1,29	2,81	1,96	1,20	1,17	1,10	1,14
Combination of CP & CSA	26	46	1,20	0,97	0,79	0,84	2,59	2,76	1,46	1,12	1,04	1,16
Collaborative project	1249	7620	1,22	1,19	1,07	1,18	2,52	2,08	1,30	1,13	1,06	1,10
Joint Technology Initiatives (Annex IV-SP1)												
Article 171 of the Treaty	273	649	1,16	1,69	1,19	1,72	3,27	2,39	1,16	0,91	0,99	0,95

Nanosciences, Nanotechnologies, Materials and new Production Technologies											
Total	568	1772	1,47	1,19	1,03	1,16	3,04	2,25	1,38	1,08	1,04	1,06
Coordination & support action	76	89	1,32	1,18	0,94	1,14	3,21	1,59	0,99	1,04	1,04	1,04
Collaborative project	492	1683	1,48	1,20	1,04	1,17	2,98	2,36	1,45	1,08	1,04	1,07
Regions of Knowledge											
Coordination & support action	49	144	1,12	4,33	1,02	3,88	9,16	8,19	3,46	1,46	1,13	1,16
Research Infrastructures											
Total	255	337	1,38	1,31	1,14	1,30	2,05	1,64	1,31	1,00	0,99	1,01
Coordination & support action	62	48	1,26	1,56	1,41	1,61	2,20	1,76	1,47	1,16	0,98	1,00
Combination of CP & CSA	184	269	1,47	1,30	1,12	1,27	2,03	1,64	1,30	0,99	0,99	1,01
Collaborative project	9	20	1,50	1,35	1,25	1,40	2,17	1,41	1,12	1,04	1,08	1,17
Research Potential											
Coordination & support action	4	40	1,10	6,67	0,64	2,08	18,44	3,38	1,30	1,24	0,95	1,03
Science in Society											
Total	138	419	0,99	1,80	1,00	1,79	4,37	3,39	1,74	1,13	1,06	1,08
Coordination & support action	103	345	1,04	1,89	0,98	1,81	4,65	3,54	1,79	1,14	1,07	1,08
Collaborative project	35	74	0,99	1,31	1,05	1,55	2,97	2,57	1,45	1,03	1,00	1,02
Security											
Total	240	934	1,17	1,73	1,29	1,70	3,50	2,96	1,67	1,04	1,03	1,04
Network of Excellence	4	23	1,02	1,52	1,33	1,67	2,25	2,13	1,59	1,61	1,11	1,16
Coordination & support action	37	114	1,39	1,91	1,44	1,94	3,24	1,78	1,14	0,74	0,91	0,89
Collaborative project	198	795	1,16	1,70	1,26	1,65	3,56	3,18	1,76	1,04	1,04	1,05
Socio-economic sciences and Humanities											
Total	212	1636	1,17	1,62	1,10	1,64	3,96	3,16	1,56	1,13	1,09	1,10
Research for the benefit of specific groups	2	12	1,30	1,01	0,57	0,76	12,23	3,66	1,24	1,10	1,25	1,36
Coordination & support action	28	84	1,29	1,66	0,82	1,86	6,74	4,50	1,52	1,01	1,05	1,05
Collaborative project	182	1539	1,15	1,67	1,17	1,66	3,44	2,91	1,60	1,14	1,09	1,10
Space											
Total	167	389	1,33	1,67	1,10	1,48	2,60	1,87	1,24	1,04	1,01	1,03
Coordination & support action	13	19	1,17	1,63	0,86	1,35	3,45	0,61	0,36	0,76	0,88	0,80
Collaborative project	152	370	1,28	1,64	1,13	1,49	2,54	2,03	1,36	1,05	1,02	1,05
Transport (including Aeronautics)											
Total	501	1338	1,28	1,32	1,01	1,28	2,69	2,46	1,55	1,05	1,05	1,07
Coordination & support action	115	231	1,24	1,21	0,98	1,22	2,55	1,96	1,26	1,11	1,05	1,08
Collaborative project	386	1105	1,31	1,36	1,03	1,30	2,72	2,58	1,62	1,04	1,05	1,07

The visual pattern of Table 4.1 is very clear. The indicators, with a few exceptions, are consistently associated with higher values among the participants in applications that have received funding from EU, compared to the partnes in the rejected applications. In those cases (i.e. higher scores in rejected applicantions), the common denominator is primarily that these are in action types where the total number of applications is very small, so that we cannot speak of statistically significant differences. These (non-significant) numbers will not be further commented.

In FP7, *the mean number of participants per application* was higher in all granted projects except in Collaborative projects under *Science in Society.*

In the two major action types (Collaborative projects and Coordination and support action) there are only small differences in the importance of this indicator. In the collaborative projects (keeping Research infrastructure aside), the largest difference in number of partners was in *Nanosciences, Nanotechnologies, Materials and new Production Technologies* where the number of partners per application was 58 per cent higher in the projects that were funded, compared to those who did not get funding. In the other major programmes, this additional number of partners was 38 per cent in *Health,* 31 per cent in *Transport (incl. Aeronautics)* and 28 per cent in *Space. In Information and Communication Technologies* it was 22 per cent.

The *centrality* indicator is – with one minor exception – completely in line with the theory: applicants with higher degree of centrality are at better chance for getting their projects funded. The biggest differences in centrality among partners in granted versus rejected applications are found in *Coordination & support* action types, where the centrality among those who got funding is 557 per cent higher in *Research Potential,* 333 per cent higher in *Regions of Knowledge,* 296 per cent higher in *Activities of International Cooperation,* 91 per cent higher in *Security*, and 89 per cent higher in *Science in Society.* In the collaborative projects, a simplified and somewhat artificial, overview of the findings, indicate that the more 'technical' the programmes are, the smaller are the differences in centrality. In *Security* (70 per cent) and *Socio-economic sciences and Humanities* (67 per cent), the centrality differences are much higher than in *Nanosciences, Nanotechnologies, Materials and new Production Technologies* (20 per cent) and in *Information and Communication Technologies* (18 per cent). The latter is arguably due to a much higher number of small private companies that are only engaged in one/or a few projects.

The results for the indicators which express past experience or success in some way (number of applications and projects, and the two funding indicators) are all consistently associated with higher values for participants in projects, compared to participants in rejected applications. The indicators do, to some extent, symbolize a 'Matthew effect', i.e. once you have received funding, the chances of doing it again are much higher than otherwise. This is clearly seen for the *success rate* indicator, which is one hundred per cent consistent in that the level of the partners' success rate from the programme are always higher in granted applications.

In the *Collaborative projects* the success rates are 256 per cent higher among partners in granted applications in the *Security* programme. Similar differences are 243 per cent in *Socio-economic sciences and Humanities*, 217 per cent in *Food, Agriculture, and Biotechnology*, 198 per cent in *Environment (including Climate Change)*,

197 per cent in *Nanosciences, Nanotechnologies, Materials and new Production Technologies and Science in Society,* 172 per cent in *Transport (including Aeronautics),* 153 per cent in *Space,* 152 per cent in *Information and Communication Technologies,* 117 per cent in *Research Infrastructures* and 112 per cent in *Health. In Coordination & support action,* the differences are even bigger, e.g. in *Socio-economic sciences and Humanities*, having 574 per cent higher success rates among partners in granted projects compared to partners in rejected applications. In sum, it is very clear, that differences in success rate is the key finding when looking at differences between partners in projects who received funding, compared to partners in applications who did not receive funding.

The three indicators representing university characteristics (size, citation impact and reputation) are consistently associated with higher success in the *Collaborative projects*. There are no exceptions to this. In *Coordination & support action,* the evidence is more ambiguous, but yet the values are largely in favour of partners with higher scores on these indicators. It is in particular applicants in *Environment (including Climate Change)* that have benefitted from high scores on these indicators: 27 per cent higher number of publications in funded projects, 11 per cent higher citation indicator and 19 per cent higher rank position in ARWU. The programmes where the university indicators seem to matter the least are found in *Transport (including Aeronautics), Security, Space* and *Science in Society.*

Shifting our focus to Horizon 2020 (Table 4.2), the results are largely the same. Both the *centrality* indicator and the *success rate* indicator are still working one hundred per cent in favour of partners in funded projects. Although the numbers vary somewhat between FP7 and Horizon 2020, there are no changes at the overall level. At this point, we would like to stress that the FP7 results involves a much larger number of projects and participants, compared to the early-phase results from Horizon 2020, so that the FP7 numbers are most reliable.

In Horizon 2020, when considering action types with more than 50 applications, the *number of participants per application* is only higher in the funded projects (or equal to the rejected applications) in *Coordination & support action* projects under *Food security, sustainable agriculture and forestry, marine and maritime and inland water research, Spreading excellence and widening participation* and *Industrial Leadership* (which does not include Space or ICT in this analysis). This is also the case for *Research and Innovation action* projects under *Science with and for Society.*

Centrality differences are lowest in *Research and innovation action* projects under *Future and Emerging Technologies, Industrial Leadership – ICT, Industrial Leadership* and *Secure, clean and efficient energy*. However, although the smallest difference is observed in FET-projects, the centrality indicator for funded project partners are still 26 per cent higher than for partners in rejected applications.

The consortia partners' *success rates* vary substantially in the three programmes *Europe in a changing world - inclusive, innovative and reflective Societies, Science with and for Society* and *Secure societies - Protecting freedom and security of Europe and its citizens.* The *Research infrastructures* programme aside – the partners' success rates are consistently at least 320 per cent higher in the granted projects, compared to in the rejected proposals.

The university indicators are still consistently associated with higher values in funded projects, except in *Research and Innovation action* projects under the *programmes Europe in a changing world - inclusive, innovative and reflective Societies, Secure societies - Protecting freedom and security of Europe and its citizens* and *Industrial Leadership – Space* (also for the action type *Innovation action* in this programme).

There is a notable difference in Horizon 2020 between Innovation action projects and Coordination & support action projects on the one hand, and Research and Innovation action projects on the other, with the former two displaying indicator values much more in line with the expected. This is striking in *Climate action, environment, resource efficiency and raw materials, Industrial Leadership – Space, Europe in a changing world - inclusive, innovative and reflective Societies* and in *Industrial Leadership.* In other programmes the findings are more ambiguous, but usually with smaller differences found in *Research and Innovation action* projects.

Table 4.2: Ratios between scores for partners in Horizon 2020 projects and rejected applications in ten indicators, across programmes and action types (red color = higher score in the rejected applications)

Climate action, environment, resource efficiency and raw materials	Projects (N)	Rejected (N)	Mean number of participants per application	Centrality	Applications (N)	Projects (N)	Success rate	EU funding per application	EU funding per project	Publications (N)	MNCS	ARWU
Total	74	245	1,37	2,28	1,15	2,23	5,23	4,19	2,27	1,06	1,08	1,06
Research and Innovation action	28	128	1,29	1,88	1,08	1,92	4,49	4,30	2,53	0,95	1,02	0,98
Innovation action	12	45	1,49	2,28	1,04	2,26	8,36	7,55	3,26	1,14	1,05	0,98
Coordination & support action	29	72	1,18	2,52	1,36	2,65	5,03	2,84	1,70	1,58	1,25	1,26
Europe in a changing world - inclusive, innovative and reflective Societies												
Total	68	889	1,20	3,16	1,03	2,96	11,12	7,71	2,44	1,16	1,06	1,08
Research and Innovation action	43	616	1,13	2,60	1,11	2,57	8,55	6,26	2,44	1,14	1,05	1,07
Innovation action	8	158	1,15	2,83	0,98	2,74	13,40	10,12	3,24	0,94	1,00	0,96
Coordination & support action	15	115	1,19	4,42	1,08	4,31	13,55	9,29	2,45	1,61	1,26	1,33
Food security, sustainable agriculture and forestry, marine and maritime and inland water research												
Total	66	283	1,29	2,09	1,08	1,98	7,03	5,61	2,52	1,15	1,06	1,09
Research and Innovation action	33	187	1,52	2,15	1,09	1,95	6,64	5,20	2,47	1,10	1,01	1,03
Innovation action	6	13	1,86	1,95	1,19	1,98	9,89	6,50	3,03	1,37	1,03	1,14
Coordination & support action	17	60	1,00	2,28	1,18	2,29	7,02	4,03	1,98	1,18	1,21	1,18
Bio-based Industries Research and Innovation action	6	11	1,35	0,96	0,55	1,18	8,03	3,79	1,68	1,09	1,19	1,18
Bio-based Industries Innovation action - Demonstration	2	10	0,48	3,92	3,16	4,36	8,60	37,48	11,35	1,14	1,17	1,64
Future and Emerging Technologies												
Total	51	919	1,13	1,26	1,08	1,88	6,93	6,63	2,16	1,16	1,05	1,11
Research and Innovation action	44	896	1,17	1,26	1,10	1,89	6,91	6,71	2,25	1,16	1,05	1,12
Coordination & support action	7	23	0,86	1,22	0,96	1,81	7,44	6,17	1,45	1,27	1,09	1,13
Health, demographic change and wellbeing												
Total	177	2015	1,44	1,56	1,08	1,54	5,78	4,46	1,65	1,22	1,08	1,24
Research and Innovation action	150	1959	1,40	1,61	1,19	1,56	4,96	4,29	1,76	1,23	1,09	1,26
Innovation action	5	38	1,33	1,80	0,82	1,48	9,98	4,32	1,53	0,84	0,94	0,91
Coordination & support action	10	14	1,14	1,43	0,92	1,51	5,10	3,38	1,19	1,21	1,13	1,27
Industrial Leadership												
Total	134	911	1,20	1,56	1,01	1,46	7,24	5,95	2,15	1,13	1,07	1,10
Research and Innovation action	64	527	1,26	1,42	0,92	1,34	6,41	5,72	2,15	1,07	1,05	1,04
Innovation action	49	340	1,19	1,55	1,00	1,43	7,97	6,63	2,31	1,09	1,05	1,09
Coordination & support action	20	44	0,87	2,62	1,94	2,64	7,13	4,34	2,07	2,50	1,46	1,84

Industrial Leadership - ICT												
Total	255	1660	1,08	1,48	1,11	1,41	4,98	3,70	1,70	1,15	1,07	1,13
Research and Innovation action	145	1262	1,02	1,37	1,09	1,38	4,23	3,51	1,72	1,17	1,08	1,15
Innovation action	62	294	1,01	1,95	1,51	2,01	6,57	5,06	2,39	1,13	1,07	1,11
ECSEL Research and Innovation Action	6	33	1,05	1,68	1,03	1,24	4,85	2,57	1,31	0,92	1,00	0,95
ECSEL Innovation Action	6	8	0,99	1,67	0,96	1,25	5,66	4,79	1,88	1,41	1,31	1,46
Coordination & support action	32	60	1,25	2,16	1,56	2,12	6,26	3,32	1,66	1,18	1,17	1,25
Industrial Leadership - Space												
Total	51	275	1,26	2,04	1,03	1,79	5,09	4,21	2,11	0,94	0,98	0,94
Research and Innovation action	28	199	1,09	1,72	1,13	1,84	4,66	4,51	2,32	0,96	0,97	0,94
Innovation action	17	60	1,08	2,10	1,15	2,60	6,40	5,68	2,52	0,97	1,05	1,00
Coordination & support action	6	16	2,22	8,92	1,91	4,02	5,65	3,42	1,97	1,18	1,11	1,17
Research infrastructures												
Total	78	184	1,33	1,73	1,26	1,74	2,91	2,29	1,58	1,09	1,04	1,09
Research and Innovation action	59	158	1,41	1,79	1,31	1,78	2,87	2,39	1,66	1,09	1,04	1,08
Coordination & support action	19	26	1,23	1,40	1,05	1,48	2,96	1,68	1,11	1,18	1,10	1,19
Science with and for Society												
Total	23	137	1,32	5,95	1,04	5,44	12,38	8,56	4,14	1,10	1,08	1,11
Research and Innovation action	7	55	0,81	3,20	1,03	5,44	12,45	10,62	5,01	1,06	1,04	1,03
Coordination & support action	16	82	1,48	6,35	1,07	5,37	12,07	7,97	3,97	1,12	1,11	1,14
Secure societies - Protecting freedom and security of Europe and its citizens												
Total	35	271	1,07	3,10	1,21	3,06	10,76	8,68	3,44	0,94	0,93	0,92
Research and Innovation action	17	160	1,10	3,42	1,35	3,22	10,37	9,20	3,88	0,76	0,83	0,84
Innovation action	11	70	1,11	2,89	1,18	2,97	10,72	8,49	3,09	0,98	0,96	0,92
Coordination & support action	7	41	1,01	2,33	0,81	2,64	11,88	6,54	2,39	1,36	1,15	1,15
Secure, clean and efficient energy												
Total	147	795	1,17	1,81	0,97	1,77	6,51	6,45	2,66	1,15	1,08	1,11
Research and Innovation action	56	385	1,20	1,52	0,98	1,58	5,24	4,81	2,18	1,08	1,05	1,11
Innovation action	37	191	1,05	2,49	1,18	2,08	7,98	10,83	4,43	1,39	1,13	1,20
Coordination & support action	47	219	1,19	1,65	0,90	1,67	6,05	3,23	1,51	1,05	1,11	1,02
Smart, green and integrated transport												
Total	95	317	1,52	1,92	1,04	1,68	5,25	5,53	2,57	1,09	1,06	1,10
Research and Innovation action	66	232	1,46	1,80	1,06	1,63	5,01	4,98	2,43	1,09	1,05	1,10
Innovation action	16	30	2,50	3,06	1,06	2,20	7,82	7,74	3,66	1,48	1,11	1,20
Coordination & support action	13	55	1,07	1,96	1,34	2,15	4,20	2,31	1,46	1,15	1,06	1,07
Spreading excellence and widening participation												
Coordination & support action	36	253	0,97	2,20	1,13	2,70	6,37	5,06	2,67	1,01	0,99	1,00

The shift from FP7 to Horizon 2020 may have led to differences in consortia formation, thereby also success citeria with regards to how important the consortia indicators (and their scores) used here actually are. The 'behaviour' of the institutions in Horizon 2020 that is captured here using data from a very early stage of the programme is most likely just as much 'post FP7' as it is Horizon 2020 behaviour. It is well known that many institutions struggled to adapt to the new rules of Horizon 2020. At the time of writing, much can have changed in how actors in Horizon 2020 form their consortia.

5 Main results

In the former chapter, we demonstrated that there is a clear correlation between high scores on the consortia indicators that we outlined in chapter 2.4 and successfully getting funding from EU. Applications that were funded by EU had almost consistently higher scores on the indicators compared to the applications that were rejected. But even though high indicator scores are associated with greater probability of getting projects funded, and must therefore be seen as important characteristics of a consortium, this does not necessarily mean that these indicators can explain differences in success rates between countries. That would require that the differences in scores on these indicators vary so much between countries that they systematically lead to different prospects for getting applications funded.

In this chapter, split in FP7 programmes (chapter 5.1) and Horizon 2020 programmes (chapter 5.2), we compare Norway's success rates and indicator values with those of Austria, Denmark, Finland, Netherlands and Sweden. In the tables, the countries are ranked by their success rates. If another country has a better score than Norway on an indicator, it is marked in red, while green numbers indicate that Norway has higher scores. On the indicator measuring average rank position of university partners in the Shanghai ranking (ARWU), low values indicate positive scores (the closer a university is to 1st place in the ranking, the better).

Indicator scores are presented separate for coordinators and partners of the consortia. They represent mean values from the same programme, i.e. a university or private company's number of applications or centrality degree in other programmes are not taken into account when the numbers in the forthcoming tables are presented, cf. discussion in chapter 2.4. For simplicity reasons, we only show the Norwegian values for *Funding per project by nation*, which is the sum of EU funding (in euros) in the program received by the partners from each country, divided by the total number of funded projects that they have had (raw numbers for all countries are found in the appendix, Table A.77).

Having been included in chapter 4, to test whether indicator scores vary between funded and rejected applications, some of the programmes have been excluded for the analyses presented in chapter 5. The reason for this, is that the number of applications are too small for meaningful analyses across countries to be carried out. With less than 25 applications and very low variation in scores, *Regions of knowledge* and *Spreading excellence and widening participation* were excluded.

In the forthcoming tables, the numbers are presented at programme level. In the appendix we show the same results split by action types, with a lower limit of 20 applications in order for the numbers to be shown. This means that numbers for some sectors, and for some action types, are missing in our report. The totals presented in chapters 5.1 and 5.2 include all sectors and action types, but specific numbers by action types are only shown in the appendix for three sectors (HES, PRC and REC).

Reading instruction to tables in Chapter 5

Many of the numbers presented in the upcoming tables are not necessarily intuitive easy to understand. We therefore provide the readers of this report a 'reading instruction' to the tables, using the Norwegian values (which are always in **bold types**) as our starting point.

For each programme, the countries are listed according to their success rates. In the table below, Norway's success rate in the programme is **28,0** per cent, i.e. **95** out of **339** applications where Norway has participated were granted funding by the EU (and **244** were rejected). Among the 95 funded projects, the mean funding given to Norway per project was **528 643** euro. This is the lowest average funding per project among the countries in our study, the Norwegian funding was only 90 per cent as that of Finland (i.e. 10 per cent lower), 70 per cent as that of Sweden (i.e. 30 per cent lower), 84 per cent as that of Austria (i.e. 16 per cent lower), 56 per cent as that of Netherlands (i.e. 44 per cent lower) and 70 per cent as that of Denmark (i.e. 30 per cent lower). In the 339 Norwegian applications the mean number of participating institutions was **12,6**. This was marginally lower than in Austrian applications (12,9), but higher than in all other countries, e.g. almost two participants more on average compared to Denmark, where the average number of participants was 10,8.

The values presented so far, apply for the whole consortia. We now separate the numbers between the coordinators of the applications, and the other partners of the applications. In the results for *Coordinators* we show the mean values for coordinators of all applications where Norway, Finland, Sweden, Austria, Netherlands and Denmark have participated, respectively. Then, we show mean values for all other *partners* in the projects where the same countries have participated.

Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

	Finland	Sweden	Austria	**Norway**	Netherlands	Denmark
Success rate (mean)	28,9	28,5	28,2	**28,0**	27,4	26,4
Projects (N)	159	328	187	**95**	508	202
Rejected (N)	392	821	477	**244**	1346	562
Applications (N)	551	1149	664	**339**	1854	764
Funding per project by nation (*)	0,90	0,70	0,84	**528,643**	0,56	0,70
Participants per application (mean)	12,0	10,4	12,9	**12,6**	10,4	10,8
Coordinators						
Centrality (mean)	0,23	0,28	0,21	**0,23**	0,24	0,22
Number of applications (mean)	101,6	134,9	91,5	**100,6**	104,4	95,1
Number of projects (mean)	31,4	40,9	26,8	**30,8**	32,2	28,8
Success rate (mean)	0,27	0,27	0,26	**0,28**	0,28	0,27
EU funding per application (mean)	147,802	155,814	141,972	**169,073**	159,899	152,491
EU funding per project (mean)	466,055	466,619	423,442	**471,227**	467,217	464,768
Publications (mean)	4,179	4,478	3,465	**4,434**	4,326	4,395
MNCS (mean)	1,03	1,04	0,99	**1,06**	1,06	1,03
ARWU (mean)	292,2	253,1	346,7	**263,5**	280,1	271,0
Partners						
Centrality (mean)	0,16	0,18	0,15	**0,15**	0,17	0,16
Number of applications (mean)	64,2	75,4	62,9	**62,3**	69,7	65,0
Number of projects (mean)	19,9	23,4	19,1	**19,0**	21,9	20,2
Success rate (mean)	0,29	0,30	0,29	**0,29**	0,30	0,29
EU funding per application (mean)	113,874	125,017	111,474	**111,730**	123,957	122,600
EU funding per project (mean)	335,642	357,790	326,232	**329,273**	352,921	349,758
Publications (mean)	3,687	4,017	3,534	**3,707**	3,985	3,950
MNCS (mean)	0,96	0,98	0,95	**0,96**	0,99	0,99
ARWU (mean)	348,7	316,6	363,1	**344,2**	326,4	322,7

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

Coordinators in applications where Norwegian institutions have participated has a mean *Centrality* score of **0,23.** This means that the number of unique collaborating partners that the coordinators in the Norwegian projects have had in other projects in the same programme, is 23 per cent of that of the institution with the highest number of unique collaborating partners in the programme. The Norwegian centrality score is identical to Finland's, and higher than in Austria (0,21) and Denmark (0,22), but lower than in Sweden and Netherlands.

The *mean number of applications* for coordinators in Norway's projects in this programme was **100,6** which is a very high number, and is e.g. higher than for coordinators of Austrian projects (91,5), but lower than for coordinators of Swedish projects (134,9). Note that the mean number of applications for the *partners* is substantially lower. This is because the coordinators are usually from large universities or research institutes. For the particular programme we study here, there are some 50 institutions (universities, university hospitals and research institutes) with more than 100 applications submitted to this programme. The highest number is 575 applications.

The *mean number of projects* in the current programme that coordinators in Norwegian projects have participated in is **30,8**. This is higher than for Austria (26,8) and Denmark (28,8), but lower than in the other three countries. Again, we note that the coordinators (30,8 project participations) come from larger and more experienced institutions than the other project participants in Norwegian projects (19 project participations on average).

The success rate gives the ratio between submitted applications and granted projects. The mean success rate of coordinators in Norwegian projects was **0,28** (i.e. 28 per cent). This is equal to coordinators of Dutch (0,28) applications, and (marginally) higher than in all other countries (0,26 – 0,27).

Looking at *EU funding per application*, on average, coordinators of Norwegian applications (and projects) have received **169 073** euros per application that they have submitted. Mean *EU funding per project* has been **471 227** euro for the coordinators. These numbers are higher than for all other countries' coordinators (the numbers for the Norwegian partners, however, are only higher than in Austria).

The last three indicators that we consider are university characteristics, and thus only calculated for the university coordinators and university partners. The university coordinators of Norwegian projects are on average from universities with a mean of **4434** (fractionalized) *publications* over a four-year period in Web of Science. This is marginally lower than for university coordinators in Swedish projects (4478 publications), but markedly higher than in Austria where the coordinators' universities have an average of 3465 publications, i.e. almost 25 per cent lower than for Norway.

The university coordinators of Norwegian applications are from universities with a mean field normalized citation index (*MNCS)* of **1,06.** This number means that their publications on average are cited 6 per cent more than the world average. Together with Netherlands (also 1,06) this is the highest citation index among the six countries.

The final university indicator is mean position in the Shanghai ranking (*ARWU)* where university coordinators in Norwegian applications on average are ranked **263,5**th. This is the second best rank in the table. Only Sweden (253,1) has a higher rank for the coordinators. Again, we notice that the coordinators have better scores than the partners. While university coordinators in Norwegian applications on average are ranked 263rd in ARWU, the university partners are on average ranked 344th.

5.1 FP7 programmes

5.1.1 Activities of International Cooperation

Among Norway's 23 applications under *Activities of international Cooperation* (Coordination & support action)*,* 14 were from the Research Council of Norway (RCN). Five were from research institutes, three from universities and one from a private company. Twelve of the fourteen funded projects were from the RCN, whereas one research institute got the last two projects. This exceptional standing of RCN is very different from other countries, such as Netherlands where 16 projects were in research institutes, 12 in public sector institutions, nine in higher education institutions, and one in a private company.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.1.1 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Activities of International Cooperation	Norway	Finland	Austria	Sweden	Netherlands	Denmark
Success rate (mean)	**60,9**	50,0	43,9	34,5	30,6	23,8
Projects (N)	**14**	18	36	10	15	5
Rejected (N)	**9**	18	46	19	34	16
Applications (N)	**23**	36	82	29	49	21
Funding per project by nation (*)	**118,572**	0,78	0,45	0,97	0,75	0,82
Participants per application (mean)	**14,3**	12,4	12,1	9,3	11,2	8,3
Coordinators						
Centrality (mean)	**0,30**	0,26	0,31	0,10	0,20	0,02
Number of applications (mean)	**18,2**	18,3	21,2	7,1	15,3	2,6
Number of projects (mean)	**14,0**	13,3	14,9	3,9	10,1	0,9
Success rate (mean)	**0,57**	0,48	0,45	0,34	0,36	0,26
EU funding per application (mean)	**199,977**	144,826	106,387	82,567	10,481	67,230
EU funding per project (mean)	**239,541**	184,038	141,568	118,627	144,823	96,379
Publications (mean)	**100**	1,829	1,484	1,998	2,438	1,401
MNCS (mean)	**0,40**	0,62	0,64	0,72	0,81	0,70
ARWU (mean)	**800,0**	617,1	625,8	530,4	515,3	582,2
Partners						
Centrality (mean)	**0,20**	0,16	0,17	0,13	0,11	0,05
Number of applications (mean)	**10,4**	8,6	9,3	7,5	6,6	3,8
Number of projects (mean)	**7,7**	6,0	6,3	5,0	4,0	1,8
Success rate (mean)	**0,66**	0,55	0,53	0,46	0,38	0,27
EU funding per application (mean)	**85,301**	71,928	60,711	56,180	49,214	38,723
EU funding per project (mean)	**113,307**	96,032	83,657	82,950	73,131	58,364
Publications (mean)	**2,359**	2,700	1,563	2,088	2,414	2,371
MNCS (mean)	**0,79**	0,80	0,65	0,75	0,75	0,78
ARWU (mean)	**509,7**	496,1	613,6	515,5	532,2	510,2

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

Norway and Denmark (representing the highest and the lowest success rate) have almost the same amount of applications, but Norway has a much higher mean score for their partners' centrality, and a much higher mean number of partners per application. Norway scores better on the other indicators too, except those referring to university characteristics. Here, Norwegian coordinators have the lowest

scores (coming from small universities in Finland and Ukraine), but this is not so among the partners. In general, Norway's high success rate is best explained by solid partners from outside the HES sector. The Norwegian participation has mostly been driven by public sector organizations, whereas in the other countries the participation comes from mixed sectors. The paradox, is that while Norway performs well in terms of success rate, the funding to Norwegian institutions per project is lower than in all of the five other countries, and in general less than half of what Austria receives and 18-25 per cent below the other countries.

Main points:

- Norway has an exceptional high success rate in the programme, but the project participants receive less funding than other countries' participants.

- Coordinators and partners in applications where Norway participates are more experienced than in the other countries. They are also more oriented towards the public sector whereas higher education institutions and research companies are more involved in other countries' applications.

5.1.2   Energy

Norway's high success rate in *Energy* is clearly associated with coordinators with high centrality with much experience from participation in both applications and projects, but nevertheless with somewhat lower funding than the partners from the other countries. Coordinators in Danish projects are less central, but have generated more funding relative to their efforts in applications and projects compared to coordinators in Norway's projects. The scores indicate that Norwegian institutions generally have participated in projects where the *coordinators* represent big, reputed universities, whereas it is the opposite when we look at the *partners* in Norwegian projects. These perform better than other countries' partners when we look at the funding indicators, but are not from universities of the same standing as the coordinators.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Breaking the numbers down on sector level, Norway's PRC sector stands out with a success rate of 37 per cent in the *Collaborative projects* of the *Energy* programme (Table A.14), and that coordinators and partners in projects where Norwegian PRC's are included, consistently score better than the five comparing countries on almost all indicators. The REC sector of Norway also has a success rate above our national average (Table A.15), in the mid-group with Netherlands and Finland, clearly above Austria and clearly below Denmark. The Danish applications are by comparison submitted with more successful coordinators, from larger and more reputed universities, and with a higher total number of participants. This is much the same for the Danish partners. The Norwegian HES sector has a success rate below those of Norway's REC and PRC sectors (Table A.13). The most consistent finding separating Norway from Denmark, whose HES sector has the highest success rate, is the Danish HES sector's consistent higher indicator scores among its partners.

Table 5.1.2 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Energy	Denmark	Norway	Netherlands	Finland	Sweden	Austria
Success rate (mean)	31,8	**30,5**	28,7	27,1	25,2	22,5
Projects (N)	91	**74**	167	51	81	71
Rejected (N)	195	**169**	415	137	240	244
Applications (N)	286	**243**	582	188	321	315
Funding per project by nation (*)	0,83	**808,106**	1,17	0,95	1,30	1,05
Participants per application (mean)	11,9	**12,5**	11,2	12,0	11,2	11,5
Coordinators						
Centrality (mean)	0,18	**0,24**	0,20	0,15	0,12	0,17
Number of applications (mean)	25,4	**36,0**	30,7	21,4	19,6	29,8
Number of projects (mean)	8,5	**11,6**	9,5	6,6	5,3	8,0
Success rate (mean)	0,28	**0,29**	0,27	0,27	0,26	0,23
EU funding per application (mean)	225,406	**164,805**	178,303	185,033	189,422	201,187
EU funding per project (mean)	461,700	**404,886**	412,200	385,133	415,864	403,613
Publications (mean)	3,190	**4,018**	3,198	2,438	3,154	1,930
MNCS (mean)	1,01	**0,99**	0,97	0,83	0,91	0,80
ARWU (mean)	368,8	**311,0**	368,7	455,8	365,6	525,7
Partners						
Centrality (mean)	0,15	**0,16**	0,14	0,13	0,11	0,11
Number of applications (mean)	20,5	**20,8**	19,5	18,7	15,8	16,4
Number of projects (mean)	6,7	**6,8**	6,0	5,6	4,7	4,7
Success rate (mean)	0,32	**0,33**	0,31	0,30	0,30	0,26
EU funding per application (mean)	117,390	**118,528**	105,342	112,592	108,379	93,560
EU funding per project (mean)	259,451	**278,357**	248,146	256,323	245,475	217,427
Publications (mean)	3,088	**2,991**	3,109	2,593	3,057	2,396
MNCS (mean)	0,96	**0,92**	0,93	0,86	0,91	0,85
ARWU (mean)	400,3	**412,9**	410,4	473,2	399,3	483,3

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

Main points:

- Norway has the second highest success rate and the third highest level of funding per project among the six countries.

- Main strengths of participants in Norwegian applications compared to other countries, include both coordinators and partners with much experience from applications and projects in the programme, while the coordinators are from larger and more reputed universities compared to other countries.

5.1.3 Environment (including Climate Change)

Norway's success rate in the FP7 programme *Environment (including Climate Change)* was the highest among the six countries studied here (Table 5.1.13), and consistent with the highest funding levels per project – except for the Dutch projects. The coordinators in the Norwegian applications do not come from as big and reputed universities as those in the othe countries' applications. In addition, the centrality score and the success rates of the coordinators are only marginally higher. The funding indicators, however indicate that the Norwegian applications have been coordinated by institutions that have achieved much higher levels of funding in the *Environment* programme compared to other countries' applications. These findings also apply for the partners in the Norwegian applications, but here – the university partners score better in general than the university partners in the other countries' applications.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.1.3 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Environment (including Climate Change)	Norway	Denmark	Netherlands	Austria	Finland	Sweden
Success rate (mean)	30,5	28,7	26,4	25,2	23,2	22,9
Projects (N)	138	132	284	145	85	122
Rejected (N)	315	328	790	431	282	411
Applications (N)	453	460	1074	576	367	533
Funding per project by nation (*)	552,205	1,28	0,87	1,58	1,50	1,15
Participants per application (mean)	15,3	15,5	13,9	14,9	14,8	14,0
Coordinators						
Centrality (mean)	0,21	0,22	0,20	0,18	0,19	0,19
Number of applications (mean)	46,2	50,1	45,4	44,3	42,9	44,2
Number of projects (mean)	13,8	14,4	13,3	12,0	11,9	11,8
Success rate (mean)	0,30	0,27	0,27	0,24	0,25	0,24
EU funding per application (mean)	111,550	97,778	95,861	82,496	88,402	81,614
EU funding per project (mean)	317,659	299,136	292,557	262,263	287,261	275,950
Publications (mean)	2,868	3,679	3,417	2,945	3,365	3,084
MNCS (mean)	0,92	1,01	0,99	0,93	0,95	0,95
ARWU (mean)	404,0	337,9	365,8	420,8	364,9	374,4
Partners						
Centrality (mean)	0,16	0,15	0,14	0,12	0,15	0,13
Number of applications (mean)	33,5	32,9	30,5	27,3	31,9	30,1
Number of projects (mean)	9,9	9,5	8,8	7,5	9,2	8,4
Success rate (mean)	0,29	0,27	0,27	0,24	0,25	0,25
EU funding per application (mean)	72,103	67,128	64,446	54,174	60,628	58,207
EU funding per project (mean)	204,002	194,600	183,290	162,434	185,090	176,399
Publications (mean)	2,937	3,000	2,884	2,505	3,009	2,817
MNCS (mean)	0,89	0,90	0,88	0,84	0,89	0,87
ARWU (mean)	415,2	412,0	431,5	468,4	417,4	425,5

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

Only REC institutions have a large enough volume of applications from *Coordination & Support action* for us to show numbers (Table A.18). Based on a limited number of applications from Norway, 31, the Norwegian success rate is 35 per cent, with all indicator scores clearly below the Austrian scores,

being the highest in our sample. The Norwegian REC sector's success rate in *Collaborative projects* is the highest in our sample, 34 per cent (Table A.19). The indicator scores for coordinators of Norwegian applications show mixed results compared to the other countries, while the partners in the Norwegian applications by large have higher indicator scores. This pattern is almost identical for the PRC sector in Norway (Table A.17). Norway's HES sector is behind both Denmark and Netherlands in terms of success rates and indicator values, while being ahead of Finland, Austria and Sweden in success rates and indicator scores (for both coordinators and partners).

Main points:

- Norway has the highest success rate and the second highest level of funding per project in the sample of countries, which is much higher than in Denmark, Austria and Finland.

- Coordinators and partners in Norwegian projects have been successful in their efforts in the programme, i.e. higher activity of applications and projects compared to other countries, having the highest success rates and the best funding results.

5.1.4 Food, Agriculture, and Biotechnology

In *Food, Agriculture and Biotechnology*, Norway's success rate (24,7 per cent) is within reach of all other countries by +/- 2,3 per cent. However, the Norwegian funding in the projects is only higher than in Austria, and 10-20 per cent lower than in Finland, Sweden and Denmark, and 36 per cent lower than in the Netherlands. The relative small difference between the countries in success rates is also reflected in the lack of consistency in the indicator scores. Compared to Netherlands, whose success rate is the highest, Norwegian coordinators and partners have equally high success rates. In general, the differences in the indicator scores seem to better explain differences in national funding levels per project than to explain success rate differences.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

At sector level, it is in particular the Norwegian PRC sector that performs well under the *Collaborative projects* of the *Food, Agriculture and Biotechnology* programme (Table A.4). Norway's success rate is here 23,1 per cent, which is slightly more than Netherlands', and well above those of Sweden and Finland. Interestingly, the indicator scores for Norway's coordinators and in most cases also the partners are consistently lower than those of Netherlands and Denmark (except for number of partners per application) even though Norway's success rate at the sector level is higher. However, the difference in success rates are modest.

We find the same patterns in the HES sector's *Collaborative projects* (Table A.3), where Norway's success rate is slightly lower than those of Netherlands and Denmark, about the same as Sweden's, and higher than in Finland and Austria. In this sector, coordinators and partners in the Norwegian projects score consistently lower than in the Dutch, Danish and Swedish applications, but generally better than in the Finnish and Austrian projects. In particular, participants in Norwegian applications have higher scores on the university related indicators compared to the latter two countries.

Table 5.1.4 Consortia characteristics for coordinators and partners in applications from six countries (Green value** = higher score for Norway, **red value** = lower score for Norway)**

Food, Agriculture, and Biotechnology	Netherlands	**Norway**	Denmark	Sweden	Finland	Austria
Success rate (mean)	27,0	**24,7**	24,6	23,0	22,6	22,6
Projects (N)	335	**115**	177	126	113	120
Rejected (N)	908	**350**	542	422	386	411
Applications (N)	1243	**465**	719	548	499	531
Funding per project by nation (*)	0,64	**380,402**	0,80	0,84	0,90	1,11
Participants per application (mean)	14,1	**15,0**	14,9	14,6	14,9	15,0
Coordinators						
Centrality (mean)	0,22	**0,17**	0,23	0,18	0,19	0,17
Number of applications (mean)	94,7	**73,3**	95,2	77,4	79,4	72,0
Number of projects (mean)	28,6	**20,4**	27,2	21,7	22,1	20,2
Success rate (mean)	0,24	**0,24**	0,24	0,23	0,23	0,22
EU funding per application (mean)	85,578	**80,589**	83,250	81,695	79,520	77,546
EU funding per project (mean)	304,350	**287,786**	301,233	308,739	297,566	293,200
Publications (mean)	3,356	**3,159**	3,751	3,321	3,138	2,818
MNCS (mean)	0,95	**0,92**	0,98	0,96	0,92	0,90
ARWU (mean)	364,5	**381,2**	331,8	355,2	396,2	414,4
Partners						
Centrality (mean)	0,11	**0,09**	0,11	0,10	0,10	0,09
Number of applications (mean)	44,2	**37,3**	43,7	39,6	40,8	36,2
Number of projects (mean)	12,6	**10,3**	12,0	10,8	11,0	9,7
Success rate (mean)	0,27	**0,28**	0,27	0,25	0,26	0,25
EU funding per application (mean)	59,853	**57,833**	58,564	57,443	55,009	52,912
EU funding per project (mean)	192,779	**181,569**	188,899	190,407	186,326	173,114
Publications (mean)	3,015	**2,651**	3,132	3,089	2,987	2,564
MNCS (mean)	0,89	**0,84**	0,90	0,90	0,88	0,84
ARWU (mean)	415,3	**455,6**	405,0	394,7	420,5	468,0

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

The *Collaborative projects* with participation from the Norwegian REC sector, have roughly the same success rate as those of Denmark, Finland and Austria, but much higher success rate than the Swedish sector – and markedly lower than in the Netherlands (Table A.6). Dutch coordinators and partners score better on all indicators compared to those of Norway. On the opposite side; Norway's scores are better than those in Austria and Sweden. The success rates between Denmark, Norway and Finland differ little, and the indicator scores are inconsistent with the success rates.

Only, the REC sector have an application volume high enough for its results to be shown separately in *Coordination & support action.* Here, Norway has a success rate around Austria's level, but success rates in both Netherlands and Finland are about twice as high as in Norway. Norwegian applications have slightly more participants than the Dutch applications, but the coordinators and partners in Netherlands and Finland have higher scores an all indicators compared to the Norwegian applications.

Main points:

- Norway's success rate in the programme is rather similar to the other countries, but the funding per project is much lower for Norwegian project participants.

- The coordinators and partners in Dutch, Danish, Finnish and Swedish applications have performed much better in the programme than the coordinators and partners in Norway and Austria who are the two countries with the lowest levels of funding per project.

5.1.5 Health

Success rates of the six countries do not vary much in the *Health* programme. Hence, the inconclusiveness of the indicator scores is not surprising. The simplified interpretation of Table 5.1.5, based on a visual impression only, is that the coordinators in the projects with Norwegian participation score relatively better compared to the coordinators in the other countries' applications, whereas it is the opposite for the other partners in the consortia. For example, Finland, having the highest success rate, have in general lower scores for the coordinators compared to Norway. Norwegian projects have in general much lower funding than the other countries' projects. At its most the difference is almost half the funding per project compared to the Netherlands.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.1.5 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Health	Finland	Sweden	Austria	Norway	Netherlands	Denmark
Success rate (mean)	28,9	28,5	28,2	**28,0**	27,4	26,4
Projects (N)	159	328	187	**95**	508	202
Rejected (N)	392	821	477	**244**	1346	562
Applications (N)	551	1149	664	**339**	1854	764
Funding per project by nation (*)	0,90	0,70	0,84	**528,643**	0,56	0,70
Participants per application (mean)	12,0	10,4	12,9	**12,6**	10,4	10,8
Coordinators						
Centrality (mean)	0,23	0,28	0,21	**0,23**	0,24	0,22
Number of applications (mean)	101,6	134,9	91,5	**100,6**	104,4	95,1
Number of projects (mean)	31,4	40,9	26,8	**30,8**	32,2	28,8
Success rate (mean)	0,27	0,27	0,26	**0,28**	0,28	0,27
EU funding per application (mean)	147,802	155,814	141,972	**169,073**	159,899	152,491
EU funding per project (mean)	466,055	466,619	423,442	**471,227**	467,217	464,768
Publications (mean)	4,179	4,478	3,465	**4,434**	4,326	4,395
MNCS (mean)	1,03	1,04	0,99	**1,06**	1,06	1,03
ARWU (mean)	292,2	253,1	346,7	**263,5**	280,1	271,0
Partners						
Centrality (mean)	0,16	0,18	0,15	**0,15**	0,17	0,16
Number of applications (mean)	64,2	75,4	62,9	**62,3**	69,7	65,0
Number of projects (mean)	19,9	23,4	19,1	**19,0**	21,9	20,2
Success rate (mean)	0,29	0,30	0,29	**0,29**	0,30	0,29
EU funding per application (mean)	113,874	125,017	111,474	**111,730**	123,957	122,600
EU funding per project (mean)	335,642	357,790	326,232	**329,273**	352,921	349,758
Publications (mean)	3,687	4,017	3,534	**3,707**	3,985	3,950
MNCS (mean)	0,96	0,98	0,95	**0,96**	0,99	0,99
ARWU (mean)	348,7	316,6	363,1	**344,2**	326,4	322,7

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

In the *Collaborative projects* of the *Health* programme, Norway performs relatively well in the HES sector (Table A.26) and the REC sector (Table A.28), where Norway's success rate is five and eight percentage points respectively behind the country with the highest success rate. In the PRC sector Norway has the lowest success rate (Table A.27). The HES sector, with its high level of applications, must be seen as the most important sector in this programme. Here, Norwegian indicator scores are

mostly lower than those of Netherlands, while the differences to the other countries are inconclusive as regards their association with the success rates.

Main points:

- Success rates differ little between the countries, but Norwegian project participants received much less funding than project participants in other countries.

- These results are difficult to explain in light of the consortia indicators, as coordinators in Norwegian projects have generally high scores on the indicators. The main weakness for both coordinators and partners in Norwegian applications, is their relative low level of submitted applications, project participations, and thus their centrality.

5.1.6   Information and Communication Technologies

In the ICT programme of FP7, Norway's success rate was the lowest of the six countries studied in this report (Table 5.1.6), while the average amount of funding the Norwegian partners obtained in the projects was in fact the highest in this sample.

The centrality of coordinators and partners in Norwegian projects are in line with what is being observed in other countries, success rates of these institutions are almost identical in all countries. The coordinators of the Norwegian projects, with experience from other ICT projects in FP7, have on average the highest levels of funding per project, while at the same time coming from less reputed universities. The partners in Norwegian projects display much of the same pattern.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Norwegian HES institutions have the lowest success rates in both *Coordination & support action* applications (Table A.42) and in *Collaborative projects* applications (Table A.43). The coordinators in the former type of applications have scores in line with the other countries' indicator scores, but this is only based on 26 Norwegian applications. The partners' scores display the same patterns as both coordinators and partners in *Collaborative projects;* Norway has lower indicator scores than every other country.

The same pattern is less consistent for PRC applications. Again, in *Collaborative project* applications, Norway's success rate is the lowest and indicator values are in general lower than in the other countries (Table A.44). On most indicators, except the three university indicators, Norway has higher scores than Sweden whose PRC success rate is the highest. This may be interpreted as a lack of solid university partners and may explain some of Norway's relative low success rate in PRC projects.

In PRC applications in *Coordination & support action* (Table A.45), the findings are more in line with the levels of the success rates, i.e. Netherlands (whose success rate is almost twice that of Norway's) and Finland who is also more successful than Norway, have higher indicator scores, whereas Norway's higher success rate compared to Austria is accompanied by higher scores on most indicators.

Table 5.1.6 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Information and Communication Technologies	Netherlands	Sweden	Denmark	Austria	Finland	Norway
Success rate (mean)	18,3	17,7	17,2	16,8	15,6	**14,8**
Projects (N)	718	447	217	497	315	**174**
Rejected (N)	3216	2075	1047	2457	1708	**1004**
Applications (N)	3934	2522	1264	2954	2023	**1178**
Funding per project by nation (*)	1,06	1,00	1,27	1,11	1,13	**613,414**
Participants per application (mean)	9,5	9,2	9,7	9,6	10,0	**10,1**
Coordinators						
Centrality (mean)	0,14	0,12	0,12	0,13	0,15	**0,14**
Number of applications (mean)	251,7	212,1	221,9	247,9	269,6	**240,4**
Number of projects (mean)	46,5	38,7	39,4	44,6	49,6	**44,2**
Success rate (mean)	0,18	0,18	0,17	0,17	0,18	**0,17**
EU funding per application (mean)	81,759	78,766	80,835	73,997	76,743	**78,363**
EU funding per project (mean)	388,223	393,654	392,915	371,673	372,004	**409,629**
Publications (mean)	2,896	2,693	2,553	2,403	2,275	**2,468**
MNCS (mean)	0,95	0,90	0,93	0,88	0,86	**0,87**
ARWU (mean)	405,0	415,3	428,3	450,1	484,6	**450,2**
Partners						
Centrality (mean)	0,09	0,09	0,08	0,09	0,10	**0,09**
Number of applications (mean)	163,4	150,6	144,0	152,2	169,0	**151,8**
Number of projects (mean)	30,4	28,0	26,2	27,8	31,5	**27,6**
Success rate (mean)	0,19	0,19	0,18	0,18	0,18	**0,18**
EU funding per application (mean)	63,780	64,722	60,515	60,759	59,971	**60,538**
EU funding per project (mean)	288,273	292,419	285,528	279,520	278,515	**287,822**
Publications (mean)	3,045	2,890	2,875	2,548	2,523	**2,592**
MNCS (mean)	0,93	0,89	0,91	0,87	0,85	**0,86**
ARWU (mean)	408,4	413,3	421,0	454,6	469,0	**454,7**

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

The contribution of Norway's REC sector to the ICT programme under *Collaborative projects* has the largest volume of Norwegian applications (Table A.46), and for this sector, Norway's success rate (15,6 per cent) is higher than in Austria, Denmark and Sweden, but somewhat behind Netherlands (18,6 per cent) and Finland (16,1 per cent). In general, the latter two countries have higher indicator scores, while the other three countries have lower scores in general than Norway.

When we compare the indicator scores for Norwegian *Collaborative projects* in HES, PRC and REC applications, it is difficult to see a general pattern as to why the HES sector's success rate is so modest compared to PRC and REC (9,2 per cent compared to 14,2 and 15,6 respectively). REC institutions in Norway do not have better universities in their consortia and they do not have more central partners from the larger EU FP networks. However, the REC applications have better scores for the coordinators' level of EU funding per application and per project in the ICT program in FP7 than what the HES institutions have. This may be interpreted as Norwegian REC institutions more inclined than HES institutions to form partnerships with actors who are good at successfully applying for EU funding, without this being reflected in e.g. university level indicators. This difference is less evident among the partners – but Norway's REC sector still has higher scores here as well.

Main points:

- Norway's success rate in the ICT programme is the lowest (as is the volume of applications), but the funding per project is the highest, indicating an incomplete utilization of Norway's potential.

- It is in particular at the university characteristics of coordinators and partners from the HES sector where Norway scores relative lower to the other countries. The Norwegian HES sector's contribution to the programme has in general been less successful than the REC and PRC sectors of Norway.

5.1.7 Joint Technology Initiatives (Annex IV-SP1)

Joint Technology Initiatives are long-term Public-Private Partnerships, supporting large-scale multinational research activities in areas of major interest to European industrial competitiveness and issues of high societal relevance. Norway has been very successful in our applications in this programme, with a much higher success rate than the five other countries in this study, but at the same time achieved far less funding per granted project than other countries (Table 5.1.7).

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.1.7 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Joint Technology Initiatives (Annex IV-SP1)	Norway	Denmark	Sweden	Austria	Netherlands	Finland
Success rate (mean)	40,9	35,6	32,2	30,8	29,9	28,3
Projects (N)	54	78	98	70	146	63
Rejected (N)	78	141	206	157	343	160
Applications (N)	132	219	304	227	489	223
Funding per project by nation (*)	430,964	0,71	0,82	0,65	0,35	0,82
Participants per application (mean)	16,1	15,5	14,3	17,0	14,7	17,7
Coordinators						
Centrality (mean)	0,19	0,15	0,12	0,17	0,15	0,18
Number of applications (mean)	27,5	24,5	18,0	23,9	22,6	30,0
Number of projects (mean)	11,6	9,3	6,7	9,0	8,6	10,4
Success rate (mean)	0,37	0,36	0,38	0,34	0,36	0,31
EU funding per application (mean)	130,892	148,630	126,336	174,515	172,444	133,168
EU funding per project (mean)	431,581	499,474	490,782	565,424	549,582	552,290
Publications (mean)	3,189	4,201	4,125	3,512	4,044	2,805
MNCS (mean)	0,86	1,02	1,02	0,99	1,05	0,90
ARWU (mean)	411,6	293,0	298,7	342,3	298,8	439,5
Partners						
Centrality (mean)	0,13	0,11	0,10	0,13	0,12	0,12
Number of applications (mean)	17,9	16,4	14,3	16,4	16,7	17,5
Number of projects (mean)	6,9	5,8	4,8	6,1	5,9	5,9
Success rate (mean)	0,38	0,34	0,33	0,36	0,33	0,29
EU funding per application (mean)	96,283	135,784	107,793	96,610	118,583	83,235
EU funding per project (mean)	227,796	379,625	348,753	257,094	335,830	250,473
Publications (mean)	3,010	3,602	3,501	2,911	3,407	2,943
MNCS (mean)	0,91	0,99	0,96	0,91	0,97	0,91
ARWU (mean)	407,7	344,7	353,5	416,8	367,6	423,6

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

Norway's main strength compared to the other countries is the centrality and experience from applications and projects from the coordinators in the consortia involving Norwegian institutions. At the same time, compared to the other countries, Norwegian applications has not involved equally reputed universities. And even though the coordinators and partners in the Norwegian consortia have been active in other consortia, they have not achieved the same level of funding as the coordinators and partners in the other countries. It is in particular Netherlands who stand out compared to Norway with higher funding per project, where in particular the Dutch coordinators have been involved in other projects with relative high funding compared to Norway.

Main points:

- Norway has the highest success rate, but the lowest funding per project in the programme.
- Coordinators and partners in Norwegian projects are characterized by a history of many applications and many projects – but in small projects with lower funding than in other countries.

5.1.8   Nanosciences, Nanotechnologies, Materials and new Production Technologies

Norway's success rate in the programme *Nanosciences, Nanotechnologies, Materials and new Production Technologies* of FP7 is 3,1 percentage points below Denmark's and 4,2 percentage points above Sweden's (Table 5.1.8). Norway's main disadvantage appears to be lower scores among the partners, but the difference in indicator scores amongst both coordinators and partners are in general modest between the countries. Norway's funding per project is higher than in the Danish projects, and lower than in the Swedish projects, i.e. there is little coherence between a country's success rate and its average funding.

In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

At sector level, it is Norway's HES sector that has the lowest success rate (20,5 per cent) in the *Collaborative project* applications, both compared to countries' HES sectors (Table A.47) and compared with other sectors in Norway; PRC (29,4 per cent, Table A.48) and REC (25,5 per cent, Table A.49) both perform better. While indicator scores for HES are generally lower in Norway compared to other countries, we find that among coordinators in Norwegian PRC applications, Norway's coordinator scores are fully in line with those of Denmark, Finland and Netherlands, illustrating that as the differences in success rates are very small, indicator differences will often be small too. Norway's PRC coordinators and partners have more systematically lower values than those of e.g. Denmark, whose success rate in PRC projects is much higher than for Norway (39 per cent versus 25,5 per cent).

Table 5.1.8 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Nanosciences, Nanotechnologies, Materials and new Production Technologies	Denmark	Netherlands	Norway	Austria	Finland	Sweden
Success rate (mean)	31,7	28,6	28,6	28,3	26,7	24,4
Projects (N)	151	274	82	144	165	178
Rejected (N)	325	685	205	365	453	553
Applications (N)	476	959	287	509	618	731
Funding per project by nation (*)	1,10	0,92	597,031	1,18	1,02	0,81
Participants per application (mean)	11,8	11,5	13,8	12,9	11,3	10,7
Coordinators						
Centrality (mean)	0,15	0,16	0,17	0,17	0,17	0,11
Number of applications (mean)	96,9	99,1	110,9	115,2	112,1	68,6
Number of projects (mean)	26,5	27,8	29,0	30,2	28,9	17,8
Success rate (mean)	0,27	0,27	0,27	0,25	0,27	0,26
EU funding per application (mean)	126,826	124,338	132,586	113,924	117,047	117,892
EU funding per project (mean)	407,654	391,644	418,607	377,927	389,011	390,962
Publications (mean)	3,064	3,316	2,760	2,611	2,445	3,119
MNCS (mean)	0,99	1,00	0,94	0,89	0,89	0,94
ARWU (mean)	371,7	357,7	388,8	441,4	456,1	361,8
Partners						
Centrality (mean)	0,08	0,07	0,07	0,07	0,08	0,06
Number of applications (mean)	42,4	41,0	40,7	39,9	44,5	34,1
Number of projects (mean)	12,1	11,7	11,2	11,0	12,2	9,4
Success rate (mean)	0,33	0,33	0,32	0,30	0,32	0,31
EU funding per application (mean)	97,280	95,529	88,457	88,268	90,048	89,961
EU funding per project (mean)	253,914	250,458	243,177	235,472	242,696	242,497
Publications (mean)	3,242	3,085	2,927	2,732	2,661	3,091
MNCS (mean)	0,95	0,94	0,93	0,90	0,87	0,92
ARWU (mean)	385,8	402,4	406,4	437,5	459,5	394,5

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

Main points:

- Norway has both the third highest success rate and the third highest funding per project.

- It is the HES sector of Norway who has the lowest success rate, and it is also at the HES indicators (publications, citation indicator and the Shanghai ranking) where both coordinators and partners in Norwegian applications display the lowest scores in Norwegian consortia.

5.1.9 Research Infrastructures

Norway has the highest success rate in the FP7 programme for *Research infrastructure*s (Table 5.1.9). There is little consistency in how indicators scores relate to overall success rates, and also how they relate to the mean funding per projects.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.1.9 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Research Infrastructures	Norway	Denmark	Finland	Sweden	Netherlands	Austria
Success rate (mean)	54,8	53,1	52,0	48,6	47,9	43,9
Projects (N)	74	78	89	103	197	79
Rejected (N)	61	69	82	109	214	101
Applications (N)	135	147	171	212	411	180
Funding per project by nation (*)	343,676	0,77	1,01	0,79	0,59	1,38
Participants per application (mean)	21,1	20,5	21,1	18,3	16,2	19,1
Coordinators						
Centrality (mean)	0,23	0,22	0,23	0,22	0,22	0,19
Number of applications (mean)	33,5	32,4	37,4	35,2	36,3	30,1
Number of projects (mean)	17,9	17,0	19,5	17,9	18,4	15,1
Success rate (mean)	0,52	0,48	0,49	0,47	0,48	0,45
EU funding per application (mean)	244,188	351,432	252,606	224,870	263,520	259,072
EU funding per project (mean)	420,668	657,068	451,379	399,938	476,771	479,386
Publications (mean)	4,159	3,873	4,046	3,809	4,467	3,075
MNCS (mean)	1,02	0,98	0,97	0,98	1,04	0,90
ARWU (mean)	290,6	323,6	327,1	323,9	292,5	387,0
Partners						
Centrality (mean)	0,15	0,15	0,16	0,16	0,15	0,14
Number of applications (mean)	19,6	19,1	21,2	21,3	21,4	19,2
Number of projects (mean)	10,4	10,1	11,1	11,1	11,0	9,8
Success rate (mean)	0,55	0,55	0,53	0,52	0,52	0,50
EU funding per application (mean)	133,451	142,973	138,948	146,578	143,478	126,839
EU funding per project (mean)	230,895	253,452	248,785	265,400	257,002	226,935
Publications (mean)	3,231	3,347	3,427	3,430	3,504	3,289
MNCS (mean)	0,92	0,94	0,94	0,94	0,94	0,92
ARWU (mean)	380,4	372,7	364,8	363,3	369,1	384,6

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

In *Combination of CP & CSA* applications, Norwegian success rates are high in all three sectors (Tables A.50 to A.52). Both the HES and REC applications have the highest success rate, but in general lower indicator scores than other countries (the one exception is in the university indicators). It is thus difficult to explain the high success rate relative to other countries. In PRC sector applications, Finland has clearly the highest success rate (77 per cent, 22 percentage points above Norway), and here the Finnish scores are higher on all indicators both for coordinators and partners, when comparing with Norwegian scores.

Main points:

- Norway has the highest success rate in the programme, but lower funding per project compared to Denmark, Sweden and Netherlands.

- We are not able to explain differences in success rates in the countries based on our indicators. However, differences in funding per project is more in line with the indicator scores, with Norway's higher funding relative to Austria og and lower funding relative to Netherlands clearly associated with consortia indicator scores.

5.1.10 Science in Society

Norway's success rate in *Science in Society* is 'medium' in the selection of countries in Table 5.1.10, but the general funding in the projects is higher than in all countries; from only marginally higher than in Danish, Dutch and Austrian projects, to 47 and 67 per cent higher than in Finnish and Swedish projects respectively.

Overall, the partners in the Norwegian consortia perform better on all indicators than the other countries. At the coordinator side, Norway is generally below Netherlands, and Denmark in particular, whose success rate is the highest. Compared to Sweden, the coordinators in Norwegian consortia score slightly better on almost all indicators, but yet Sweden's success rate is some 2,6 percentage points above Norway's.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.1.10 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Science in Society	Denmark	Sweden	Netherlands	Norway	Austria	Finland
Success rate (mean)	31,8	28,2	27,8	25,6	22,9	20,7
Projects (N)	49	49	80	31	50	31
Rejected (N)	105	125	208	90	168	119
Applications (N)	154	174	288	121	218	150
Funding per project by nation (*)	1,06	1,67	1,04	263,088	1,04	1,47
Participants per application (mean)	15,5	14,1	13,0	13,9	14,2	14,5
Coordinators						
Centrality (mean)	0,20	0,15	0,16	0,18	0,16	0,17
Number of applications (mean)	11,2	8,8	9,5	10,3	10,2	12,1
Number of projects (mean)	3,0	2,1	2,6	2,8	2,5	2,4
Success rate (mean)	0,26	0,26	0,27	0,27	0,23	0,19
EU funding per application (mean)	82,753	72,497	80,619	74,881	70,325	59,404
EU funding per project (mean)	241,414	209,938	210,984	208,790	231,912	211,367
Publications (mean)	3,193	2,675	3,145	2,835	2,035	2,679
MNCS (mean)	0,88	0,81	0,89	0,86	0,77	0,85
ARWU (mean)	385,5	475,0	403,4	418,1	499,6	443,2
Partners						
Centrality (mean)	0,16	0,15	0,15	0,17	0,13	0,16
Number of applications (mean)	7,9	7,9	8,0	9,0	7,8	9,3
Number of projects (mean)	2,1	1,9	2,0	2,2	1,8	2,1
Success rate (mean)	0,27	0,27	0,26	0,28	0,23	0,23
EU funding per application (mean)	39,432	36,342	38,256	40,203	33,511	31,448
EU funding per project (mean)	101,014	103,505	102,925	112,792	97,968	96,997
Publications (mean)	2,361	2,049	2,408	2,494	2,060	2,224
MNCS (mean)	0,79	0,75	0,80	0,80	0,75	0,77
ARWU (mean)	491,9	524,1	489,6	472,8	528,6	515,5

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

Norway's success rate in the HES sector is better in the *Collaborative* applications (Table A.55) compared to *Coordination & support action* applications (Table A.55), 33,3 and 24,6 per cent respectively. Sweden's HES sector, on the other hand, performs better in *Coordination & support action* (25 per cent) than in *Collaborative projects* (14,3 per cent). Both at the overall level, and for the

two action types in the HES sector consortia, the pattern is rather similar. Norway's higher success rate relative to Austria and Finland is associated with indicator values corresponding to the success rate hierarchy, whereas the countries ahead of Norway cannot be ascribed higher values to Norway in general.

Main points:

- Norway's fourth highest success rate, is accompanied by the highest level of funding per project in the sample of six countries.

- The partners in the Norwegian applications are very strong, based on their consortia characteristics, but coordinators in projects where Norway participates are not as strong as in Denmark and Netherlands whose success rates are higher, and whose funding is only marginally lower than Norway's.

5.1.11 Security

Norway's success rate in the *Security* programme was the highest among the six countries studied here and, considering Norway's size relative to these other countries, a programme where we applied much more than for example Denmark and Sweden. However, the funding that Norwegian projects received under the *Security* programme was lower than in Austria and Netherlands, and only half as big as the funding in Swedish projects.

The indicator scores clearly show that Norwegian consortia have involved very successful partners, whose effectiveness in receiving funding under the programme was solid. At the same time, these partners (including the coordinators) did not come from as reputed universities as most other countries may show for (Table 5.1.11). Analyzing the *Collaborative projects* at sector level elaborates this.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Norway's good results are firmly rooted in consortia from the REC sector (Table A.66) and PRC sector (Table A.64), both having the highest success rates in the sample, while Norway's HES sector has a much lower success rate, in line with those of Sweden and Finland, higher than Denmark (whose participation in the Security programme is low), and lower than for Netherlands and Austria. It is in particular PRC consortia in Norway that have found coordinators with high levels of EU funding per application and project in the *Security* programme. The high success rate of Norway's REC sector in *Collaborative projects* is more difficult to explain, as the indicator values display a very inconclusive pattern relative to other countries' scores. In *Coordination & support action* consortia with Norwegian participation, it is only the REC sector that has more than twenty applications. Here, the success rate is high (38 per cent), and indicator scores generally coincide with Netherland's higher success rate and Austria's lower success rate (Table A.65).

Table 5.1.11 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Security	Norway	Austria	Netherlands	Finland	Denmark	Sweden
Success rate (mean)	26,4	24,1	23,2	23,0	21,7	20,9
Projects (N)	68	78	135	70	33	71
Rejected (N)	190	246	447	235	119	268
Applications (N)	258	324	582	305	152	339
Funding per project by nation (*)	472,015	0,84	0,77	0,98	1,09	0,50
Participants per application (mean)	12,6	12,4	12,5	13,4	13,0	11,5
Coordinators						
Centrality (mean)	0,14	0,14	0,20	0,16	0,10	0,12
Number of applications (mean)	34,9	37,5	50,0	41,3	27,0	29,7
Number of projects (mean)	10,2	10,3	14,6	11,2	6,8	8,3
Success rate (mean)	0,26	0,22	0,23	0,24	0,20	0,24
EU funding per application (mean)	131,636	102,990	113,568	119,358	106,168	115,976
EU funding per project (mean)	408,842	359,278	369,324	392,855	413,400	373,712
Publications (mean)	1,901	2,125	2,826	2,377	2,943	2,707
MNCS (mean)	0,83	0,80	0,89	0,88	0,95	0,90
ARWU (mean)	498,6	510,2	434,4	452,6	408,9	415,3
Partners						
Centrality (mean)	0,09	0,08	0,10	0,10	0,09	0,07
Number of applications (mean)	22,7	20,3	24,7	24,8	21,5	18,2
Number of projects (mean)	6,0	5,3	6,6	6,4	5,6	4,6
Success rate (mean)	0,25	0,25	0,24	0,23	0,24	0,22
EU funding per application (mean)	84,315	76,045	77,754	76,027	75,711	74,332
EU funding per project (mean)	250,657	223,738	236,924	234,414	231,295	227,425
Publications (mean)	2,199	2,058	2,459	2,125	2,428	2,425
MNCS (mean)	0,78	0,77	0,83	0,78	0,82	0,81
ARWU (mean)	510,7	527,2	483,7	519,7	481,9	479,3

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

Main points:

- Norway has the highest success rate in the programme, but generally lower funding per project compared to other countries.

- Coordinators and partners in applications where Norway participates have been successful in terms of their success rates and funding levels, but are 'smaller' than in many other countries, i.e. have been involved in fewer applications and projects, and are not from as big and reputed universities.

5.1.12 Socio-economic sciences and Humanities

Norway is ranked fourth in the programme for *Socio-economic sciences and Humanities*, but in reality very little differs between Netherlands, having the highest success rate and Norway (Table 5.1.12). Norway's funding per project, however, is the lowest in the sample, almost equal to Denmark's, but much lower than in the other countries.

The small differences in success rates are recognized in small differences on indicator scores. The most consistent pattern is that Norwegian coordinators are less central and have been involved in fewer applications and projects. This is so for both countries with higher and lower success rates than Norway. On the other hand, Norwegian coordinators and partners are generally from more reputed universities.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.1.12 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Socio-economic sciences and Humanities	Denmark	Netherlands	Austria	Norway	Sweden	Finland
Success rate (mean)	14,6	14,1	13,6	**13,4**	11,1	9,7
Projects (N)	60	124	79	**48**	56	51
Rejected (N)	352	756	503	**309**	447	476
Applications (N)	412	880	582	**357**	503	527
Funding per project by nation (*)	0,97	0,57	0,75	**248,607**	0,75	0,65
Participants per application (mean)	11,3	10,8	11,1	**11,0**	10,7	11,0
Coordinators						
Centrality (mean)	0,22	0,25	0,21	**0,20**	0,22	0,20
Number of applications (mean)	35,9	38,5	33,8	**33,7**	36,2	35,7
Number of projects (mean)	5,0	5,8	4,9	**4,6**	5,1	4,6
Success rate (mean)	0,13	0,14	0,14	**0,14**	0,13	0,12
EU funding per application (mean)	43,081	45,129	42,736	**44,689**	38,229	37,294
EU funding per project (mean)	235,356	237,008	220,212	**256,662**	218,825	212,593
Publications (mean)	2,907	3,240	2,557	**3,190**	2,760	2,608
MNCS (mean)	0,86	0,90	0,81	**0,91**	0,84	0,83
ARWU (mean)	449,0	411,8	476,1	**390,3**	450,0	464,1
Partners						
Centrality (mean)	0,18	0,18	0,16	**0,17**	0,17	0,15
Number of applications (mean)	29,3	28,5	26,0	**26,9**	29,3	27,2
Number of projects (mean)	4,1	4,1	3,6	**3,7**	3,9	3,4
Success rate (mean)	0,15	0,14	0,14	**0,15**	0,13	0,12
EU funding per application (mean)	29,481	29,472	28,321	**29,198**	25,902	25,797
EU funding per project (mean)	152,170	149,611	139,930	**150,665**	145,048	141,047
Publications (mean)	2,309	2,527	2,095	**2,354**	2,328	2,163
MNCS (mean)	0,77	0,80	0,75	**0,77**	0,77	0,76
ARWU (mean)	508,7	485,6	527,7	**495,2**	498,1	521,0

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

These results demonstrate the need to break down overall scores at lower levels. When we look at the only two sectors with more than 20 applications from Norway, which is *Collaborative projects* in the HES sector (Table A.69) and in the REC sector (Table A.70), we see that both of these sectors have

lower success rates than the country total for Norway, i.e. the small number of applications and funded projects from the PUB and PRC sector in Norway lifts up the success rate somewhat. In the *Collaborative projects*, the REC sector scores better than the HES sector in having coordinators from reputed universities.

Main points:

- Norway's success rate is not much below Denmark's whose success rate is the highest, but the funding per project is generally lower for Norwegian project participants.

- Coordinators of Norwegian projects appear to come from somewhat 'smaller' institutions than in other countries, i.e. have been involved in fewer applications and projects.

5.1.13 Space

Norway's success rate in the *Space* programme slightly higher than Finland's and Denmark's, and the highest in our sample (Table 5.1.13). The funding that the Norwegian projects have received are higher than in most countries (only marginally below Sweden, but 34-77 per cent higher than for all other countries). Looking at the indicator scores, the only consistent finding from a Norwegian point of view, is that the university participants in Norwegian consortia score lower on the university indicators. It is in particular on the partner side – not among coordinators – that Norway in general perform better than the other countries on the indicators.

The Norwegian contribution to *Collaborative projects* in the *Space* programme is dominated by the REC sector, whose success rate is 45,9 per cent and second highest in the sample, but much lower than for Denmark (Table A.72). Here, compared to Denmark, the indicators consistently show more preferable indicator scores for Danish coordinators, whereas Norway's partners have better scores. In general, Norwegian consortia have better scores than in countries with lower success rates, but this is more consistent for the consortia partners, to a lesser degree the coordinators. The PRC consortia from Norway have a much lower success rate (25,7 per cent) in the *Collaborative projects*, and again, the main pattern is lower scores for the coordinators – not the partners (Table A.71).

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.1.13 Consortia characteristics for coordinators and partners in applications from six countries Green value = higher score for Norway, red value = lower score for Norway)

Space	Norway	Finland	Denmark	Netherlands	Austria	Sweden
Success rate (mean)	37,6	37,4	36,1	34,6	31,2	26,3
Projects (N)	38	49	30	80	53	26
Rejected (N)	63	82	53	151	117	73
Applications (N)	101	131	83	231	170	99
Funding per project by nation (*)	561,791	1,45	1,77	1,34	1,76	0,94
Participants per application (mean)	12,2	11,0	11,3	10,8	10,9	9,1
Coordinators						
Centrality (mean)	0,17	0,17	0,21	0,20	0,20	0,16
Number of applications (mean)	21,0	22,1	28,0	27,6	27,0	24,5
Number of projects (mean)	7,9	8,5	11,0	10,1	10,3	8,9
Success rate (mean)	0,36	0,36	0,38	0,32	0,33	0,34
EU funding per application (mean)	173,059	143,706	151,681	126,795	137,405	129,909
EU funding per project (mean)	407,201	342,856	354,763	307,008	302,991	274,309
Publications (mean)	2,747	3,581	3,834	3,715	3,025	3,508
MNCS (mean)	0,95	1,01	1,08	1,03	0,92	1,04
ARWU (mean)	394,8	299,5	280,8	294,8	417,4	304,8
Partners						
Centrality (mean)	0,17	0,16	0,15	0,14	0,14	0,11
Number of applications (mean)	16,1	16,5	16,1	14,9	15,4	13,3
Number of projects (mean)	6,6	6,5	6,3	5,7	5,7	4,6
Success rate (mean)	0,42	0,42	0,44	0,39	0,37	0,33
EU funding per application (mean)	114,844	106,996	95,357	91,800	99,771	73,868
EU funding per project (mean)	238,795	241,585	209,174	199,060	241,051	179,143
Publications (mean)	2,934	3,027	3,407	3,395	2,755	3,015
MNCS (mean)	0,89	0,92	0,96	0,95	0,88	0,93
ARWU (mean)	416,8	392,8	368,8	375,3	431,4	368,8

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

Main points:

- Norway's participation in the programme has been very successful. Norway has both the highest success rate, the highest funding per project, and compared by country size Norway has had a much higher activity than e.g. Sweden and Denmark.

- The Norwegian success has taken place without the presence of coordinators and partners from equally strong universities as in the other countries, illuminated by the REC sector's strong contribution to the programme in Norway – not the HES sector.

5.1.14 Transport (including Aeronautics)

Norway's success rate in the *Transport* programme of FP7 comes out with the lowest success rate – 27,1 per cent – but this is not very much lower compared to e.g. Austria, Netherlands and Finland (Table 5.1.14), with Norway's mean funding per project clearly below Sweden and Netherlands, but almost identical to Denmark's and 14 and 20 per cent higher than in Austrian and Finnish projects respectively. The overall pattern of the indicator scores is that they are lower for both coordinators and partners in Norwegian consortia.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.1.14 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Transport (including Aeronautics)	Sweden	Denmark	Austria	Netherlands	Finland	Norway
Success rate (mean)	34,6	31,9	29,6	29,3	27,6	27,1
Projects (N)	191	66	150	298	78	68
Rejected (N)	361	141	356	718	205	183
Applications (N)	552	207	506	1016	283	251
Funding per project by nation (*)	0,70	1,04	1,14	0,90	1,20	421,707
Participants per application (mean)	14,0	13,8	12,4	12,6	13,8	14,0
Coordinators						
Centrality (mean)	0,21	0,17	0,19	0,22	0,20	0,19
Number of applications (mean)	53,8	45,0	54,4	66,6	55,3	54,1
Number of projects (mean)	18,0	14,1	17,1	20,8	16,3	15,8
Success rate (mean)	0,34	0,31	0,29	0,30	0,28	0,28
EU funding per application (mean)	129,075	138,414	101,757	107,094	106,649	95,766
EU funding per project (mean)	297,138	304,298	251,074	279,000	255,458	270,241
Publications (mean)	3,211	2,708	2,383	3,048	2,584	2,534
MNCS (mean)	0,98	0,92	0,89	0,99	0,89	0,91
ARWU (mean)	381,4	446,5	468,0	377,4	468,5	476,8
Partners						
Centrality (mean)	0,15	0,11	0,12	0,16	0,12	0,12
Number of applications (mean)	35,3	27,1	31,7	42,5	29,8	28,1
Number of projects (mean)	11,9	8,4	10,1	13,3	9,3	8,6
Success rate (mean)	0,37	0,36	0,33	0,33	0,32	0,32
EU funding per application (mean)	95,172	84,177	78,362	83,723	73,556	72,077
EU funding per project (mean)	210,835	184,212	181,618	201,392	171,576	172,544
Publications (mean)	2,809	2,557	2,485	2,709	2,287	2,526
MNCS (mean)	0,88	0,88	0,84	0,88	0,81	0,84
ARWU (mean)	432,9	465,9	479,5	449,8	517,8	480,9

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

In *Collaborative projects*, this is especially so for Norway's HES sector consortia (Table A.73), where the sector's success rate by far is the lowest in the sample, only 9,1 per cent, compared to success rates in the range 23,2 – 33,5 in other countries. Here, the indicator scores are constantly much higher in all other countries. In the PRC consortia, Norway's success rate in *Collaborative projects* is much more in line with those in the other countries, but still the indicator scores are consistently lower for Norway (Table A.74). The REC sector's contribution to *Collaborative projects* resulted in the lowest success rate in the sample (23,9 per cent, which is nevertheless nowhere as low as for HES consortia) (Table A.76). Here, there is a clear divide between the two countries with success rates just above

Norway (Denmark and Austria), where indicator scores vary irregularly between these countries and Norway, while the three countries with much higher success rates (Finland, Sweden and Netherlands) have markedly better indicator scores from Norway.

Norway's REC consortia also have the lowest success rate in *Coordination & support action* applications, with much higher success rates in Netherlands, Austria and Finland (Table A.75). Here, Norway has better coordinators than top-placed Netherlands at university indicators, but lower values on all other indicators. The differences to Austria and Finland on indicator scores appear random.

Main points:

- Norway has the lowest success rate, but higher funding per project than in Denmark, Austria and Finland.

- Overall, there is a solid correspondence between the countries' success rates and their indicator scores – for both coordinators and partners. That is, the more experienced, successful and merited they are, the higher the success rates.

5.2 Horizon 2020 Programmes

5.2.1 Climate action, environment, resource efficiency and raw materials

The number of applications to the programme *Climate action, environment, resource efficiency and raw materials* was low at the time we extracted data from the ECORDA database, with just 51 applications coming from Norway (Table 5.2.1). Of these, 27 had contributions from the REC sector (Table A.12), with a success rate of 25,9 per cent – some 7,4 percentage points below Norway's national success rate.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.2.1 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Climate action, environment, resource efficiency and raw materials	Norway	Denmark	Netherlands	Austria	Sweden	Finland
Success rate (mean)	**33,3**	27,0	26,9	26,7	26,0	25,5
Projects (N)	**17**	17	49	28	25	24
Rejected (N)	**34**	46	133	77	71	70
Applications (N)	**51**	63	182	105	96	94
Funding per project by nation (*)	**776,187**	1,84	0,85	1,94	0,95	1,60
Participants per application (mean)	**19,2**	15,5	15,1	16,1	14,4	15,3
Coordinators						
Centrality (mean)	**0,31**	0,21	0,22	0,27	0,23	0,26
Number of applications (mean)	**9,0**	6,9	7,6	9,1	7,0	8,6
Number of projects (mean)	**2,7**	2,0	2,1	2,5	2,2	2,6
Success rate (mean)	**0,33**	0,26	0,26	0,27	0,28	0,27
EU funding per application (mean)	**198,034**	138,197	147,794	119,894	141,260	127,388
EU funding per project (mean)	**446,562**	291,759	349,729	322,717	311,330	318,944
Publications (mean)	**3,339**	3,481	2,785	2,625	2,754	2,724
MNCS (mean)	**1,02**	0,99	0,93	0,92	0,92	0,89
ARWU (mean)	**315,3**	350,6	411,6	448,6	401,0	435,9
Partners						
Centrality (mean)	**0,21**	0,18	0,16	0,19	0,18	0,19
Number of applications (mean)	**5,2**	4,9	4,9	5,2	4,9	5,8
Number of projects (mean)	**1,8**	1,6	1,5	1,6	1,6	1,8
Success rate (mean)	**0,37**	0,31	0,30	0,31	0,31	0,29
EU funding per application (mean)	**121,194**	93,066	93,886	93,596	99,655	87,818
EU funding per project (mean)	**231,948**	189,115	196,626	203,584	199,682	197,314
Publications (mean)	**2,925**	2,853	2,795	2,875	2,655	2,908
MNCS (mean)	**0,93**	0,90	0,87	0,88	0,87	0,87
ARWU (mean)	**397,3**	411,4	443,5	435,1	437,7	434,1

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

At this early stage of the climate programme, Norway's highest success rate stands out, i.e. it is higher than in all other countries, whose success rates are rather identical. Norway's funding per project is slightly lower than in Netherlands and Sweden, but markedly higher than in the other countries: from 60 per cent higher than in Finland to 94 per cent higher in Austria. Also, Norway stands out with consistently higher scores on all indicators, foremost a higher mean number of participants per

application, higher centrality of the coordinators, and coordinators and partners that have received more funding in total from the programme. Comparing the climate programmes of FP7 and Horizon 2020, a stable pattern is observed. The success rate ranking is almost identical – only Sweden and Finland change positions. Norwegian university indicator values are relatively higher in Horizon 2020, the mean number of participants per application has gone up from 15,3 to 19,2 with much smaller changes in the other countries, and the centrality of the coordinators in Horizon 2020 is much higher. These observations, though, are based on a very small number of projects.

Main points:

- Norway has been very successful in this programme, with both the highest success rate and very high funding per project: clearly above Denmark, Austria and Finland, but slightly lower than Netherlands and Sweden.

- Both coordinators and partners in projects where Norway participates score better than in the other countries' projects, i.e. Norway has more experienced, successful and reputed collaborators.

5.2.2 *Europe in a changing world - inclusive, innovative and reflective Societies*

The success rates in the programme *Europe in a changing world - inclusive, innovative and reflective Societies* are in general modest, with 9,3 success rate for Norwegian applications, which is one percentage point below Denmark and 2,7 percentage points above Finland (Table 5.2.2). As indicated by the values for mean number of projects, few application participants have been involved in many projects. The indicator differences between the six countries are inconclusive, although there is a tendency that higher Danish success rate compared to Norway's coincides with higher indicator scores, whereas Norway's indicator scores compared to the country with the lowest success rate coincides with higher Norwegian indicator scores. In general, the funding of the Norwegian projects has on average been higher than in the other countries. It is important to note though, that this finding is based on just 15 Norwegian projects, and thus highly susceptible to future changes.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality of the coordinators and partners). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

In the *Research and Innovation action* projects of this programme, the consortia where Norway's PRC or REC sector participates perform weakly with low scores on most indicators (Table A.21 and A.22). The Norwegian HES sector has the highest success rate in our sample (Table A.20), but it is almost identical to that of Netherlands and Denmark, and compared to these two countries, the Norwegian consortia have much lower indicator scores. On the other hand, Norwegian consortia scores are substantially better than those of Finland and Austria (both with much lower success rates than Norway).

Table 5.2.2 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Europe in a changing world – inclusive, innovative and reflective Societies	Denmark	Norway	Sweden	Austria	Netherlands	Finland
Success rate (mean)	10,3	9,3	8,7	8,0	7,2	6,6
Projects (N)	19	15	19	25	30	14
Rejected (N)	165	147	199	287	388	197
Applications (N)	184	162	218	312	418	211
Funding per project by nation (*)	1,79	443,842	1,35	1,23	1,09	1,19
Participants per application (mean)	10,9	10,5	10,7	10,8	10,5	10,4
Coordinators						
Centrality (mean)	0,14	0,12	0,12	0,12	0,13	0,12
Number of applications (mean)	17,8	13,9	15,6	14,0	16,9	15,3
Number of projects (mean)	1,4	1,1	1,1	1,2	1,3	1,1
Success rate (mean)	0,09	0,08	0,07	0,08	0,07	0,06
EU funding per application (mean)	29,916	31,272	21,695	23,027	22,277	20,307
EU funding per project (mean)	198,590	194,421	146,974	137,403	176,592	145,273
Publications (mean)	2,782	2,413	2,502	2,042	2,927	2,150
MNCS (mean)	0,88	0,84	0,82	0,78	0,88	0,81
ARWU (mean)	417,0	445,7	445,7	512,3	426,9	486,1
Partners						
Centrality (mean)	0,11	0,09	0,09	0,09	0,09	0,08
Number of applications (mean)	11,9	10,6	10,8	10,1	11,0	9,9
Number of projects (mean)	1,0	0,9	0,9	0,9	0,9	0,7
Success rate (mean)	0,10	0,10	0,09	0,10	0,08	0,09
EU funding per application (mean)	20,773	20,694	19,151	20,265	17,541	18,288
EU funding per project (mean)	110,063	99,261	103,790	89,983	101,814	88,085
Publications (mean)	2,430	2,367	2,310	2,166	2,546	1,936
MNCS (mean)	0,79	0,76	0,77	0,75	0,80	0,72
ARWU (mean)	492,9	509,2	497,6	523,5	488,5	552,9

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

Main points:

- Norway has the second highest success rate and the highest funding per application among the six countries.

- There is a clear tendency that Norway has had stronger coordinators and partners than in all countries with lower success rates, while Denmark, whose success rate is the highest, has coordinators and partners with better consortia scores than Norway.

5.2.3 *Food security, sustainable agriculture and forestry, marine and maritime and inland water research*

Compared to the FP7 programme *Food, Agriculture and Biotechnology*, Norway's success rate is slightly lower in Horizon 2020's programme for *Food security sustainable agriculture and forestry, marine and maritime and inland water research.* To the extent that the two programmes can be compared, the success rate has decreased from 24,7 to 23,8 per cent. Such a modest reduction is found in Denmark, Sweden and Austria as well, while Netherlands (from 27,0 to 21,7) and Finland (from 22,6 to 16,2) have been subject to more substantial reductions. Again, the number of applications from Horizon 2020 that we base this on is low. In Horizon 2020, the average number of participants per application has gone up in all countries. In Norway, from 15,0 to 18,7. The lowest increase has been in the Dutch projects (from 14,1 to 14,6 participants). Norway's high success rate

does not differ much from what we see in other countries (except in Finland), and when we look at mean funding per project we are lower than all countries except Austria.

Norway has the highest number of participants in the applications, and both coordinators and partners have higher success rates (Table 5.2.3). However, the university partners in the Norwegian consortia are in general not as strong as in the other countries. In *Research and Innovation* projects, the latter point is illustrated by relative low scores of the Norwegian HES sector applications on the university indicators (Table A.7).

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.2.3 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Food security, sustainable agriculture And forestry, marine and maritime and inland water research	Norway	Denmark	Sweden	Netherlands	Austria	Finland
Success rate (mean)	23,8	23,3	22,7	21,7	20,3	16,2
Projects (N)	20	28	17	45	14	16
Rejected (N)	64	92	58	162	55	83
Applications (N)	84	120	75	207	69	99
Funding per project by nation (*)	428,089	0,92	0,74	0,60	1,85	0,76
Participants per application (mean)	18,7	16,8	15,7	14,5	18,4	14,4
Coordinators						
Centrality (mean)	0,24	0,29	0,19	0,26	0,20	0,23
Number of applications (mean)	15,6	18,9	14,0	20,2	15,3	17,6
Number of projects (mean)	3,7	4,8	3,3	4,6	3,4	4,0
Success rate (mean)	0,23	0,23	0,22	0,21	0,21	0,20
EU funding per application (mean)	113,364	101,392	131,889	119,708	65,640	82,943
EU funding per project (mean)	391,593	338,169	298,881	366,978	236,555	241,388
Publications (mean)	3,339	3,857	2,943	3,281	2,801	3,327
MNCS (mean)	0,92	0,98	0,90	0,96	0,85	0,91
ARWU (mean)	400,8	340,9	393,5	370,8	448,4	365,4
Partners						
Centrality (mean)	0,12	0,12	0,10	0,11	0,10	0,09
Number of applications (mean)	6,7	7,1	6,7	7,6	7,1	6,9
Number of projects (mean)	1,5	1,6	1,5	1,7	1,5	1,4
Success rate (mean)	0,25	0,24	0,22	0,23	0,19	0,19
EU funding per application (mean)	62,086	58,236	61,082	59,370	41,734	46,374
EU funding per project (mean)	153,875	144,130	145,137	148,926	123,243	123,109
Publications (mean)	2,491	2,757	2,818	2,787	2,552	2,556
MNCS (mean)	0,84	0,86	0,86	0,85	0,85	0,83
ARWU (mean)	472,2	445,8	433,9	450,4	467,5	466,0

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

Both the HES sector (Table A.7) and the PRC sector in Norway (Table A.8) have lower success rates than the total for Norway. It is Norway's REC sector that lifts up the national success rate (success rate of 26 per cent).

Main points:

- Norway has the highest success rate so far in the programme, but low level of funding per project.

- We are not able to see any systematic variations between the countries that may explain differences in success rates or funding per project.

5.2.4   Future and Emerging Technologies

At the time of our data extraction from ECORDA, Norway had only gotten one project funded from the programme *Future and Emerging Technologies* (Research and innovation action) (Table 5.2.4). The success rates are low in all countries, but Austria can demonstrate almost six times as many funded projects per application compared to Norway. In the 80 applications with Norwegian participation, the Norwegian coordinators are less central, have lower success rates and less experience from FET-applications and projects, but do come from rather big and reputed universities. The pattern for the partners in Norwegian consortia are much alike, albeit with scores that are generally lower.

Norway's first FET-project is from the HES sector. Nevertheless, Norway's HES sector performs weakly on all indicators (except mean number of partners), including success rate (Table A.23), as do Norwegian PRC and REC sectors (Tables A.24 and A.25).

In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.2.4 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Future and Emerging Technologies	Austria	Sweden	Finland	Denmark	Netherlands	Norway
Success rate (mean)	7,6	6,6	4,9	4,5	4,3	1,3
Projects (N)	18	16	7	7	18	1
Rejected (N)	219	228	137	150	399	79
Applications (N)	237	244	144	157	417	80
Funding per project by nation (*)	1,21	1,18	1,08	0,88	1,10	706,800
Participants per application (mean)	6,7	6,1	6,7	6,6	6,6	7,0
Coordinators						
Centrality (mean)	0,30	0,25	0,29	0,30	0,29	0,16
Number of applications (mean)	30,7	31,9	29,4	38,6	34,4	23,2
Number of projects (mean)	1,8	1,6	1,6	2,0	1,6	1,2
Success rate (mean)	0,06	0,05	0,05	0,05	0,04	0,03
EU funding per application (mean)	32,891	27,614	25,371	31,857	24,434	16,246
EU funding per project (mean)	317,480	262,910	257,619	323,471	250,370	197,676
Publications (mean)	2,694	2,918	2,215	3,063	3,318	3,351
MNCS (mean)	0,94	0,91	0,85	1,00	0,96	0,92
ARWU (mean)	407,3	394,0	497,6	338,1	371,4	346,4
Partners						
Centrality (mean)	0,23	0,25	0,26	0,23	0,24	0,18
Number of applications (mean)	24,2	26,2	28,0	27,3	26,3	25,0
Number of projects (mean)	1,5	1,6	1,6	1,5	1,5	1,2
Success rate (mean)	0,06	0,06	0,05	0,06	0,05	0,03
EU funding per application (mean)	27,733	28,862	22,837	28,696	25,514	15,870
EU funding per project (mean)	238,191	248,581	228,570	277,554	232,700	190,005
Publications (mean)	2,993	3,529	3,326	3,838	3,765	3,112
MNCS (mean)	0,95	0,97	0,95	1,05	1,03	0,92
ARWU (mean)	393,2	330,1	391,8	300,9	327,5	381,5

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

Main points:

- In this programme, the success rates are low in all countries, but Norway stands out with a much lower number of submitted applications.

- In general, coordinators and partners in Norwegian applications have much lower scores on the indicators compared to the other countries.

5.2.5 Health, demographic change and wellbeing

Compared to the Health programme in FP7, the drastic reduction in success rates is the first noticeable finding in Horizon 2020. Norway's reduction from 28,0 to 10,3 in the Health programme of Horizon 2020 is illustrative for the whole sample. Again, the distance from the country with the highest success rate to the lowest, is small, hence the inconclusive indicator scores are as expected. It is striking that the coordinators in the Norwegian consortia consistently score higher on the indicators than coordinators in the Austrian applications (Table 5.2.5). The scores for the partners are almost identical between the two countries. With the small differences in total success rates, the indicators have little to offer in explaining these differences. The only exception, is in explaining Norway's somewhat higher success rate compared to Finland's.

However, the mean funding per project seems to be highly associated with indicator scores. Norway have a substantially lower average funding per project than Denmark, Sweden and Netherlands – in particular compared to the Dutch projects. Norway's indicator scores are much lower compared to

these three countries' scores. The only country in the sample which receives less funding per project compared to Norway is Finland, whose indicator scores are much lower than Norway's.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.2.5 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Health, demographic change and wellbeing	Austria	Denmark	Norway	Netherlands	Sweden	Finland
Success rate (mean)	11,8	10,3	**10,3**	9,6	9,6	8,9
Projects (N)	50	48	**26**	125	60	38
Rejected (N)	372	419	**227**	1171	568	389
Applications (N)	422	467	**253**	1296	628	427
Funding per project by nation (*)	0,90	0,64	**501,049**	0,44	0,69	1,18
Participants per application (mean)	11,8	10,6	**11,7**	9,6	9,7	10,2
Coordinators						
Centrality (mean)	0,16	0,20	**0,19**	0,22	0,23	0,18
Number of applications (mean)	42,5	47,6	**50,3**	56,4	55,3	47,1
Number of projects (mean)	4,5	5,3	**5,2**	6,0	6,2	5,0
Success rate (mean)	0,09	0,11	**0,09**	0,10	0,09	0,09
EU funding per application (mean)	54,418	83,113	**62,673**	64,685	55,019	57,835
EU funding per project (mean)	404,352	445,692	**440,791**	454,009	413,240	382,831
Publications (mean)	3,449	4,124	**3,824**	4,146	4,032	3,365
MNCS (mean)	0,96	1,02	**1,00**	1,04	1,00	0,94
ARWU (mean)	378,5	298,9	**328,4**	308,0	300,2	378,1
Partners						
Centrality (mean)	0,12	0,13	**0,12**	0,13	0,14	0,12
Number of applications (mean)	27,7	30,1	**28,2**	31,9	32,8	28,5
Number of projects (mean)	3,0	3,4	**3,1**	3,5	3,7	3,1
Success rate (mean)	0,12	0,12	**0,13**	0,12	0,12	0,11
EU funding per application (mean)	49,175	47,755	**47,568**	48,630	47,244	42,841
EU funding per project (mean)	266,550	277,356	**262,502**	290,937	282,314	255,227
Publications (mean)	3,274	3,966	**3,557**	3,781	3,846	3,505
MNCS (mean)	0,93	0,98	**0,93**	0,98	0,96	0,93
ARWU (mean)	389,9	337,7	**366,8**	346,0	341,5	375,6

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

The *Research and Innovation action* success rates of Norwegian consortia are highly unevenly distributed in Horizon 2020. Norway's HES sector has the highest success rate among the countries in this study (Table A.29), but the distance between Norway's (highest) and Netherlands's (second lowest) success rate is just 1,36 percentage points. On most indicators, Norway scores lower than every other country, with Finland being an exception – having the lowest success rate and scores lower than Norway on almost all indicators.

Norway's PRC (Table A.30) and REC sector (Table A.31), have the lowest success rates, which is reflected in lower scores in general for both coordinators and partners in both sectors. However, it is surprising that Norway's REC sector combines having the lowest success rate among the REC sectors, while at the same time having coordinators that consistently score better than those of Austria, who has the highest success rate.

Main points:

- Success rates differ little between the countries, but Norway has received substantially lower funding per project compared to Denmark, Netherlands and Sweden.

- For these three countries, coordinators and partners' indicator scores are systematically better compared to Norway. Norway's success rate and funding per project are systematically higher than in Finland, which is the only country with lower funding per project than Norway.

5.2.6   Industrial Leadership

Industrial Leadership is a small category here, as *Space* and *ICT* are treated as separate programmes in our analyses. Norway's success rate is the highest with Austria and Netherlands (Table 5.2.6), and five percentage points higher than Denmark's success rate. Norway also have the highest average funding per project.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.2.6 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Industrial Leadership	Austria	Norway	Netherlands	Finland	Sweden	Denmark
Success rate (mean)	15,1	**15,0**	14,9	13,9	13,8	10,0
Projects (N)	45	**20**	69	34	30	21
Rejected (N)	254	**113**	394	211	188	188
Applications (N)	299	**133**	463	245	218	209
Funding per project by nation (*)	1,24	**1,049,707**	1,23	1,73	1,27	1,72
Participants per application (mean)	11,8	**13,2**	11,3	11,4	11,3	10,9
Coordinators						
Centrality (mean)	0,14	**0,11**	0,11	0,12	0,11	0,09
Number of applications (mean)	51,7	**38,4**	40,1	47,5	39,8	35,6
Number of projects (mean)	6,8	**5,2**	5,5	6,2	5,0	4,3
Success rate (mean)	0,15	**0,12**	0,15	0,12	0,12	0,13
EU funding per application (mean)	99,407	**82,692**	105,817	59,962	82,130	77,466
EU funding per project (mean)	390,891	**465,921**	380,603	365,048	399,324	358,888
Publications (mean)	2,344	**2,744**	2,979	1,887	2,979	3,228
MNCS (mean)	0,88	**0,95**	0,95	0,81	0,91	1,03
ARWU (mean)	475,5	**417,2**	399,4	521,8	402,0	354,6
Partners						
Centrality (mean)	0,05	**0,05**	0,05	0,06	0,04	0,05
Number of applications (mean)	16,1	**17,5**	17,7	20,9	14,6	17,6
Number of projects (mean)	2,2	**2,4**	2,4	2,8	1,9	2,2
Success rate (mean)	0,16	**0,17**	0,16	0,14	0,16	0,12
EU funding per application (mean)	64,010	**64,117**	59,137	51,874	57,422	48,443
EU funding per project (mean)	212,880	**234,494**	212,403	216,211	217,085	206,278
Publications (mean)	2,391	**2,738**	2,777	2,260	2,477	2,935
MNCS (mean)	0,86	**0,89**	0,91	0,84	0,85	0,91
ARWU (mean)	479,4	**442,3**	442,0	499,5	471,8	423,5

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

The Norwegian applications also have the highest number of participants. Compared to Denmark, Norway performs better on the general consortia characteristics, whereas Denmark scores better on the three university indicators.

Norway's HES sector is weakly present in this programme with just 22 applications for *Research and Innovation action,* has low success rate and generally lower scores than other countries, except Austria whose success rate here is lower than Norway's (Table A.32). Norway's PRC applications have the highest success rate among the PRC sectors (16 per cent), and in general better scores among the indicators, but at the same time lower scores among the partners (Table A.33). The Norwegian REC sector has a success rate in line with what we see in Finland, Netherlands and Denmark, but an almost 10 percentage points lower ratio than Austria, whose coordinators score much higher on most indicators relative to Norway. The results are inconclusive for the consortia partners (Table A.35). *Innovation action* applications from the REC sector places Norway's success rate second after Netherlands, and far above Finland, Denmark and Austria (Table A.36), with coordinators in the Norwegian applications generally scoring higher than both Netherlands and Denmark. In the PRC sector's *Innovation action* projects, Norway's success rate of 13,6 per cent is eight percentage points below Sweden, but Norway still scores better on almost every indicator, and at the other end of the scale, Netherlands, whose success rate is 4,4 percentage points below Norway's, scores better on most indicators for the coordinators, whereas the Norwegian partners have relative higher scores.

Main points:

- In this bulk of programmes, Norway's success rate is at the top, and the funding per project is consistently higher than in all other countries.

- We are not able to explain differences between countries' success rates or funding levels with the consortia indicators.

5.2.7   Industrial Leadership – ICT

At the early stages of Horizon 2020, Norway's success rate in the *ICT programme* of the Industrial Leadership pillar is highly improved compared to the ICT programme in FP7. Norway's success rate has increased from 14,8 to 16,3 per cent, while all other countries have seen their success rates gone down. Also, while Norway was bottom in FP7, this is completely reversed in Horizon 2020. Interestingly, Norway's indicator scores are not as good in Horizon 2020 as they were in FP7, but such reduction in scores is observed in all countries. Whilst the other countries have had coordinators and partners generally involved in more applications and projects compared to Norway, the Norwegian consortia contain collaborators with higher success, i.e. fewer applications, but with larger success rates. There is also a tendency that the other countries' consortia have more reputed universities.

In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.2.7 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Industrial Leadership - ICT	Norway	Austria	Netherlands	Sweden	Finland	Denmark
Success rate (mean)	16,3	14,0	13,8	13,5	12,7	12,2
Projects (N)	36	76	124	62	53	33
Rejected (N)	185	467	775	397	364	237
Applications (N)	221	543	899	459	417	270
Funding per project by nation (*)	657,937	1,03	0,79	0,87	1,04	0,90
Participants per application (mean)	10,4	10,4	10,0	9,9	11,3	10,6
Coordinators						
Centrality (mean)	0,09	0,11	0,11	0,08	0,12	0,10
Number of applications (mean)	36,8	49,3	48,1	36,1	48,7	45,7
Number of projects (mean)	5,9	7,6	7,3	5,7	7,6	7,1
Success rate (mean)	0,16	0,14	0,14	0,15	0,13	0,13
EU funding per application (mean)	86,253	87,627	81,640	78,680	72,153	73,739
EU funding per project (mean)	393,559	376,398	395,824	385,997	354,516	379,044
Publications (mean)	2,157	2,191	2,671	2,303	2,091	2,303
MNCS (mean)	0,85	0,84	0,92	0,85	0,85	0,89
ARWU (mean)	488,1	491,0	436,2	478,7	502,5	449,8
Partners						
Centrality (mean)	0,06	0,06	0,06	0,05	0,07	0,06
Number of applications (mean)	24,8	25,4	25,9	23,8	28,4	25,8
Number of projects (mean)	3,9	3,9	4,0	3,7	4,4	3,8
Success rate (mean)	0,16	0,15	0,15	0,14	0,15	0,14
EU funding per application (mean)	55,678	60,235	59,256	55,354	56,856	53,611
EU funding per project (mean)	240,257	255,333	253,857	254,079	250,758	251,441
Publications (mean)	2,363	2,224	2,724	2,610	2,223	2,494
MNCS (mean)	0,80	0,83	0,89	0,86	0,81	0,85
ARWU (mean)	483,3	494,7	447,8	446,6	505,9	475,3

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

Norway's level of funding per project is not as high as it was in FP7. There has been some seven per cent reduction on average in the funding for each Norwegian project participant, and whilst Norway's funding level was the highest in FP7, it is now only marginally higher than in Austria and Finland, and below Netherlands, Sweden and Denmark.

In *Research and innovation action* applications, Norway's HES sector has the highest success rate in the sample, but the coordinators, and especially the partners, have generally lower scores compared to HES consortia members in other countries (Table A.37). Norway's REC sector has a success rate quite similar to Finland and Austria, whose success rates are the highest (Table A.40), but the indicator scores do not show any systematic differences between Norway and other countries. Norway's PRC sector consortia have generally lower scores than the other countries and has the lowest success rate in the sample (Table A.38).

The contribution from the Norwegian PRC consortia to *Innovation action* projects has a very high success rate (26,1 per cent) and is the highest in the sample, but this is based on a small number of applications (Table A.39). Here, all Norwegian indicator scores are higher than for Sweden, but overall the score differences are inconclusive across countries.

Main points:

- Norway's success rate is the highest, but the funding per project is lower than in Netherlands, Sweden and Denmark (and only marginally higher than in Austria and Finland).

- We are not able to explain differences between countries' success rates or funding levels with the consortia indicators.

5.2.8 Industrial Leadership – Space

Similar to the Space programme of FP7, Norway has the highest success rate in our sample in the *Space* programme of Horizon 2020 (Table 5.2.8), but we must again note that the number of projects and applications so far is low. Compared to FP7, the indicator scores observed here show a rather identical pattern regarding Norway's strengths and weaknesses on the indicators. Among both coordinators and partners, Norway seem to have collaborators who participates in fewer applications, but do so more successfully. Again, Norway has the highest mean number of participants per application, about 70 per cent higher than Sweden whose success rate is the lowest. Norway's mean funding level per project is much higher than in all countries except Sweden (thus having the lowest success rate, but with most funding per project).

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.2.8 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Industrial Leadership - Space	Norway	Denmark	Netherlands	Finland	Austria	Sweden
Success rate (mean)	25,6	20,9	17,3	15,9	15,2	14,0
Projects (N)	11	9	23	11	16	8
Rejected (N)	32	34	110	58	89	49
Applications (N)	43	43	133	69	105	57
Funding per project by nation (*)	515,111	2,08	1,39	2,57	2,08	0,68
Participants per application (mean)	11,0	9,4	8,8	9,9	8,9	6,5
Coordinators						
Centrality (mean)	0,16	0,20	0,13	0,21	0,17	0,11
Number of applications (mean)	9,6	13,4	10,7	13,1	13,6	9,1
Number of projects (mean)	2,2	3,2	2,5	2,6	3,2	1,7
Success rate (mean)	0,24	0,21	0,20	0,18	0,21	0,16
EU funding per application (mean)	111,092	78,394	70,124	74,153	72,484	44,642
EU funding per project (mean)	271,420	238,479	209,440	230,119	207,621	142,686
Publications (mean)	3,059	3,290	3,889	2,465	3,007	4,177
MNCS (mean)	0,92	0,97	1,05	0,85	0,88	1,04
ARWU (mean)	356,3	359,9	274,0	457,5	423,5	240,1
Partners						
Centrality (mean)	0,18	0,19	0,13	0,17	0,09	0,08
Number of applications (mean)	7,1	8,6	8,6	8,9	7,1	6,7
Number of projects (mean)	1,8	2,1	2,0	2,0	1,5	1,4
Success rate (mean)	0,30	0,30	0,22	0,23	0,18	0,17
EU funding per application (mean)	61,782	58,249	49,411	48,050	37,020	43,340
EU funding per project (mean)	145,697	150,372	133,337	136,518	106,586	118,120
Publications (mean)	2,959	3,192	3,090	3,195	2,786	3,267
MNCS (mean)	0,95	0,98	0,94	0,95	0,89	0,98
ARWU (mean)	383,6	358,3	385,8	372,7	432,5	335,2

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

The only sector in Norway that has more than 20 applications to the *Space* programme so far, is the REC sector. The success rate is 23,8 per cent and is the highest among the four countries with more than 20 applications (Table A.41). Norway has the highest number of participants in the consortia, and both coordinators and partners have the highest scores on centrality and success rates. Austria has by far the lowest success rate (just six per cent, compared to 19 – 23 per cent in the other countries).

Main points:

- As in the Space programme of FP7, Norway's participation in this programme has been very successful. Norway has both the highest success rate and second highest funding per project. The funding has been substantially higher for Norway compared to all countries except Sweden.

- Sweden's main strength compared to Norway appear to be partners and, in particular, coordinators from very large, well-cited and reputed universities.

- Compared to FP7 where Norway by country size had a relative very high activity in the programme, this has not been so in Horizon 2020.

5.2.9   Research infrastructures

As in FP7, Norway has the highest success rate in *Research infrastructures,* and the highest number of participants where Netherlands (both in FP7 and Horizon 2020) and Austria (in Horizon 2020) in particular have lower numbers (Table 5.2.9). Norway's mean project funding is lower than in Finland, Denmark and Austria, though. Finland has the second highest success rate, with their coordinators and partners being slightly more central in the programme, but coordinators in Norwegian consortia have been more successful in that they have realized more funding per application and project that they have been involved in. Comparing Norway to Netherlands and Austria, it is clear that Norwegian coordinators always have higher indicator scores. This is also the case for the partners, but there are some exceptions on the university indicators.

Norway's HES sector has the second highest success rate under *Research and Innovation action* (37,9 per cent) with Finland some 8,7 percentage points above Norway (Table A.53). In the HES sector the Finnish consortia have equal or better scores than Norway on all indicators, except for Norwegian coordinators' somewhat higher scores on the university indicators. Norwegian scores are in general lower here than in the other countries, making it difficult to explain Norway's higher success rate in light of these. In the REC sector (Table A.54), Norway's success rate of 50 per cent is the highest (but only based on ten projects and twenty applications). Coordinators in Norwegian consortia score better on most indicators except the university indicators, while the partners in general have lower scores, except for the success indicators (success rate, funding per application and project), indicating that these are institutions that have participated in few applications, but yet been successful when applying.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.2.9 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Research infrastructures	Norway	Finland	Sweden	Denmark	Netherlands	Austria
Success rate (mean)	45,8	42,9	32,9	30,5	29,6	28,7
Projects (N)	27	30	26	18	55	25
Rejected (N)	32	40	53	41	131	62
Applications (N)	59	70	79	59	186	87
Funding per project by nation (*)	642,869	0,84	1,67	0,69	1,28	0,92
Participants per application (mean)	20,2	20,2	18,8	18,9	16,6	17,2
Coordinators						
Centrality (mean)	0,19	0,22	0,21	0,19	0,17	0,15
Number of applications (mean)	12,4	14,7	15,9	13,2	12,3	10,9
Number of projects (mean)	5,6	6,3	6,5	5,4	4,8	4,1
Success rate (mean)	0,38	0,34	0,33	0,32	0,31	0,29
EU funding per application (mean)	252,934	197,545	203,249	211,084	188,668	157,735
EU funding per project (mean)	475,570	460,319	458,682	495,078	416,537	386,702
Publications (mean)	4,201	3,651	4,000	3,961	3,847	3,472
MNCS (mean)	0,98	0,95	1,06	0,99	0,98	0,92
ARWU (mean)	301,0	319,7	287,8	323,8	345,6	359,7
Partners						
Centrality (mean)	0,14	0,15	0,16	0,14	0,14	0,13
Number of applications (mean)	8,4	9,3	10,1	8,7	9,0	8,7
Number of projects (mean)	3,6	4,0	4,2	3,5	3,6	3,6
Success rate (mean)	0,43	0,42	0,38	0,37	0,36	0,36
EU funding per application (mean)	133,422	136,025	130,451	123,910	121,242	121,430
EU funding per project (mean)	260,836	279,628	281,200	259,961	259,790	257,978
Publications (mean)	3,252	3,180	3,540	3,340	3,336	3,354
MNCS (mean)	0,92	0,93	0,95	0,95	0,93	0,94
ARWU (mean)	373,3	389,3	351,1	372,1	374,7	368,3

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

Main points:

- As in FP7 Norway has the highest success rate in the programme, but lower funding per project than Denmark, Finland and Austria.

- We are not able to explain differences between success rates and funding levels in the countries based on our indicators.

5.2.10 Science with and for Society

In the programme *Science with and for Society,* Norway is joint second with Denmark, with Austria having the highest success rate (Table 5.2.10). At this early stage of Horizon 2020, no Norwegian sectors have been involved in more than twenty applications, so the results for different sectors will not be commented here. Norway's average project funding is lower than in Austria and Denmark, similar as the success rate was, but also lower than Netherlands even though Norway's success rate is higher.

In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.2.10 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Science with and for Society	Austria	Denmark	Norway	Netherlands	Finland	Sweden
Success rate (mean)	24,2	17,6	17,2	13,3	12,1	11,1
Projects (N)	16	6	5	11	4	4
Rejected (N)	50	28	24	72	29	32
Applications (N)	66	34	29	83	33	36
Funding per project by nation (*)	0,72	0,71	180,717	0,68	1,19	1,11
Participants per application (mean)	11,6	11,4	11,4	10,7	11,1	9,9
Coordinators						
Centrality (mean)	0,12	0,12	0,13	0,10	0,13	0,12
Number of applications (mean)	2,8	3,0	3,2	2,8	3,1	3,3
Number of projects (mean)	0,7	0,5	0,6	0,5	0,6	0,6
Success rate (mean)	0,22	0,18	0,15	0,13	0,17	0,14
EU funding per application (mean)	88,391	53,430	50,443	46,295	43,133	33,477
EU funding per project (mean)	181,016	132,609	151,479	105,843	97,461	67,609
Publications (mean)	1,595	2,868	2,858	3,072	2,788	2,669
MNCS (mean)	0,69	0,86	0,86	0,90	0,87	0,88
ARWU (mean)	586,6	378,6	425,7	414,2	421,2	423,7
Partners						
Centrality (mean)	0,15	0,17	0,18	0,12	0,13	0,08
Number of applications (mean)	2,5	2,6	2,7	2,5	2,8	2,6
Number of projects (mean)	0,6	0,6	0,6	0,5	0,5	0,4
Success rate (mean)	0,27	0,27	0,26	0,19	0,17	0,13
EU funding per application (mean)	38,247	33,220	34,831	28,033	25,064	19,806
EU funding per project (mean)	72,393	65,146	77,777	59,352	55,745	45,813
Publications (mean)	2,249	2,608	2,581	2,666	2,213	2,023
MNCS (mean)	0,75	0,83	0,79	0,81	0,75	0,73
ARWU (mean)	521,8	473,1	485,2	472,7	527,3	529,5

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

The number of participants in the consortia do not differ much between the countries, but they still almost perfectly follow the success rate ranking. The low mean number of applications and projects in the table indicates that the data is too limited for any meaningful comparisons to be made between the countries' consortia.

Main points:

- Norway's success rate in the programme is joint second with Denmark, whereas the funding per project has been much lower than in Austria, Denmark and Netherlands.

- The data material is too limited for any (potential) systematic differences in consortia scores between the countries to be seen.

5.2.11 Secure societies - Protecting freedom and security of Europe and its citizens

As in the *Security* programme of FP7, Norway has the highest success rate in the Horizon 2020 programme *Secure societies - Protecting freedom and security of Europe and its citizens* (Table 5.2.11). The mean funding per project is also second highest in Norway. But as in many other programmes, the country with the lowest success rate has also been the most successful one in generating high average funding per project. In this case, Finland.

The mean number of participants has gone up from 12,6 in FP7 to 14 in the Norwegian consortia. It appears that Norway's main strength relative to the five other countries in Horizon 2020 is the indicators that are not specifically directed at the universities among the consortia partners. In addition, some of the coordinators in Norwegian projects have been involved in big budget projects, making the mean funding per application and project among coordinators much higher in the Norwegian consortia compared to the others. This was not so in FP7.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.2.11 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Secure societies - Protecting freedom and security of Europe and its citizens	Norway	Denmark	Sweden	Netherlands	Austria	Finland
Success rate (mean)	15,9	14,3	12,9	11,6	11,2	9,4
Projects (N)	10	7	9	18	13	6
Rejected (N)	53	42	61	137	103	58
Applications (N)	63	49	70	155	116	64
Funding per project by nation (*)	794,528	2,40	1,12	1,40	1,57	0,71
Participants per application (mean)	14,0	13,0	12,4	13,4	12,7	13,0
Coordinators						
Centrality (mean)	0,09	0,04	0,07	0,11	0,10	0,06
Number of applications (mean)	8,9	3,9	6,5	10,3	9,6	7,2
Number of projects (mean)	1,3	0,5	1,0	1,5	1,3	0,9
Success rate (mean)	0,14	0,14	0,16	0,12	0,09	0,08
EU funding per application (mean)	103,128	72,090	72,857	65,153	51,950	43,767
EU funding per project (mean)	379,017	181,103	215,936	287,718	214,517	209,352
Publications (mean)	2,279	1,661	2,834	2,752	2,134	1,852
MNCS (mean)	0,82	0,76	0,91	0,88	0,77	0,84
ARWU (mean)	517,9	556,4	461,0	471,7	531,9	513,4
Partners						
Centrality (mean)	0,07	0,05	0,04	0,05	0,06	0,05
Number of applications (mean)	5,9	4,6	4,1	5,3	5,3	5,2
Number of projects (mean)	0,8	0,6	0,5	0,7	0,7	0,7
Success rate (mean)	0,15	0,14	0,12	0,12	0,12	0,12
EU funding per application (mean)	56,041	43,457	42,418	37,825	37,300	41,132
EU funding per project (mean)	166,116	118,456	112,207	122,979	112,927	139,821
Publications (mean)	2,155	2,261	2,160	2,473	2,315	1,795
MNCS (mean)	0,78	0,79	0,80	0,83	0,80	0,72
ARWU (mean)	518,8	515,6	500,8	480,2	499,8	567,6

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

It is the REC sector that has the highest number of applications to Norway's contribution to *Secure societies*. The success rate for REC consortia (Table A.58) is completely identical though to that of the PRC sector (Table A.57) – both 14,3 per cent. Mean number of participants is 14 in the REC consortia and 10,5 in the PRC consortia. Both sectors share two features: in general, higher scores on the university indicators, but also lower scores on centrality. The differences in indicator scores are generally inconclusive.

Main points:

- Norway has the highest success rate and (except for Finland) the highest funding per project in the programme.

- Overall, coordinators and partners in Norwegian applications have had high activity, success and funding level in this programme. University coordinators and partners in the other countries' applications are, however, mostly from larger and more reputed universities compared to applications where Norway participates.

5.2.12   Secure, clean and efficient energy

The success rates in *Secure, clean and efficient energy* follows a '1-4-1' pattern: Austria with the highest success rate, a group of four countries (including Norway) with very similar success rates, and Finland with the lowest (Table 5.2.12). Compared to the Energy programme in FP7, Norway's position is stable: 2,7 percentage points behind the highest success rate in Horizon 2020 compared to 1,3 percentage points behind in FP7. There has been a shift in Norway's strongholds between the two FPs. The centrality scores were higher in FP7, but in Horizon 2020 average funding levels of collaborators have increased. The latter finding, however, has not led to more funding to Norwegian project participants. In fact, the average level of funding has gone down with 30 per cent.

In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

In the *Research and Innovation action* applications, Norway's HES consortia perform extremely poor (success rate is 3,6 per cent), with coordinators having lower scores on almost all indicators (except when comparing with Finland). The partners' scores are also lower (or equal) to most other countries (again except Finland) (Table A.59). This is completely different for the PRC sector (Table A.60), where the success rate is 18,5 per cent and the highest in the sample. The PRC sector's partners, and coordinators in particular, have higher scores in the Norwegian consortia compared to other countries. In REC sector consortia. Norway's success rate is 15,6 per cent and the highest in the sample (but just one percentage point above Netherlands). The indicator scores vary unsystematically between Norway and Netherlands, whereas compared to Finland and Austria, Norwegian scores are to some degree higher.

Table 5.2.12 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Secure, clean and efficient energy	Austria	Sweden	Denmark	**Norway**	Netherlands	Finland
Success rate (mean)	19,7	17,7	17,0	**17,0**	16,6	14,9
Projects (N)	60	37	40	**25**	69	26
Rejected (N)	244	172	195	**122**	346	149
Applications (N)	304	209	235	**147**	415	175
Funding per project by nation (*)	1,70	0,96	0,89	**1,131,363**	1,05	1,09
Participants per application (mean)	12,1	11,3	11,0	**11,7**	10,7	12,0
Coordinators						
Centrality (mean)	0,13	0,12	0,16	**0,11**	0,15	0,13
Number of applications (mean)	15,8	14,6	18,0	**14,5**	17,3	16,6
Number of projects (mean)	2,6	2,3	3,0	**2,2**	2,9	2,6
Success rate (mean)	0,19	0,18	0,15	**0,19**	0,17	0,15
EU funding per application (mean)	121,185	196,729	145,740	**166,788**	164,726	114,386
EU funding per project (mean)	346,004	436,773	438,695	**450,860**	445,203	355,965
Publications (mean)	2,442	2,616	2,316	**2,784**	3,145	1,815
MNCS (mean)	0,88	0,91	0,98	**0,95**	0,99	0,75
ARWU (mean)	478,4	425,2	445,6	**407,5**	403,8	569,1
Partners						
Centrality (mean)	0,09	0,08	0,10	**0,11**	0,09	0,09
Number of applications (mean)	8,8	7,6	9,7	**11,1**	9,6	9,6
Number of projects (mean)	1,6	1,4	1,7	**1,9**	1,7	1,6
Success rate (mean)	0,20	0,20	0,20	**0,21**	0,19	0,17
EU funding per application (mean)	83,047	91,004	91,728	**121,820**	88,363	78,514
EU funding per project (mean)	220,342	233,775	245,061	**304,831**	248,956	219,981
Publications (mean)	2,112	2,687	2,468	**2,776**	2,848	2,447
MNCS (mean)	0,81	0,87	0,87	**0,88**	0,90	0,82
ARWU (mean)	515,8	443,1	471,3	**449,7**	438,3	501,7

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

In *Innovation action* consortia, Norway's success rate for PRC consortia is rather similar to Denmark, Sweden and Finland, and much higher than in Netherlands and Austria. Norway's coordinators score lower than in all other countries, while the partners score better (Table A.61).

Main points:

- Norway has performed very similar to the other countries in this programme, both in terms of success rate and funding per project. The only exception is the Austrian project participants who have generated 70 per cent more funding per project compared to Norwegian participants.

- Norway's partners are statistically the best among the six countries, but coordinators in Norway's projects are less active and central. i.e. they have participated in fewer applications and projects, and have had fewer project collaboration partners.

5.2.13 Smart, green and integrated transport

Compared to FP7's *Transport* programme, Norway has begun Horizon 2020's programme *Smart, green and integrated transport* really well. As the only country studied here Norway's success rate has gone up from FP7 to Horizon 2020, now being 30,6 per cent. Norway's mean project funding is also substantially improved, only below that of Denmark.

Norway and Austria stand out with much higher number of participants in their consortia (Table 5.2.13). Norwegian coordinators and partners have higher success rates and funding results than in other countries in our sample. The coordinators in Norwegian applications, however, score lower than coordinators in other countries on the university related indicators.

> In the table below we compare Norway's results with five countries. The countries are ranked by their success rate in the programme. We show the mean values for all coordinators and partners that have contributed in each country's applications (regardless of their nationality). The aim of the table is to study whether high (or low) success rates are associated with high (or low) scores among coordinators and partners. Please see *reading instruction* on page 55-56 for more detailed information.

Table 5.2.13 Consortia characteristics for coordinators and partners in applications from six countries (Green value = higher score for Norway, red value = lower score for Norway)

Smart, green and integrated transport	Norway	Austria	Netherlands	Sweden	Denmark	Finland
Success rate (mean)	**30,6**	28,8	25,7	24,8	22,0	21,7
Projects (N)	**15**	34	58	29	13	10
Rejected (N)	**34**	84	168	88	46	36
Applications (N)	**49**	118	226	117	59	46
Funding per project by nation (*)	**895,256**	1,18	1,13	1,02	0,60	1,39
Participants per application (mean)	**16,9**	15,1	11,0	12,9	12,0	12,2
Coordinators						
Centrality (mean)	**0,14**	0,16	0,15	0,16	0,09	0,17
Number of applications (mean)	**10,3**	12,8	17,0	11,1	7,2	14,4
Number of projects (mean)	**2,8**	3,5	4,4	3,1	1,5	3,7
Success rate (mean)	**0,32**	0,27	0,26	0,26	0,20	0,23
EU funding per application (mean)	**279,401**	158,780	160,470	139,202	169,091	148,000
EU funding per project (mean)	**459,369**	348,336	402,630	327,556	339,236	412,732
Publications (mean)	**1,908**	2,695	3,427	2,845	3,046	2,256
MNCS (mean)	**0,82**	0,85	1,01	0,94	0,95	0,83
ARWU (mean)	**528,4**	457,1	334,4	387,3	414,9	528,6
Partners						
Centrality (mean)	**0,09**	0,11	0,10	0,11	0,09	0,11
Number of applications (mean)	**5,5**	6,8	7,9	6,4	5,4	6,0
Number of projects (mean)	**1,6**	2,0	2,2	1,9	1,5	1,8
Success rate (mean)	**0,38**	0,31	0,29	0,32	0,35	0,38
EU funding per application (mean)	**170,659**	136,571	104,738	137,135	166,673	127,520
EU funding per project (mean)	**263,619**	255,124	220,261	257,872	266,873	232,063
Publications (mean)	**2,673**	2,471	2,809	2,586	2,717	2,169
MNCS (mean)	**0,89**	0,85	0,89	0,86	0,89	0,80
ARWU (mean)	**448,3**	467,4	436,6	457,1	436,9	510,0

(*) Norway's value in raw numbers. For other countries: Norway's ratio of their values.

It is especially the Norwegian PRC consortia that have been successful, with 40 per cent success rate, and with much higher number of partners than PRC consortia in other countries (Table A.67). Compared to Denmark and Sweden, Norwegian coordinators have much higher indicator scores. The comparison between Norwegian coordinators and those in Austrian and Dutch projects show much

more mixed results. The partners' scores do not unveil any systematic difference between the countries.

The Norwegian REC sector's consortia have 26,1 per cent success rate, which is behind Austria and Netherlands who both have much higher scores on almost all indicators (Table A.68).

Main points:

- Norway has the highest success rate and the second highest funding per project among the six countries.

- The main difference between Norwegian consortia and those of the other countries is that coordinators and partners in applications where Norway participates have been less involved in the programme, i.e. fewer applications, projects and different project collaborators.

5.3   How much do the indicators explain?

A simple method to find out how much the indicators explain of the differences in success rates between Norway and the five countries that we studied in the previous chapters, is to look at how often the indicator values correspond to the rank order in success rates. That is, if Norway has the highest success rate, we would expect all other countries to have lower values on the indicator scores. If Norway has the lowest success rate, we would expect all indicator scores to show lower values for Norway compared to the other countries. Then, if Norway is ranked somewhere in the middle by its success rate, say two countries have higher success rates and three countries have lower success rates, then we would expect that the indicator values would be lower for Norway compared to the two countries with higher success rate, and vice versa for the countries with lower success rates. The percentage of how many of the 'cells' in the tables where the other countries' indicator scores correspond to their success rates (i.e. higher or lower than Norway) is a very simple measure of the consortia indicators' ability to predict success rates. Despite some methodological problems mentioned in the next section, it may give us a vague, yet illustrative picture of whether or not the indicators can explain some of Norway's success rates relative to Sweden, Denmark, Finland, Austria and Netherlands.

It is a problem that we only look at the rank order of success rates – not at the indicator values themselves. In some cases, Norway is just some 0,2 percentage points behind or above another country's success rates, and a slightly higher score on an indicator would then here be classified as a correctly predicted value, similar to an example where Norway's success rate relative to another country is some plus/minus 20 percentage points, with the true values of an indicator perhaps also being 30-40 percentage points higher or lower. In the first case, the differences are not important at all, in the second they are. Here, we do not distinguish between the two types, but just provide some very simplified measures of the indicators' prediction abilities.

If 50 per cent of the cells are correctly associated with the success rates of other countries vis a vis Norway, there is no association at all. In such cases, whether or not a country with a higher success rate has higher indicator scores are perfectly randomly distributed. If two-thirds, i.e. 66,7 per cent, of the cells have numbers in line with the success rates, i.e. 66,7 per cent of the cell values are below (or above) Norway's level when the success rate is below (or above) Norway's level, it is reasonable to say that there is a fair share of concurrence between the indicators and Norway's success rates.

In Table 5.3.1 we see that the overall pattern is that the indicators in sum do not provide solid explanations for differences between Norway and five other countries' success rates. In total, only 60 per cent of the indicator values are correctly predicted by success rates above or below Norway (or vice versa).

However, a few programmes display solid concurrence between Norway's success rates and Norway's indicator scores relative to other countries. The indicator scores systematically correspond with success rates in the FP7 programmes *Energy, Environment (including Climate Change)* and *Transport (including Aeronautics)*. In the first two, Norway's success rate is second best and best, respectively, whereas in *Transport*, Norway has the lowest success rate in our sample of six countries. The programmes in *Energy* and *Environment* clearly give us an indication that Norway's solid performance may partly be explained by strong coordinators and partnes in the consortia, whereas the opposite is so in the *Transport* programme, where it may be argued that a plausible explanation for some of Norway's lacking success is Norway's inability to invite strong partners – or to be invited into the strongest consortia.

Table 5.3.1 Percentage of Norway's success rates relative to five countries associated with indicator scores by programmes

Programme	Total	Coordinators	Partners
Activities of International Cooperation (FP7)	73,3	57,8	88,9
Climate action, environment, resource efficiency and raw materials (H2020)	96,7	95,6	97,8
Energy (FP7)	74,4	73,3	75,6
Environment (including Climate Change) (FP7)	76,7	62,2	91,1
Europe in a changing world - inclusive, innovative and reflective Societies (H2020)	76,7	75,6	77,8
Food security, sustainable agriculture and forestry, marine and maritime and inland water research (H2020)	58,9	62,2	55,6
Food, Agriculture, and Biotechnology (FP7)	50,0	51,1	48,9
Future and Emerging Technologies (H2020)	83,3	75,6	91,1
Health (FP7)	43,3	48,9	37,8
Health, demographic change and wellbeing (H2020)	46,7	46,7	46,7
Industrial Leadership (H2020)	55,6	55,6	55,6
Industrial Leadership – ICT (H2020)	47,8	51,1	44,4
Industrial Leadership – Space (H2020)	60,0	57,8	62,2
Information and Communication Technologies (FP7)	55,6	53,3	57,8
Joint Technology Initiatives (Annex IV-SP1) (FP7)	52,2	44,4	60,0
Nanosciences, Nanotechnologies, Materials and new Production Technologies (FP7)	71,1	62,2	80,0
Research Infrastructures (FP7)	51,1	66,7	35,6
Research infrastructures (H2020)	61,1	75,6	46,7
Science in Society (FP7)	51,1	64,4	37,8
Science with and for Society (H2020)	63,3	62,2	64,4
Secure societies - Protecting freedom and security of Europe and its citizens (H2020)	72,2	71,1	73,3
Secure, clean and efficient energy (H2020)	40,0	44,4	35,6
Security (FP7)	58,9	51,1	66,7
Smart, green and integrated transport (H2020)	52,2	42,2	62,2
Socio-economic sciences and Humanities (FP7)	52,8	55,6	60,0
Space (FP7)	52,2	40,0	64,4
Transport (including Aeronautics) (FP7)	74,4	75,6	73,3
Total FP7	60,2	57,6	62,7
Total Horizon 2020	62,6	62,7	62,6

In the programme for *Nanosciences, Nanotechnologies, Materials and new Production Technologies* in FP7, Norway's mid-position (measured by success rate) is partly associated with the indicator scores. Here, Norway is one the one side behind two countries who by large have better indicator scores, but on the other side Norway performs better than three countries who by large have lower indicator scores.

In Horizon 2020, the most convincing associations between the consortia indicators and success rates are found in four programmes: In *Climate action, environment, resource efficiency and raw materials,* Norway's high success rate is close to one hundred per cent in line with the indicator scores. That is, at every consortia indicator, partners and coordinators in applications where Norway participates perform better than partners and coordinators in other countries' consortia. Norway's high success rate and strong consortia in this programme is not surprising given the similar results (and success) in FP7 in the *Environment (including Climate Change)* programme.

In *Europe in a changing world - inclusive, innovative and reflective Societies*, success rates are in general modest. Nevertheless, Norway has the second highest success rate, and indicator scores vary systematically between countries. Danish consortia score better than Norwegian consortia on almost all indicators, whereas Norway's consortia generally score better than all other countries' consortia. This fits well with Denmark having the highest success rate and Norway the second highest. In *Secure societies - Protecting freedom and security of Europe and its citizens,* Norway's good success rate compared to the other five countries is clearly associated with better consortia scores, especially when comparing with Finland whose success rate has been the lowest. Contrary to these three programmes where Norway has been successful, we find the programme for *Future and Emerging Technologies* where Norway's very low success rate is clearly associated with lower consortia scores compared to the other countries.

5.3.1 Difficult to explain differences between six relative successful countries based on consortia indicators

This chapter has shown a lack of consistency in how key consortia indicators vary with two measures of European FP success: the success rates and how much funding each country has received per project they have been involved in.

Our interpretation of this is *not* that these indicators do not matter. As clearly illustrated in Chapter 4, the difference in the consortia indicator scores between funded and rejected applications are constant across all programmes, and occasionally massive in size. But when the results are broken down at country level they become less clear – especially when we study them according to differences in success rates (which may vary between 0 and 100 per cent) compared to whether an application is funded or not (which is either yes or no).

Breaking down the numbers at country level, the number of applications per country is not always very high (for statistical purposes). In all countries there are examples of institutions which do not act or succeed according to theory: high success despite inexperienced partners or partners from small universities or other research institutions. On the other hand, there are arguably many institutions who only succeed reasonably well despite taking part in consortia with partners who score well on our indiactors, such as large universities with much experience from past proposal writing and project participations.

An analysis like ours, which is only based on ECORDA data supplemented with a few quantitative university indicators, is for obvious reasons not able to take into account some very important elements of a proposal: its content, its compatability with the call, and in Horizon 2020 its ability to successfully document the impact of the project. Nevertheless, applications that get funding have

scored above threshold on *excellence*, *impact* and *quality and efficiency of the implementation*, so that we know that projects that have been funded have good scores on these three elements.

The countries that we have studied here are rather similar in many ways: all perform well in the EU FPs, they are culturally, economically and geographically not to distant from each other, and they share many of the same partners. Yet, we have clearly seen that their results differ very much in some programmes. We have frequently used the term 'inconclusive' about our results, as it is easy to spot country differences in success, but not always to back up such differences by differences in consortia indicator scores.

For Norway's case, we have seen examples of programmes where Norway has a very high success rate, but with low funding per project – and vice versa. The ICT programmes of FP7 and Horizon 2020 are two very good examples of this. In other programmes, we have seen that Norway performs very well on the success measures, but at the same time are involved in consortia where both coordinators and partners score relative low on the indicators. This may seem paradoxically, and it is so, but it must be kept in mind that we are comparing Norway to five countries that were not randomly chosen at all, and are all performing well in the FPs. Had we compared Norway to other European countries with less success in the FPs (or with countries from outside Europe), it is reasonable to suggest that these countries' lower success rates and funding results compared to Norway, would have been accompanied by lower consortia indicator scores, which would have enabled us to claim that Norway's good results in the FPs could be explained by having better partners, i.e. better consortia indicator scores.

Across both FP7 and Horizon 2020, some programmes/themes stand out with more stringent findings and explanations. Most of all, in the environment and climate programmes, but also in the energy programme of FP7 and in some of the more social sciences related programmes of Horizon 2020 (*Europe in a changing world - inclusive, innovative and reflective Societies* and *Secure societies - Protecting freedom and security of Europe and its citizens*). Here, Norway performs well and our consortia are clearly stronger than other countries' consortia. We find the oppositve in the transport programme of FP7, and in the programme for *Future and Emerging Technologies (FET)* in Horizon 2020. Here, the success is modest/low and consortia scores are far better in other countries. It is important to keep in mind that all countries are struggling in the FET programmes as success rates are very low, and updated results for Norway in this programme may be very different, as our data is from November 2015. As for transport, it is also important to note that Norway's success rate in the programme *Smart, green and integrated transport* has been the highest so far in Horizon 2020.

A third group of programmes, contains all those programmes where it is extremely difficult to draw any conclusions at all from the consortia indicators. In the health programmes of both FP7 and Horizon 2020, we are not able to detect any distinct patterns at all separating the countries with regards to consortia characteristics. One, of many, possible reasons for this may simply be the fact that the success rates of the countries vary very little. In FP7 the success rates were between 26,4 and 28,9 per cent, whereas in Horizon 2020 it has so far been between 8,9 and 11,8 per cent.

6   Successful consortia

After studying the consortia from a sector perspective in Chapter 5 in our report, which included all institutions that have been involved – successful or not – we now turn our attention towards a small sample of institutions that have been highly successful in European research collaboration. The aim of this chapter is to study whether successful consortia in EU FPs perform especially well on our consortia indicators, and to find out more about whether their consortia are characterized by long-term partnerships with a core of partners. The 'successful consortia' were chosen based on whether they have had a very high success rate (SR) in a programme and/or whether they are beneficiaries of high levels of funding per project (FPP). Due to restrictions in the use of the application data of ECORDA, we cannot show numbers for applications and success rates at institutional level. Further sample refinements are described in chapter 2.4 of the report.

6.1   Institutions with high success rates

Table 6.1 lists 56 institutions that have been highly successful in a Horizon 2020 programme. The consortia indicators (centrality, EU finding per application, etc.) are here listed as ratios, comparing the scores of these institutions' consortia participants, with the mean values for all consortia in the same programmes. Ratios above 1.00 (marked in green) means that the institution's consortia scores are higher than in the whole population, ratios below 1.00 (marked in red) means lower scores.

The overall picture of Table 6.1 is strikingly clear. The successful institutions are involved in consortia where the consortia members have much higher scores on all consortia indicators, including a much higher number of partners compared to normal or less successful consortia. The only programme where the results are somewhat ambiguous is in the *Industrial Leadership – ICT* programme. Here:

- Norway's successful institutions have achieved their good results, even with a lower number of partners in their consortia compared to all other consortia in the programme.

- Norway's successful institutions from the PRC sector (Telenor and Simula Research Laboratory) have formed consortia with partners that have been less central in the ICT programme.

- The technically oriented Aalto University and Graz University of Technology have been successful without having partners from big universities or universities with a high ranking in the Shanghai-ranking.

- Many of the REC and PRC institutions have mainly worked with smaller and not so reputed universities.

6.2 Consortia composition – ten cases

In this section we will look into the consortia compositions from some of the institutions in Table 6.1. We have randomly chosen ten institutions where we try to identify whether the consortia that the institution is involved in have a core of partners that may be important in explaining the good results. These ten examples should be considered as case studies, and are probably not representative for all 56 institutions in Table 6.1, neither do we try to establish any causality between consortia compositions and success rates/high funding.

Delft University of Technology (Netherlands): High success rate in *Climate action, environment, resource efficiency and raw materials*

In Delft's applications submitted to the Climate programme, a total of 265 institutions have been involved. Almost all of these (236 institutions) have only been involved in one application. 26 partners were involved in two applications. There are only three partners that were involved in more than three of the submitted applications (six, four and three applications respectively). Two applications that involved two of these were granted funding. For the third 'core partner' one of three joint applications also resulted in funding. None of the projects that received funding were coordinated by any of the institutions described above.

Thus, it is not clear to us whether these institutions form a core, or whether they are in fact more distant partners that are drawn into consortia with some other institutions representing the core. Looking at mutual applications in FP7's programme for Environment (Including Climate Change), there is hardly any collaboration at all between these institutions. Among Delft's 92 applications, only six include one of these institutions. We therefore conclude that Delft's high success rate in the Climate programme is not due to the presence of a well-established consortium with partners that have worked together for a long period.

Institute of Marine Research (Norway): High success rate and funding per project in *Food security, sustainable agriculture and forestry, marine and maritime and inland water research*

In Institute of Marine Research's (IMR) applications, there has been a total of 162 partners involved. 115 of these have only been involved once, 13 have participated twice, while four partners have been involved in three or more applications. These four partners mostly appear in applications with a very large number of partners. Only one of IMR's applications was without the presence of any of these. In most applications from IMR, there is a presence of 2-3 of these partners, and IMR or one of the regular partners coordinates several of them. The applications where IMR participates typically involve many big institutions (large research institutes, public agencies and universities). It thus appears that IMR has a set of core partners that they work frequently with in FP applications, and these again work frequently with each other, interacting in a large network of major, central institutions from both HES, REC and PUB sectors across Europe.

Table 6.1 Comparison of indicator scores for consortia of highly successful institutions and for all institutions. Green values = positive ratio for the highly successful institution compared to all other institutions, red values = negative ratio for the highly successful institution

Climate action, environment, resource efficiency and raw materials	Country	Sector	Criterion*	Centrality	EU funding per application	EU funding per project	Publications	MNCS	ARWU	Mean number of partners
Delft University of Technology	NL	HES	SR	3,62	1,39	2,00	1,53	1,41	2,14	1,10
Koninklijk Nederlands Meteorologisch Instituut (KNMI)	NL	REC	SR, FPP	2,97	5,23	3,37	1,53	1,34	2,05	1,73
Stichting Deltares	NL	REC	SR	3,77	2,45	1,97	1,08	10,5	1,06	1,73
Norwegian University of Science and Technology (NTNU)	NO	HES	SR, FPP	2,17	5,79	6,00	1,25	1,21	1,80	0,98
The Geological Survey of Denmark and Greenland	DK	REC	SR	1,98	1,75	1,77	1,08	1,00	1,04	1,13
Chalmers University of Technology	SE	HES	SR	3,12	1,60	1,47	0,82	1,19	1,60	1,58
Sveriges Meteorologiska och Hydrologiska Institut	SE	REC	SR, FPP	2,97	3,81	3,16	1,38	1,32	1,86	1,80
Geological Survey of Finland	FI	REC	SR, FPP	2,93	0,85	0,86	0,75	0,84	0,83	1,20
Technical Research Centre of Finland	FI	REC	SR, FPP	4,31	1,03	1,77	1,03	0,98	1,01	1,88
University of Natural Resources and Life Sciences, Vienna	AT	HES	SR, FPP	4,11	1,60	1,47	0,37	1,28	0,77	1,58
International Institute for Applied Systems Analysis (IIASA)	AT	REC	SR, FPP	3,09	1,90	2,41	1,33	1,22	1,55	1,20
Guenter Tiess	AT	PRC	SR	2,02	1,05	1,33	1,41	1,10	1,14	1,13
Europe in a changing world – inclusive, innovative and reflective Societies										
Zentrum für Soziale Innovation	AT	REC	SR, FPP	9,12	3,96	2,00	1,20	0,99	1,08	1,28
Food security, sustainable agriculture and forestry, marine and maritime and inland water research										
University of Bergen	NO	HES	SR, FPP	4,44	2,73	1,62	1,15	1,21	1,54	1,75
Institute of Marine Research	NO	REC	SR, FPP	3,20	2,74	2,16	1,09	1,13	1,15	1,67
Technical University of Denmark	DK	HES	SR	6,02	1,95	1,97	1,49	1,54	2,64	2,28
University of Copenhagen	DK	HES	SR, FPP	5,13	2,53	3,85	3,05	1,38	9,72	2,36
Aarhus University	DK	HES	SR	3,41	1,09	1,93	1,84	1,37	4,52	2,28
International Council for the Exploration of the Sea	DK	REC	SR, FPP	2,82	2,59	2,72	1,37	1,19	1,41	2,05
Natural Resources Institute Finland	FI	REC	SR, FPP	4,30	2,58	1,53	1,04	1,00	1,01	1,06
Health, demographic change and wellbeing										
Leiden University	NL	HES	SR, FPP	1,60	9,02	5,34	1,53	1,34	4,99	0,89
Erasmus University Rotterdam	NL	HES	FPP	1,40	3,23	2,67	1,70	1,31	2,04	1,23
Technical University of Denmark	DK	HES	FPP	1,35	3,29	5,01	1,10	1,36	2,09	1,12
Statens Serum Institut	DK	REC	FPP	2,11	6,81	3,58	1,40	1,17	1,42	3,24
Industrial Leadership										
Sintef	NO	REC	SR, FPP	2,54	3,66	5,75	1,03	1,02	1,07	1,21
Spinverse Oy	FI	PRC	SR	1,10	2,39	0,92	0,90	1,05	0,89	0,19
Vienna University of Technology	AT	HES	SR, FPP	2,67	2,84	2,06	0,80	1,25	1,12	1,30

Industrial Leadership - ICT	Country	Sector	Criterion*	Centrality	EU funding per application	EU funding per project	Publications	MNCS	ARWU	Mean number of partners
Academisch Ziekenhuis Groningen/University Medical Center	NL	REC	SR, FPP	0,75	5,80	1,92	0,96	0,94	0,95	0,63
Philips Medical Systems Nederland B.V.	NL	PRC	SR, FPP	2,46	3,75	2,48	0,63	0,88	0,82	4,32
Philips Electronics Nederland B.V.	NL	PRC	SR, FPP	2,43	2,47	3,60	1,08	1,05	1,06	5,69
Norwegian University of Science and Technology (NTNU)	NO	HES	SR, FPP	1,36	1,72	1,67	1,30	1,21	1,82	0,53
University of Oslo	NO	HES	SR	1,56	1,38	1,35	2,10	1,21	6,92	0,95
Simula Research Laboratory	NO	REC	SR, FPP	0,73	7,78	5,16	0,85	0,96	0,96	0,95
Sintef	NO	REC	SR	1,85	1,29	2,00	0,96	1,00	0,99	0,84
Telenor	NO	PRC	SR, FPP	0,85	0,72	0,44	0,97	0,94	0,92	1,05
Aarhus University	DK	HES	FPP	0,83	2,96	4,80	1,96	1,35	4,61	1,58
Danish Technological Institute	DK	REC	FPP	0,46	5,89	6,51	0,81	0,94	0,93	1,05
Ericsson AB	SE	PRC	SR, FPP	1,70	3,29	2,79	…	…	…	2,00
Aalto University	FI	HES	SR, FPP	2,77	1,29	2,31	0,94	1,18	0,78	1,47
Picosun Oy	FI	PRC	SR	2,31	2,37	1,14	1,12	1,12	1,21	0,95
Nokia Siemens Networks Oy	FI	PRC	SR	1,17	3,37	1,68	0,83	0,91	0,89	1,90
Graz University of Technology	AT	HES	SR, FPP	3,04	1,72	1,98	0,43	1,18	0,78	0,74
Technikon Forschungs- und Planungsgesellschaft mbH	AT	PRC	SR	1,09	2,43	1,61	1,06	1,04	1,10	0,95
AMS AG	AT	PRC	FPP	1,46	4,09	2,71	1,30	1,16	1,21	4,21
Infineon Technologies	AT	PRC	FPP	2,34	3,39	3,94	0,95	1,00	0,98	5,27
Industrial Leadership - Space										
NAMMO Raufoss AS	NO	PRC	SR, FPP	1,44	8,12	2,83	1,68	1,23	1,46	1,00
Danish Meteorological Institute	DK	REC	SR	3,27	2,39	1,94	0,89	1,02	1,02	7,40
Secure, clean and efficient energy										
Eindhoven University of Technology	NL	HES	SR	3,13	1,31	1,87	1,14	1,43	1,27	2,19
Delft University of Technology	NL	HES	FPP	4,02	1,43	3,56	1,60	1,41	2,20	3,33
Statoil	NO	PRC	SR, FPP	2,33	2,35	1,40	1,61	1,29	1,70	0,76
Smart, green and integrated transport										
Uniresearch BV	NL	PRC	SR, FPP	1,98	1,20	1,03	0,79	1,03	0,98	2,51
Stichting Nationaal Lucht- en Ruimtevaartlaboratorium	NL	REC	FPP	2,51	2,05	3,21	1,11	1,05	1,09	2,03
Chalmers University of Technology	SE	HES	SR, FPP	7,72	1,63	1,75	0,81	1,17	1,56	1,64
Volvo Technology AB	SE	PRC	SR, FPP	1,24	3,57	3,52	1,00	1,03	1,05	1,83
Kompetenzzentrum Das virtuelle Fahrzeug Forschungsgesellchaft mbH	AT	REC	SR, FPP	4,15	1,96	1,45	1,06	1,06	1,12	2,51
AVL List GmbH	AT	PRC	SR, FPP	2,67	4,61	3,90	…	…	…	1,74

*High success rate (SR), high funding level per project (FPP)

Chalmers University of Technology (Sweden): High success rate in *Climate action, environment, resource efficiency and raw materials*

Chalmers have seen four of their applications successfully being granted funding by EU in the Climate programme. Among the 140 partners that were involved in their applications to this programme, as many as 131 only participated once. One foreign partner was involved in three applications, and six institutions were involved twice. One application that led to funding, involved all the seven 'core partners'. Another funded project had participation from three of these partners.

In two applications that were rejected we find coordinators from the 'core' partners, and participation from another two of them. In total, Chalmers success rate is higher for applications where one of these institutions are involved, compared to applications where they are not involved. However, we are uncertain about whether we can speak of a formalized long-lasting consortium that Chalmers is involved in. In Chalmers applications to the FP7 programme for Environment (Climate Change), one of the 'core' partners were present in 24 per cent of the applications, and just one application involved two of them.

NAMMO Raufoss AS (Norway): High success rate and funding per project in *Industrial Leadership – Space*

The Norwegian private company NAMMO Raufoss AS has participated in three EU-funded projects in the Space programme of Horizon 2020. These three projects have been coordinated by very big, central players: Airbus Defence and Space SAS, Office National d'Etudes et de Recherches Aerospatiales and Stichting Nationaal Lucht- en Ruimtevaartlaboratorium. With few common partners in these three projects, NAMMO's key to success is their ability to be invited by, or finding themselves into applications with very strong coordinators.

Aalto University (Finland): High success rate and funding per application in *Industrial Leadership – ICT*

Aalto University has had a total of 691 partners in their applications to the ICT programme. 387 were one-time partners, 122 participated twice and 15 three times. Then follows eleven institutions with participation four times or more. None of Aalto University's funded projects are without at least one of these eleven institutions.

However, given the large number of institutions, it is difficult to identify a formalized network, as it appears quite random which partners that are involved in the applications. In Aalto University's funded projects, four projects involved one of the partners only, two projects involved three partners and one project involved five partners. Only one of the projects was coordinated by one of the most frequent partners (this project involved three of the partners). One third of Aalto's rejected applications involved one of the partners only.

The overall picture is similar in the ICT programme of FP7; rather fragmented, with several applications and projects with some of these institutions, but seldom coordinated by one of them. Thus, we can say that Aalto University has a set of partners that they collaborate more with than others, but we are not able to say whether or not they are intertwined into a formalized consortium.

Technikon Forschungs- und Planungsgesellschaft mbH (Austria): High success rate in *Industrial Leadership – ICT*

In Technikon's applications to the ICT programme of Horizon 2020, a total of 152 partners are involved, of which 88 participates once and 15 twice. The five most frequent partners have been involved either three or four times. None of the applications where any of these institutions participates have been coordinated by Technikon or themselves.

One of the 'core' partners does not participate in any applications involving any of the other partners. Amongst the other partners, there are several examples where two or three of them appear on the same application. However, Technikon's success rate cannot be explained by any kind of successfully established consortia (if any such exists), as it is just one of Technikon's five projects that involves any of the most frequent partners. Therefore, it appears that Technikon's ability to get EU funding actually increases when they apply *without* the presence of their most active collaboration partners.

Nokia Siemens Networks Oy (Finland): High success rate in *Industrial Leadership – ICT*

Nokia Siemens has participated in four EU-funded projects. 107 out of 174 partners in their applications are one-time partners, while 19 partners have contributed twice or three times. For Nokia's case, there seems to be a set of core partners: two companies appear on five of the applications, whereas a third company appears four times.

This network appears essential to Nokia. None of Nokia's funded projects are without these partners. Three of Nokia's four projects involve all of these, while the fourth and last project involve two of them. Although none of the projects have been coordinated by any of these partners, one project was coordinated by Nokia Siemens in Germany. In addition to these successful applications, Nokia in Finland and the three partners all contributed to an application that got rejected.

Philips Electronics Nederland B.V. (Netherlands): High funding per project in *Industrial Leadership – ICT*

The Dutch company Philips Electronics has had five projects in the ICT programme, with a very high amount of funding received per project. Like with every other institution we look at here, most of the application partners (366 out of 429) are one-time partners. A set of four core partners appear, with contribution in twelve, eleven and (two times) eight applications.

One or more of these four partners have been involved in several rejected applications but also in four applications that were granted funding. Thus, four out of five projects at Phillips Electronics are in concurrence with these partners. While the success rate of this consortium may not be that high, its ability to raise large levels of funding once an application is approved is more impressive.

Statens Serum Institut (Denmark): High funding per project in *Health, demographic change and wellbeing*

Statens Serum Institute has had a total of 147 partners in their applications (of which 126 have participated only once). Of the six most frequent partners, one is a special case as this partner is never a partner in applications involving any of the other most frequent partners.

In the applications from Statens Serum Institute, about one third involve three or four of these core partners, and almost all applications have the presence of at least one of them. Thus, it is reasonable to say that Statens Serum Institut has a set of core partners, that to various degree participates in the applications. These are all either large research institutes or public entities.

Simula Research Laboratory (Norway): High success rate and funding per project in *Industrial Leadership – ICT*

Among Simula Research Laboratory's 85 different partners so far in the ICT programme, only four have appeared three times or more in the applications. Only one application that featured any of these four partners was granted funding. Thus, even though a few applications involve one or two of these institutions, they can hardly be characterized as members of a successful consortium and the reason why Simula has performed so well (in FP7 only one of these four partners took part in any of Simula's applications). Therefore, Simula's success in Horizon 2020 is not due to the company's participation

with a set of frequent partners, but rather Simula's ability to find good partners from one application to the next.

6.3 Conclusions: little evidence of long-lasting consortia

The fragmented stories we have told about successful institutions' collaboration with their most active partners, tell us that it is not typical that the success of these institutions are due to long-lasting partnerships where a few institutions form a core in permanent consortia.

The most successful institutions have extremely good scores on the consortia indicators, but these are due to the composition of all partners that have been involved, regardless of how many times, and in some of the case stories we told we even saw that working with a core set of partners was actually associated with a reduced likelihood for getting project funding.

The successful institutions in Table 6.1 have two things in common. One is that they seem to select or are selected themselves by strong collaboration partners. The other is that they are mainly large and reputed institutions themselves with high scores on the indicators. When two or more such institutions form a partnership together, i.e. involve themselves in joint applications, that would in theory form a very solid partnership with good prospects for funding. There is no evidence in our analysis proving otherwise, but we are unable to see that these joint efforts appear in repeated networks with a steady core of other institutions. They seem to be more based on bilateral and infrequent collaborations.

We acknowledge that this analysis is based on a limited dataset, i.e. we have only looked at consortia that has applied in the same programmes. As we stated in chapter 2.3, the funding to e.g. ICT or health institutions may not necessarily come from the ICT or health programmes. A full-scale analysis of institutional partnership across all programmes, would most likely have identified many examples of long-lasting partnerships between a core of partners, but this has not been possible to do within the frames of this report. It is also important to keep in mind that a consortium may not necessarily be visible in ECORDA. Many of the informants we interviewed, cf. chapter 3, stressed the importance of having partners you trusted and that you have had good experiences with in the past. Such experience does not need to be related to application processes or project participation in FPs, they can be based on previous experience from other research programmes, publication collaboration, industrial collaboration and so on. It may therefore be that there are 'true' consortia present in these highly successful institutions that we are not able to see, but which could have been identified using other types of databases.

7 Conclusions

The main findings of this report are relatively intuitive, but not necessarily predictable: although quality and impact are two main aspects of a proposal when being reviewed in Brussels, we have found that the consortia characteristics do matter, and are highly associated with the probability of getting EU funding (chapter 7.1). Essentially, this can be explained by 1) consortia with good scores on the indicators actually do write better proposals than other consortia, or 2) consortia with good scores on the indicators have a stronger consortia CV, or 3) a combination of both.

Overall, these consortia characteristics do not explain much of Norway's total success in the framework programmes compared to Sweden, Denmark, Finland, Austria and the Netherlands (chapter 7.2). This is not because the indicators do not matter, but because the countries' overall abilities to get their institutions into strong consortia do not differ that much.

In addition to the consortia characteristics, we have looked at national or local support schemes and how important researchers believe these are for the prospects of getting funding from EU. In chapter 7.3 we discuss some of the most important findings regarding national support schemes, with special focus on the challenge of finding industrial partners in Horizon 2020, while chapter 7.4 discuss the need for adequate local support.

7.1 Consortia characteristics matter

It is clear that the success rates of institutions that apply for funding in the FPs are highly dependent on three factors. *First,* two factors that apply to all institutions: whether or not an institution takes part in the writing of a proposal where the group of partners has experience from former writing of proposals and from participation in FP projects.

In table 4.1, we learned that institutions that are involved in EU funded projects have much more experience from proposal writing and many more project participations – but that the most conspicuous consortia characteristic is the *success rate* of the institutions in the consortia. High success rate indicates that an institution has an effective pattern of proposal writing. It is capable of knowing when to apply and with which partners, unlike many institutions that are found in ECORDA, with a very high number of applications, but with very little success. The combination of high volume of proposals and high success rate, means that the institution is capable of creating partnerships with many institutions, thus strengthening its degree of centrality in the European research network, which is another factor that is highly correlated with good prospects for funding. The European Commission (2015b, p.112) therefore simply recommends that institutions should make efforts in increasing their

networks: "Stamina, repeated participation, and a willingness to increase one's connections are the only way forward to better one's position when on the periphery". This recommendation is rooted in both theory and past studies, and also a reasonable recommendation based on the results in our report.

Second, for universities, it is clear that universities that are big, well-reputed and whose publications are highly cited, have relative higher success rates than other universities. This finding is not necessarily straightforward. Some of the world's best universities from outside Europe, have not been very successful as partners in FP proposals. For example, a Norwegian university hospital has twice coordinated applications featuring one of the world's most prestigious and well-known American universities, but both applications were rejected. In fact, bringing in a prestigious university into a consortium only seems a proper strategy when the university is already a key player in FP research; past experience from proposal writing, many projects, high success rate and high degree of centrality.

In many ways, all these factors seem to illustrate the 'Matthew effect'. The landscape of FP partners seems fixed. The growth in FP funding over time has not been followed by a corresponding increase in the number of units that receive funding (European Commission, 2015a). Those already on the inside of the EU FP networks benefit from their institutional reputation, their know-how on how to write proposals, their networks that they can draw upon, in addition to the fact that past participation means that they have already sustained proposal-related sunk costs. From our interviews we observed huge differences in institutions regarding their administrative support capacity for FP proposals. At some of the big units, the researchers were all very pleased with the support they got from very professional, full-time EU administrators, whereas at smaller institutions the verdict was that when you entered a FP proposal you were very much on your own as the institution did not have an overall strategy for promoting FP participation and little or no administrative support was offered. These impressions are, however, only based on a very small number of informants, and we do not know whether they are representative for the whole of the institutions that we have not interviewed.

Third, the larger the number of partners in a consortium, the better the prospects for funding. This was probably the easiest finding to document in our analysis, as the proposals that have led to EU funding clearly have higher number of partners across almost all programmes and action types. It is not difficult to find projects that do not fit into this pattern (i.e. successful proposals with fewer partners), but this does not change the main results when all proposals are taken into account. However, boosting the number of partners may not be a good strategy for many reasons, and from our interviews, some respondents spoke about the need for keeping the number of partners down to a manageable number. In one example, a partner was even thrown out of a proposal in the later stages, because the consortium had simply got too big. We do not recommend that it should be a strategy to increase the number of partners for the sake of promoting one's chances of getting the proposal accepted, because presenting an unrealistic consortium with too many partners would most likely be a counterproductive strategy, as the project would appear little trustworthy, and damage the chances for funding. Nevertheless, we state that the number of partners is lower in rejected proposals.

Why it is higher in proposals that have received funding, may rely upon many things. One of them can be, that experienced and central coordinators are drawing upon their large network, and are able to identify a string of partners with unique competences where each partner's presence in the consortia may be justified due to the complexity of the project and the partners' unique skills. The main impression from the interviews we did with Norwegian coordinators, is that they did not bring anyone into the project unless they added a competence that no one else in the consortium already had.

Our study of the highly successful institutions (chapter 6) revealed that these are mostly institutions that score well on the above-mentioned indicators themselves, in addition to getting involved in consortia where the sum of partners displays very high scores on the consortia indicators that we have analysed.

The policy implication of these findings, is that the most efficient strategy to enhance Norway's return rates (and also success rates) in EU FPs, is to target the established players, already being close to the centre of the European research network. Lifting small higher education institutions, research institutes, private companies etc., up from peripheral positions, to not-so peripheral positions would not be very effective for increasing success rates and especially not for increasing the total return from Horizon 2020. The analysis in this report clearly underpins the need to concentrate the focus at those institutions that already have experience with proposal writing and project participation (**recommendation #1**). All in all, our analysis indicates that the financial return from FPs are highly dependent on large actors with persistent success and high expertise in coordinating EU-projects. Without such 'locomotives' it seems difficult to obtain a high total return from the programme. Given that the room for investing in incentives for increased participation is limited, there might be a policy trade-off between on the one hand focusing on financial return and strengthening the position of large actors and on the other hand mobilising for a broad participation with many actors involved and, as a consequence, accepting lower total financial return.

7.2 Consortia characteristics do not explain much of Norway's relative success in European Framework Programmes

Although it is clear that consortia characteristics matter, when we compare Norway to Sweden, Denmark, Finland, Austria and the Netherlands, it is difficult to point at specific indicators and say that these explain why Norwegian consortia generally score lower (thus explaining Norway's lower success) or better (thus explaining Norway's higher success) compared to these countries.

The countries that we have chosen for comparison are nations that perform well in EU FPs. While it appears to be a common perception that Norway is struggling in the FPs, this is certainly not what our analyses show. However, in this report we excluded Norway's two weakest links in the FPs: The European Research Council and Maria Sklodowska-Curie activities. Norway's FP results are far better in the collaboration programmes.

As of June 2016, Norway's total success rate in Horizon 2020 was 13,7 per cent, almost identical to Denmark (13,8 per cent), above both Sweden (13,2 per cent) and Finland (11,7 per cent), but below Austria (14,5 per cent) and Netherlands (14,2 per cent). Thus, the group of countries that we have compared in this study have had relatively similar overall success. Norway's success rate is higher than the total average among applicants in all programmes under the pillars Industrial leadership and Societal challenges (Research Council of Norway, 2016). What we effectively are studying here, are six rather successful nations in EU FPs.

The programme-specific analyses in chapter 5, displayed a fragmented picture. Norway's success varies from programme to programme, and within a programme it is possible that the 'Norwegian' consortia has a) better coordinators and b) worse partners than other countries for one sector, whereas in another sector, Norway has a) worse coordinators and b) better partners than other countries.

In all six countries there is a rather high availability of national funding, which may act as a complementary channel and provide additional resources that foster application efforts, according to Enger & Castellaci (2016, p.26). The economic crisis in Europe is arguably a very important factor in explaining the extreme growth in the number of proposals to Horizon 2020, also illustrated in Table 7.1, where we see that Greece has become one of the most frequent collaboration partners to all six countries in our sample in Horizon 2020.

One possible reason for the low explanatory power of our indicators in detecting differences in success between the six countries studied here, may be the interdependency of the same actors in the European FP networks. *First,* there are hardly any differences between the studied countries in terms of how international their consortia are. The percentage of foreign partners in each country's consortia

range from 87,3 per cent in Norway to 85,3 per cent in Sweden[5]. *Second,* many of the consortia involve partners from two or more of the six countries studied in this report. Third, there is a common set of core partner nations (Table 7.1), with Germany (9,5 – 11,4 per cent), United Kingdom (8,8 to 10,4 per cent), Italy (7,6 to 8,3 per cent), Spain (7,2 to 7,8 per cent) and France (6,5 to 7,4 per cent) being the most important partners. For all six countries, the percentage of partners from the ten most important collaborating countries, are in the range 61,6 to 64,4 per cent. Thus, the European countries studied here have so many similarities in their FP behaviours, that the numbers are somewhat forced to converge.

Table 7.1: Percentage of partners (in total) from each nation's top-10 collaborating countries.

Partner country	Austria	Denmark	Finland	Netherlands	Norway	Sweden
Germany	11,4	9,8	10,0	11,0	9,5	10,7
United Kingdom	8,8	9,7	9,3	10,4	9,4	10,1
Italy	8,2	7,6	7,8	8,3	7,6	8,2
Spain	7,4	7,3	7,8	7,7	7,2	7,5
France	6,5	6,5	6,6	7,4	6,6	7,2
Netherlands	5,5	6,3	5,7		6,0	6,1
Belgium	4,3	4,6	4,2	5,4	4,2	4,5
Sweden	3,5	4,5	4,6	4,0	4,3	
Greece	3,8	3,3	3,7	3,6	3,6	3,3
Switzerland	3,5	3,1		3,5		3,4
Austria			3,4	3,4		
Finland						3,4
Denmark					3,3	
Other countries	37,0	37,0	36,8	35,3	38,4	35,6
Total	100	100	100	100	100	100

In the thirteen programmes from Horizon 2020 that we have analysed, Norway has the highest success rate in seven of the programmes, but only the highest level of funding per project in two. Norway's "mean" success rate rank is second in this sample, while our "mean" funding per project rank is third. Netherlands is clearly the country which is able to get the most funding for each project that they are involved in, having the highest number of funding per project in five of the thirteen programmes.

Although one of the main results so far of Horizon 2020 has been that Norway's success rate has fallen, while the return rate has increased (meaning fewer projects, but with more money per project), it is still so that other countries analysed here are capable of extracting more money back to their countries in many of the programmes, either due to more national partners involved in the projects, or because they are capable of building bigger projects. It therefore seems beneficial for Norway's overall return rate in Horizon 2020 if the key players in Norwegian research would more often coordinate larger projects. *The policy implication* of this is that the Research Council should make the coordinator role more attractive for larger institutions (**recommendation #2**). This function may need financial stimulus, as it is claimed that it has become less attractive to get engaged in after EU removed the special reimbursement for coordinators. Some of our informants in the interviews mentioned that many large universities and research institutions had become less willing to take on this role, and that more projects in Horizon 2020 are now being coordinated by smaller, less experienced actors. This is a (potential) development that we recommend that the Research Council monitors in the future. Given

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[5] In the FPs studied in this report, Austria and Sweden both had partners from 174 countries, Finland from 163 countries, Norway from 161 countries, Denmark and Netherlands from 156 countries.

the empirical results in this report, we believe it is a good strategy for a country to have its largest and most merited institutions in key roles in EU FPs. They have better chances to succeed as coordinators, and statistically, there are more partners involved from a country if the coordinator is from that same country, compared to when the coordinator is not. This means that having key institutions in Norway to coordinate more applications, will most likely bring more Norwegian institutions into FP projects compared to applications and projects led by foreign institutions.

7.3 The support schemes at national level – difficulties in addressing the impact issue in Horizon 2020

The supporting schemes of RCN mostly received very good feedback from the informants the we interviewed. This has also been found in past evaluations of RCN and of Norwegian participation in EU FPs. When asking researchers from both Norway and abroad who have experience with coordinating both Framework programme proposals and projects, they stress the importance of local professional administrative support during the proposal preparation stage. The coordinators widely use and appreciate instruments targeting the project establishment phase, but with the strong emphasis on impact in Horizon 2020 more efforts from RCN in helping the consortia in finding relevant industrial partners and end-users were requested. Some of our informants claimed that RCN instruments were too oriented towards and favouring the technically oriented disciplines, so that the identification of industrial partners was better taken care of in the traditionally industry-related institutions.

Hence, thematic NCPs should strengthen their coordination and sharing of information about their networks across thematic priorities (**recommendation #3**). A further approach could be to exchange networks across funding agencies, such as between RCN and Innovation Norway (e.g. the Enterprise Europe Network). From one of our interviews we learned that the exchange of networks between research funding organisations and more user/innovation oriented agencies was done to support cooperation between actors who were not traditionally used to collaborate with each other. These 'match-making' activities were arranged before the launch of calls that specifically required 'untraditional' consortia constellations. Our analyses suggest that coordinators from technical fields have been much more successful in finding good industry partners, i.e. the struggle with coping with the impact concept seem more present in less technical fields, and the partner search thus ought to be more prioritized in these fields.

Generally, we see that coordinators build their consortia based on prior collaboration. Factors such as prior collaboration between partners, trust and interpersonal relationships are key factors determining partner choice. It is often the case that several of the partners in a consortium have had previous relations with the coordinator. While it is often the case that not all needed partners are known to the coordinator, new partners are often found through the networks of core partners. Given that trust and good personal relationships are central elements on which successful consortia are built, one may question the added value of partner search engines or other types of support measures targeting the selection of the core partners of a consortium. However, as mentioned before, our study found that help in finding partners whom can contribute to fullfilling the impact criteria of the call may be useful for certain actors.

Having to cope with the concept of immediate impact and not only industrial partners, but also end-users (public sector entities, NGOs, etc.), has been a somewhat troublesome experience for many Norwegian research actors. Although the technical universities and research institutes are more familiar with this, even well-established actors such as Sintef did struggle in the early phase of Horizon 2020. We know from the interviews that this has been the situation in e.g. Denmark and Sweden as well (and probably in the other three countries too). Comparing the inclusion of private companies in the countries' proposals could perhaps tell us whether there are any systematic differences at country level. In Table 7.2 we compare proposals that have been coordinated by the six countries in our study.

The sample consists of applications where the coordinators come from either the higher education sector (HES) or from research organisations (REC). This is based on the assumption, that it may be a challenge for these institutions to find relevant industrial partners. We look at average number of PRC partners per application that have had a coordinator from each nation's HES and REC sector respectively, in addition to three consortia characteristics: the PRCs' degree of centrality in a programme, their success rates in the same programme, and whether they are 'big players' in the programmes, i.e. their average funding per project that they have participated in. For FP7 results see Table A.78 in the appendix.

Table 7.2: Comparison of PRC partners in Horizon 2020 applications coordinated by HES and REC institutions (red value = Norway has lower scores, green value = Norway higher scores)*

Climate action, environment, resource efficiency and raw materials	Centrality	Success rate	EU funding per project	Mean number of PRC partners per application	Applications (N)
Austria	0,015	0,10	30,154	3,2	9
Finland	0,065	0,20	150,217	4,6	14
Netherlands	0,027	0,20	66,178	3,5	26
Norway	**0,004**	**0,02**	**10,567**	**4,8**	**8**
Sweden	0,017	0,15	67,049	2,2	12
Europe in a changing world - inclusive, innovative and reflective Societies					
Austria	0,035	0,07	12,397	1,5	31
Denmark	0,009	0,08	55,007	0,8	18
Finland	0,006	0,10	29,174	0,7	42
Netherlands	0,011	0,06	32,669	1,6	53
Norway	**0,009**	**0,06**	**5,200**	**0,9**	**29**
Sweden	0,005	0,01	10,681	1,6	25
Food security, sustainable agriculture and forestry, marine and maritime and inland water research					
Denmark	0,031	0,29	42,370	2,8	22
Finland	0,011	0,22	31,559	1,3	23
Netherlands	0,008	0,07	40,994	3,2	46
Norway	**0,007**	**0,08**	**40,954**	**4,5**	**11**
Sweden	0,006	0,11	33,838	3,6	13
Future and Emerging Technologies					
Austria	0,009	0,13	185,085	0,6	39
Denmark	0,004	0,10	90,729	0,6	21
Finland	0,001	0,05	22,297	0,7	32
Netherlands	0,006	0,06	43,834	1,0	66
Norway	**0,002**	**0,02**	**3,866**	**0,8**	**17**
Sweden	0,130	0,09	106,309	0,6	48
Health, demographic change and wellbeing					
Austria	0,018	0,07	105,863	2,6	54
Denmark	0,015	0,13	88,287	1,3	77
Finland	0,008	0,04	42,281	1,4	102
Netherlands	0,016	0,10	114,069	1,4	364
Norway	**0,006**	**0,14**	**91,875**	**1,5**	**29**
Sweden	0,015	0,07	56,968	1,3	128

Industrial Leadership	Centrality	Success rate	EU funding per project	Mean number of PRC partners per application	Applications (N)
Austria	0,017	0,21	156,858	5,6	19
Denmark	0,007	0,03	59,405	3,0	40
Finland	0,010	0,09	90,191	4,6	59
Netherlands	0,016	0,19	162,332	3,0	65
Norway	**0,016**	**0,21**	**177,183**	**6,1**	**25**
Sweden	0,014	0,17	100,071	4,6	40
Industrial Leadership - ICT					
Austria	0,027	0,14	215,578	4,6	47
Denmark	0,011	0,17	150,209	3,5	37
Finland	0,018	0,14	142,798	4,6	69
Netherlands	0,018	0,13	160,973	3,8	92
Norway	**0,021**	**0,14**	**191,404**	**4,9**	**38**
Sweden	0,021	0,10	134,558	3,4	37
Industrial Leadership - Space					
Finland	0,020	0,06	46,007	1,8	15
Netherlands	0,062	0,32	145,280	2,6	15
Norway	**0,063**	**0,36**	**195,948**	**2,3**	**6**
Sweden	0,010	0,16	52,235	1,3	11
Secure societies - Protecting freedom and security of Europe and its citizens					
Austria	0,025	0,12	61,359	3,9	9
Finland	0,041	0,11	77,274	3,1	14
Netherlands	0,049	0,18	116,520	4,0	17
Norway	**0,017**	**0,17**	**95,880**	**2,2**	**11**
Sweden	0,007	0,01	29,022	2,2	5
Secure, clean and efficient energy					
Austria	0,027	0,13	108,938	5,6	19
Denmark	0,019	0,12	96,916	2,9	25
Finland	0,022	0,16	179,566	2,8	40
Netherlands	0,023	0,12	206,976	2,6	54
Norway	**0,018**	**0,11**	**103,245**	**4,2**	**27**
Sweden	0,025	0,16	134,328	3,7	23

*Only cells with more than 5 applications are shown. Science with and for society, Smart, green and integrated transport and Research infrastructures are left out.

Starting with the mean number of PRC partners per project, there is no sign of Norway struggling to find partners compared to the other countries. In both the climate programme, the food programme and in the industrial leadership programmes, coordinators from Norway have the highest number of PRC partners in their proposals. In other programmes, we cannot find any examples of the Norwegian numbers of PRC being noticeable lower than in any other countries. The question then becomes; do Norwegian coordinators recruit good PRC partners? In the Climate programme, which have previously lifted as a highly successful programme for Norway with very strong consortia, it appears not. Norway has the highest number of PRC partners, but these partners have extremely low scores: very little project experience, very low success rates and very low funding per project. The programmes *Future and Emerging Technologies* and *Europe in a changing world*, are also programmes where Norway's PRC partnes have low indicator scores. In *Secure, clean and efficient energy* Norway has the second highest number of partners, but these are partners who have generally received only half the funding per project of e.g. the Dutch projects, and they have the lowest scores on both the centrality and success rate indicators.

The successful choice of PRC partners is found in *Industrial Leadership*, both *Space*, *ICT* and the rest category featuring biotechnology, advanced materials, etc. With a few exceptions, in all these programmes, Norway has the highest number of PRC partners and these partners have the highest centrality scores, the highest success rate and the highest funding in the projects that they have been involved in. These findings indicate that when Norwegian institutions are coordinating proposals, there are strong differences across programmes in how successful PRC partners they are capable of finding, with HES and REC coordinators of *Industrial Leadership* proposals finding more solid PRC partners. Given the strong emphasis on impact and involvement of industry and end-users in Horizon 2020, the policy implication of this would be that the RCN gives priority to help finding relevant industrial partners (and end-users) to Norwegian actors (**recommendation #4**), especially those with a profile that does not concur with the Industrial Leadership profile.

Our analyses could not conclude at an overall level that Norway in general has 'strong' or 'not so strong' partners in our consortia. These findings varied from programme to programme, and across the consortia indicators there was generally little consistency. Nevertheless, these indicators do matter, which was clearly demonstrated in chapter 4. The implication of this, is that it will always be a good idea to aspire for the optimal consortium composition. A large part of this task will have to be done by the institutions themselves, as much of the partnerships in EU research is based on a set of core partners who has a long history together. But these partners do recruit new partners into their consortia, and as we saw in chapter 6 where we looked at successful consortia, most of the partners that work with successful institutions are one-time partners. Being invited to take part in a proposal/project coordinated by a key player in European research is in theory the most effective way for an institution to getting closer to the core of European research actors. The policy implication of this, is that the Research Council develops targeted strategies for teaming up Norwegian institutions with the leading research institutions of Europe (**recommendation #5**). There are at least two different approaches to such a strategy: one is to help Norwegian institutions to find the best available partners outside of Norway. Most likely this needs to be done even before the calls are announced by EU, as the 'best' players most likely are rapidly invited into consortia – if they have not already invited other institutions into their own. The second strategy is for the Research Council to identify Norwegian strongholds and special areas of expertise/excellence. This means that RCN should serve as a marketing agent for Norwegian institutions in the FPs, selling Norway's comparative advantages, so that Norwegian institutions become more attractive to invite into consortia (**recommendation #6**). The attractiveness may result from e.g. unique data, proximity to study objects, infrastructure, competences and/or experience in Norway.

7.4 Participants need to be backed by a well-functioning administrative support system at their institutions

The existence of a professional administrative support during the proposal preparation stage is perceived as crucial for landing a successful proposal. A lack of a specialised support system and an unsupportive institutional environment (e.g. unengaged leadership and/or lack of a strategy for the institutions involvement in EU FPs) may result in weak participation and even contribute to the unwillingness of researchers to take up a coordinating role in the future. It was also mentioned that the existence of a well- functioning administrative support system may as well contribute to strengthen the reputation and attractiveness of the institution and therefore increase the chances of those institutions' researchers to being (re)invited into project cooperation in the future.

A smooth administrative collaboration between partner institutions during the project phase may in some cases be equally important as the scientific collaboration. From the viewpoint of experienced coordinators, it was mentioned that positive experiences from cooperating with professional administrative departments of the partner's institutions was having a high significance for renewed collaboration in future proposals. As a consequence, it could be of strategic importance for institutions

with well- functioning administrative support systems to make those functions more visible in order to increase the attractiveness of the institution as partner in EU consortia. Moreover, NCP staff of the RCN could more actively promote Norwegian insitutions, through appropriate channels in Brussels or elsewhere, for not only having excellent research environments but also for being administratively well prepared to back researchers' participation in EU consortia. Furthermore, it is important to have an institutional leadership that is engaged and proactively supports the participation in EU funded research. In order to raise awareness on the benefits of participating in EU funded research, NCP staff could invite institutions to participate in strategic dialogue meetings (e.g. "ERA dialogue meetings" used in other countries) involving the leadership (such as deans) with the objective to enhance awareness about challenges and opportunities with participating in EU funded programmes. The same type of meetings could be done with other types of participants such as industry and public sector organisations. In this regard, it is important to tailor activities to the target groups as much as possible. We recommend that RCN makes efforts in having higher education institutions, research institutions and large R&D intensive private companies administratively well-equipped in having the necessary in-house EU administrative support (**recommendation #7**).

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Appendix

Table A.1: FP7 projects, comparison of consortium characteristics in granted versus rejected applications

	Projects	Rejected	Mean number of participants per application		Centrality		Applications (N)		Projects (N)		Success rate	
			Projects	Rejected	Projects	Rejected	Projects	Rejected	Projects	Rejected	Projects	Rejected
Activities of International Cooperation												
Coordination & support action	61	106	12,4	8,4	0,24	0,06	12,8	5,0	9,4	2,4	0,77	0,16
Energy												
Total	284	902	12,3	9,8	0,17	0,11	21,1	18,1	7,5	4,8	0,58	0,15
Coordination & support action	39	64	12,3	10,6	0,15	0,10	15,9	16,3	6,2	4,5	0,63	0,16
Collaborative project	242	835	12,1	9,7	0,17	0,11	21,2	18,1	7,5	4,8	0,58	0,15
Environment (including Climate Change)												
Total	423	1490	14,9	12,1	0,17	0,11	34,2	27,6	11,1	7,0	0,49	0,16
Research for the benefit of specific groups	7	25	9,3	9,7	0,07	0,07	15,6	18,3	5,0	4,8	0,66	0,13
Coordination & support action	82	165	12,5	9,4	0,15	0,10	27,1	24,4	9,2	6,5	0,54	0,16
Collaborative project	333	1296	15,6	12,5	0,18	0,11	35,7	28,1	11,5	7,1	0,48	0,16
Food, Agriculture, and Biotechnology												
Total	458	1725	15,6	12,7	0,13	0,09	49,2	40,3	15,6	10,2	0,50	0,15
Coordination & support action	94	146	15,9	11,9	0,14	0,08	44,8	35,6	16,3	9,2	0,59	0,17
Collaborative project	361	1572	15,6	12,7	0,13	0,09	50,5	40,6	15,4	10,3	0,47	0,15
Health												
Total	790	2463	11,9	8,6	0,20	0,15	77,4	67,0	25,6	19,9	0,45	0,21
Network of Excellence	7	8	26,1	10,3	0,25	0,25	96,6	105,9	32,5	33,7	0,41	0,29
Coordination & support action	91	158	10,6	8,1	0,17	0,10	66,7	44,0	22,4	12,8	0,52	0,18
Collaborative project	692	2295	11,9	8,6	0,20	0,16	78,2	68,3	25,8	20,3	0,45	0,21
Information and Communication Technologies												
Total	1515	8093	10,5	8,5	0,11	0,09	177,5	166,6	35,3	29,9	0,35	0,14
Network of Excellence	37	65	18,7	13,2	0,14	0,12	237,8	216,6	45,3	38,8	0,23	0,16
Coordination & support action	203	362	9,3	8,6	0,10	0,08	162,6	143,1	33,7	26,1	0,40	0,14
Combination of CP & CSA	26	46	15,4	12,8	0,09	0,09	121,1	152,8	24,1	28,8	0,45	0,17
Collaborative project	1249	7620	10,3	8,4	0,11	0,09	178,2	167,2	35,3	30,0	0,34	0,14
Joint Technology Initiatives (Annex IV-SP1)												
Article 171 of the Treaty	273	649	13,8	11,9	0,15	0,09	19,0	16,0	8,4	4,9	0,60	0,18

Nanosciences, Nanotechnologies, Materials and new Production Technologies													
Total	568	1772	13,4	9,1	0,09	0,07	47,8	46,6	14,2	12,2	0,54	0,18
Coordination & support action	76	89	13,1	10,0	0,08	0,07	40,5	43,1	13,1	11,5	0,63	0,20
Collaborative project	492	1683	13,5	9,1	0,09	0,07	48,9	46,8	14,4	12,3	0,53	0,18
Regions of Knowledge													
Coordination & support action	49	144	13,0	11,6	0,26	0,06	2,4	2,3	1,4	0,4	0,78	0,08
Research Infrastructures													
Total	255	337	17,7	12,8	0,17	0,13	23,6	20,7	12,8	9,8	0,66	0,32
Coordination & support action	62	48	9,6	7,6	0,16	0,10	23,6	16,8	12,9	8,0	0,67	0,30
Combination of CP & CSA	184	269	20,4	13,9	0,18	0,14	23,5	21,0	12,7	10,0	0,66	0,32
Collaborative project	9	20	16,7	11,1	0,19	0,14	27,5	21,9	14,6	10,4	0,66	0,30
Research Potential													
Coordination & support action	4	40	8,0	7,3	0,58	0,09	7,0	10,9	1,8	0,8	0,69	0,04
Science in Society													
Total	138	419	11,8	11,8	0,21	0,12	8,2	8,1	2,9	1,6	0,57	0,13
Coordination & support action	103	345	13,2	12,8	0,21	0,11	7,8	8,0	2,8	1,5	0,58	0,12
Collaborative project	35	74	7,5	7,6	0,21	0,16	10,1	9,6	3,6	2,3	0,54	0,18
Security													
Total	240	934	13,0	11,1	0,13	0,08	28,6	22,2	9,0	5,3	0,49	0,14
Network of Excellence	4	23	11,5	11,3	0,18	0,12	44,5	33,4	13,7	8,2	0,38	0,17
Coordination & support action	37	114	11,9	8,6	0,16	0,08	32,7	22,7	10,6	5,5	0,50	0,15
Collaborative project	198	795	13,2	11,4	0,13	0,08	27,6	22,0	8,6	5,2	0,49	0,14
Socio-economic sciences and Humanities													
Total	212	1636	11,4	9,7	0,25	0,15	30,2	27,4	5,7	3,5	0,36	0,09
Research for the benefit of specific groups	2	12	15,0	11,5	0,12	0,12	12,7	22,4	2,2	2,8	0,71	0,06
Coordination & support action	28	84	12,3	9,5	0,19	0,12	17,4	21,2	5,0	2,7	0,60	0,09
Collaborative project	182	1539	11,2	9,8	0,26	0,16	32,7	27,8	5,8	3,5	0,31	0,09
Space													
Total	167	389	11,4	8,5	0,18	0,11	17,4	15,8	7,5	5,1	0,56	0,22
Coordination & support action	13	19	12,0	10,3	0,13	0,08	9,9	11,4	4,6	3,4	0,66	0,19
Collaborative project	152	370	10,8	8,4	0,18	0,11	18,0	16,0	7,7	5,2	0,55	0,22
Transport (including Aeronautics)													
Total	501	1338	14,0	10,9	0,18	0,13	40,1	39,5	14,5	11,4	0,54	0,20
Coordination & support action	115	231	11,4	9,2	0,15	0,12	35,6	36,4	12,9	10,5	0,54	0,21
Collaborative project	386	1105	14,8	11,3	0,18	0,13	41,1	39,9	14,9	11,5	0,54	0,20

	EU funding per application	EU funding per application	EU funding per project	EU funding per project	Publications (N)	Publications (N)	MNCS	MNCS	ARWU	ARWU
	Projects	Rejected	Projects	Rejected	Projects	Rejected	Projects	Rejected	Projects	Rejected
Activities of International Cooperation										
Coordination & support action	101196	21764	131134	40313	2013	1926	0,72	0,70	566,0	574,3
Energy										
Total	228837	61827	395379	198600	3329	2704	0,96	0,87	384,2	450,9
Coordination & support action	150886	56710	259203	174028	2966	2300	0,88	0,77	435,6	525,4
Collaborative project	243658	61872	417833	199735	3394	2731	0,97	0,88	375,4	446,0
Environment (including Climate Change)										
Total	107956	42519	245052	153773	3192	2537	0,92	0,83	395,9	468,6
Research for the benefit of specific groups	109396	29796	201274	114515	2180	2118	0,79	0,79	497,9	498,9
Coordination & support action	80760	41171	177107	144128	2865	2498	0,86	0,79	440,6	495,2
Collaborative project	113305	42862	258756	155348	3240	2542	0,93	0,84	389,5	466,2
Food, Agriculture, and Biotechnology										
Total	95667	42599	236812	172422	3034	2777	0,89	0,85	411,1	445,2
Coordination & support action	77705	40666	170850	151062	2665	2320	0,83	0,78	474,3	502,1
Collaborative project	100272	42714	254394	174187	3100	2815	0,91	0,86	399,7	440,5
Health										
Total	180832	94718	426811	317678	4252	3665	1,02	0,95	299,2	351,3
Network of Excellence	165790	149282	432822	484854	5039	4673	1,07	1,10	255,8	238,1
Coordination & support action	133231	67935	307249	232765	3776	2727	0,95	0,82	355,2	464,2
Collaborative project	186763	96221	440735	322461	4287	3724	1,03	0,96	294,2	344,2
Information and Communication Technologies										
Total	106546	52039	356473	279240	3043	2688	0,94	0,88	400,1	443,3
Network of Excellence	79404	65180	372397	362222	3130	2523	0,94	0,86	388,7	462,8
Coordination & support action	93075	47500	292535	244257	2912	2496	0,93	0,84	413,0	469,9
Combination of CP & CSA	167983	60931	399288	274045	3625	3229	0,98	0,94	345,3	399,6
Collaborative project	108065	52001	363639	279871	3033	2696	0,94	0,88	401,3	442,0
Joint Technology Initiatives (Annex IV-SP1)										
Article 171 of the Treaty	179360	74983	351146	301639	3012	3298	0,93	0,94	400,8	379,5
Nanosciences, Nanotechnologies, Materials and new Production Technologies										
Total	146754	65182	316480	228810	3118	2900	0,95	0,91	396,6	421,2
Coordination & support action	97521	61367	206587	208087	2733	2640	0,88	0,84	445,2	462,6
Collaborative project	154161	65402	333012	230009	3157	2919	0,95	0,91	391,6	418,1
Regions of Knowledge										
Coordination & support action	103813	12668	136755	39478	1916	1313	0,74	0,65	534,8	619,2

Research Infrastructures										
Total	177095	108149	293981	225149	3454	3442	0,93	0,94	370,5	373,2
Coordination & support action	166813	94699	288229	195900	3818	3301	0,91	0,92	408,2	408,2
Combination of CP & CSA	180336	110123	297330	229050	3392	3423	0,93	0,94	370,0	373,8
Collaborative project	136889	97245	233053	208021	4077	3933	1,06	0,98	271,8	317,2
Research Potential										
Coordination & support action	93518	27701	272523	209906	1763	1419	0,60	0,63	611,1	630,8
Science in Society										
Total	79679	23485	155281	89167	2501	2210	0,81	0,76	476,7	514,3
Coordination & support action	79506	22483	154747	86686	2427	2134	0,80	0,75	484,8	523,8
Collaborative project	80573	31351	158044	108638	2744	2669	0,84	0,84	449,9	456,9
Security										
Total	151280	51184	340144	204154	2346	2263	0,83	0,80	485,1	503,2
Network of Excellence	137769	64559	416524	261413	3801	2367	0,89	0,80	432,0	502,4
Coordination & support action	91091	51159	220897	194596	1525	2064	0,71	0,78	574,8	512,4
Collaborative project	161492	50798	358137	203686	2379	2286	0,84	0,80	477,4	501,6
Socio-economic sciences and Humanities										
Total	65336	20692	212700	136129	2581	2289	0,83	0,76	467,3	512,7
Research for the benefit of specific groups	44247	12104	108697	87951	2621	2377	1,02	0,82	336,7	458,0
Coordination & support action	97029	21559	174386	115023	2247	2228	0,77	0,73	506,9	533,0
Collaborative project	60329	20724	220652	137685	2605	2290	0,83	0,76	465,4	512,2
Space										
Total	132915	71130	254196	205421	3265	3143	0,93	0,92	381,2	392,7
Coordination & support action	84898	139737	146370	406844	1674	2214	0,74	0,84	578,6	461,2
Collaborative project	135689	66845	261578	192840	3369	3199	0,94	0,93	369,8	388,6
Transport (including Aeronautics)										
Total	133631	54362	258332	166352	2696	2569	0,89	0,85	440,8	470,8
Coordination & support action	98602	50299	195492	155179	2599	2348	0,85	0,81	464,9	502,2
Collaborative project	141677	54945	272768	167925	2715	2610	0,90	0,86	436,1	464,7

Table A.2: Horizon 2020 projects, comparison of consortium characteristics in granted versus rejected applications

	Projects	Rejected	Mean number of participants per application		Centrality		Applications (N)		Projects (N)		Success rate	
			Projects	Rejected	Projects	Rejected	Projects	Rejected	Projects	Rejected	Projects	Rejected
Climate action, environment, resource efficiency and raw materials												
Total	74	245	16,7	12,3	0,26	0,12	5,5	4,8	2,4	1,1	0,66	0,13
Research and Innovation action	28	128	16,6	12,9	0,25	0,13	5,9	5,4	2,4	1,3	0,60	0,13
Innovation action	12	45	15,3	10,3	0,17	0,08	4,0	3,9	1,8	0,8	0,77	0,09
Coordination & support action	29	72	14,5	12,3	0,25	0,10	5,7	4,2	2,5	1,0	0,64	0,13
Europe in a changing world - inclusive, innovative and reflective Societies												
Total	68	889	12,0	10,0	0,22	0,07	11,1	10,8	2,1	0,7	0,47	0,04
Research and Innovation action	43	616	11,0	9,7	0,20	0,08	13,3	12,0	2,0	0,8	0,37	0,04
Innovation action	8	158	11,6	10,2	0,16	0,06	8,4	8,6	1,6	0,6	0,50	0,04
Coordination & support action	15	115	13,1	11,0	0,29	0,06	9,1	8,4	2,7	0,6	0,60	0,04
Food security, sustainable agriculture and forestry, marine and maritime and inland water research												
Total	66	283	16,1	12,5	0,18	0,09	8,1	7,5	2,7	1,4	0,63	0,09
Research and Innovation action	33	187	19,7	13,0	0,20	0,09	8,9	8,1	2,9	1,5	0,60	0,09
Innovation action	6	13	12,0	6,5	0,13	0,07	7,1	5,9	2,3	1,1	0,71	0,07
Coordination & support action	17	60	13,5	13,4	0,17	0,07	7,6	6,4	2,7	1,2	0,64	0,09
Bio-based Industries Research and Innovation action	6	11	11,5	8,5	0,07	0,07	3,7	6,7	1,5	1,3	0,72	0,09
Bio-based Industries Innovation action - Demonstration	2	10	5,5	11,5	0,15	0,04	12,9	4,1	3,6	0,8	0,73	0,09
Future and Emerging Technologies												
Total	51	919	7,1	6,3	0,30	0,24	29,2	27,0	2,8	1,5	0,28	0,04
Research and Innovation action	44	896	7,4	6,3	0,30	0,24	29,8	27,1	2,8	1,5	0,27	0,04
Coordination & support action	7	23	5,7	6,6	0,31	0,26	24,6	25,6	2,6	1,4	0,28	0,04
Health, demographic change and wellbeing												
Total	177	2015	12,5	8,6	0,19	0,12	34,0	31,5	4,9	3,2	0,39	0,07
Research and Innovation action	150	1959	12,0	8,6	0,20	0,12	38,0	32,0	5,1	3,3	0,33	0,07
Innovation action	5	38	14,8	11,2	0,09	0,05	13,6	16,6	2,0	1,4	0,47	0,05
Coordination & support action	10	14	13,4	11,7	0,17	0,12	26,1	28,4	4,6	3,0	0,50	0,10
Industrial Leadership												
Total	134	911	12,6	10,5	0,08	0,05	20,3	20,2	3,7	2,5	0,52	0,07
Research and Innovation action	64	527	12,3	9,7	0,08	0,05	18,9	20,6	3,4	2,5	0,48	0,08
Innovation action	49	340	14,0	11,7	0,08	0,05	20,0	20,0	3,6	2,5	0,55	0,07
Coordination & support action	20	44	8,5	9,7	0,11	0,04	32,0	16,5	5,6	2,1	0,52	0,07

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Industrial Leadership - ICT											
Total	255	1660	10,1	9,4	0,09	0,06	31,1	28,1	5,8	4,1	0,45	0,09
Research and Innovation action	145	1262	9,2	9,0	0,09	0,06	33,2	30,4	6,2	4,5	0,40	0,09
Innovation action	62	294	9,0	9,0	0,08	0,04	30,3	20,0	5,6	2,8	0,47	0,07
ECSEL Research and Innovation Action	6	33	26,8	25,5	0,12	0,07	29,2	28,3	5,2	4,2	0,45	0,09
ECSEL Innovation Action	6	8	29,0	29,3	0,12	0,07	26,9	28,1	5,4	4,4	0,63	0,11
Coordination & support action	32	60	9,9	7,9	0,08	0,04	29,0	18,6	5,5	2,6	0,50	0,08
Industrial Leadership - Space											
Total	51	275	9,6	7,7	0,20	0,10	8,8	8,5	2,9	1,6	0,56	0,11
Research and Innovation action	28	199	8,4	7,7	0,20	0,12	11,2	9,9	3,6	2,0	0,54	0,12
Innovation action	17	60	7,8	7,2	0,09	0,04	5,8	5,0	2,0	0,8	0,58	0,09
Coordination & support action	6	16	20,7	9,3	0,30	0,03	7,4	3,9	2,5	0,6	0,57	0,10
Research infrastructures											
Total	78	184	18,3	13,8	0,19	0,11	10,7	8,5	5,2	3,0	0,62	0,21
Research and Innovation action	59	158	20,4	14,4	0,20	0,11	11,1	8,5	5,3	3,0	0,61	0,21
Coordination & support action	19	26	12,0	9,7	0,15	0,11	8,6	8,2	4,5	3,0	0,68	0,23
Science with and for Society											
Total	23	137	12,8	9,7	0,32	0,05	2,6	2,5	1,3	0,2	0,70	0,06
Research and Innovation action	7	55	7,1	8,8	0,16	0,05	2,8	2,7	1,3	0,2	0,66	0,05
Coordination & support action	16	82	15,3	10,4	0,35	0,06	2,6	2,4	1,4	0,3	0,71	0,06
Secure societies - Protecting freedom and security of Europe and its citizens											
Total	35	271	13,1	12,3	0,14	0,04	6,4	5,3	1,8	0,6	0,59	0,05
Research and Innovation action	17	160	14,6	13,2	0,15	0,04	7,1	5,3	1,8	0,6	0,56	0,05
Innovation action	11	70	12,2	10,9	0,14	0,05	6,4	5,4	1,9	0,6	0,62	0,06
Coordination & support action	7	41	11,0	10,9	0,10	0,04	4,2	5,2	1,4	0,5	0,62	0,05
Secure, clean and efficient energy											
Total	147	795	12,0	10,2	0,14	0,08	9,5	9,8	2,5	1,4	0,57	0,09
Research and Innovation action	56	385	10,0	8,4	0,14	0,10	11,7	12,0	2,8	1,8	0,49	0,09
Innovation action	37	191	15,1	14,3	0,16	0,07	9,4	8,0	2,4	1,1	0,59	0,07
Coordination & support action	47	219	11,9	10,0	0,12	0,07	8,0	8,9	2,3	1,4	0,58	0,10
Smart, green and integrated transport											
Total	95	317	14,0	9,3	0,16	0,08	8,1	7,8	3,0	1,8	0,65	0,12
Research and Innovation action	66	232	13,4	9,2	0,16	0,09	8,7	8,1	3,1	1,9	0,64	0,13
Innovation action	16	30	19,0	7,6	0,16	0,05	5,5	5,2	2,5	1,1	0,75	0,10
Coordination & support action	13	55	11,0	10,3	0,14	0,07	10,2	7,6	3,4	1,6	0,51	0,12
Spreading excellence and widening participation											
Coordination & support action	36	253	4,0	4,1	0,16	0,07	7,0	6,2	1,9	0,7	0,47	0,07

	EU funding per application		EU funding per project		Publications (N)		MNCS		ARWU	
	Projects	Rejected	Projects	Rejected	Projects	Rejected	Projects	Rejected	Projects	Rejected
Climate action, environment, resource efficiency and raw materials										
Total	194078,59	46302,27	322081,37	141595,23	2738,72	2571,83	0,90	0,84	441,38	468,54
Research and Innovation action	230856,91	53720,66	415787,96	164065,65	2884,33	3049,49	0,93	0,91	413,03	405,00
Innovation action	251434,90	33291,65	334523,36	102614,03	2473,59	2174,97	0,86	0,82	510,01	501,78
Coordination & support action	111421,02	39212,69	204102,60	119897,51	2599,04	1639,79	0,85	0,68	476,01	600,07
Cross-theme										
Innovation action	418989,38	7376,87	517330,89	23255,68	5034,12	2841,68	1,09	0,93	198,28	426,35
Europe in a changing world - inclusive, innovative and reflective Societies										
Total	85006,35	11027,38	213558,03	87578,76	2603,82	2240,02	0,81	0,76	474,37	514,12
Research and Innovation action	72233,30	11531,33	233302,62	95777,23	2554,46	2249,99	0,80	0,76	478,64	512,60
Innovation action	103710,86	10244,58	238980,03	73667,27	2220,63	2364,23	0,80	0,80	514,70	496,55
Coordination & support action	89594,38	9639,59	162428,16	66420,98	3280,39	2034,39	0,90	0,71	409,25	543,99
Food security, sustainable agriculture and forestry, marine and maritime and inland water research										
Total	169869,81	30295,75	295248,06	117319,47	2993,99	2594,72	0,88	0,83	428,91	466,71
Research and Innovation action	159951,40	30739,22	298347,70	120930,26	3010,58	2738,60	0,86	0,85	435,62	448,41
Innovation action	141730,99	21818,75	249172,63	82116,38	3660,39	2670,64	0,94	0,91	359,52	411,00
Coordination & support action	117745,85	29235,21	216055,60	109273,05	2510,89	2122,91	0,90	0,75	447,90	529,36
Bio-based Industries Research and Innovation action	113670,77	30005,97	187627,11	111394,48	2274,82	2085,72	0,86	0,72	461,57	542,81
Bio-based Industries Innovation action - Demonstration	1380699,07	36841,87	1527978,48	134633,32	3091,71	2709,28	1,12	0,96	259,67	425,28
Future and Emerging Technologies										
Total	132323,26	19967,20	491538,99	227889,99	3890,45	3363,87	1,02	0,97	326,00	362,17
Research and Innovation action	134260,89	19995,45	513614,71	228232,10	3912,16	3373,11	1,02	0,97	323,72	361,56
Coordination & support action	116628,45	18916,67	312725,59	215166,67	3692,85	2917,49	1,01	0,93	346,70	391,73
Health, demographic change and wellbeing										
Total	145028,88	32504,40	441459,40	266898,88	4303,13	3533,70	1,02	0,94	298,73	370,38
Research and Innovation action	141111,15	32900,87	476929,30	270260,19	4372,75	3560,12	1,03	0,95	291,63	367,38
Innovation action	82869,89	19176,99	249245,80	162937,80	1786,30	2119,03	0,73	0,78	573,06	523,64
Coordination & support action	100579,39	29751,82	262767,28	221459,25	4292,24	3550,33	1,04	0,92	301,63	382,84
Industrial Leadership										
Total	196104,62	32952,79	411663,85	191372,54	2859,92	2541,33	0,93	0,87	423,86	466,49
Research and Innovation action	198274,46	34651,62	432845,49	200962,72	2917,80	2727,06	0,93	0,89	426,83	445,52
Innovation action	210491,75	31757,18	430590,18	186308,14	2626,20	2409,66	0,89	0,85	440,82	481,65
Coordination & support action	103014,10	23750,02	256098,28	123661,04	3627,24	1448,50	1,06	0,72	319,56	587,94

Industrial Leadership - ICT										
Total	155090,94	41924,84	405941,21	238563,13	2822,21	2464,11	0,91	0,85	420,21	474,58
Research and Innovation action	156478,67	44578,95	442882,96	257122,22	3003,24	2558,09	0,93	0,86	402,14	462,02
Innovation action	150897,23	29799,27	393970,92	164550,11	2423,89	2143,15	0,83	0,78	470,08	520,16
ECSEL Research and Innovation Action	124641,61	48493,33	349355,78	267071,79	1591,14	1721,98	0,76	0,76	574,26	546,35
ECSEL Innovation Action	260133,42	54344,07	447146,64	237599,42	3011,27	2136,04	1,04	0,79	349,44	510,16
Coordination & support action	97746,93	29432,46	269815,71	162315,89	2947,71	2501,93	0,95	0,81	391,70	489,46
Industrial Leadership - Space										
Total	124152,61	29464,00	236875,82	112315,40	2890,81	3063,78	0,91	0,93	409,66	385,81
Research and Innovation action	144896,43	32138,83	283470,37	122281,80	3129,45	3253,71	0,94	0,96	378,70	357,46
Innovation action	120439,04	21210,42	217265,80	86229,30	1975,45	2035,09	0,78	0,75	547,73	546,75
Coordination & support action	88792,90	25981,28	169446,82	85808,79	2936,47	2493,77	0,92	0,83	389,74	455,76
Research infrastructures										
Total	201695,13	88142,24	359759,04	228317,74	3566,62	3267,88	0,96	0,93	352,31	382,62
Research and Innovation action	207266,50	86573,91	373744,62	225034,20	3616,60	3319,03	0,97	0,93	347,79	375,61
Coordination & support action	172298,81	102294,42	285966,71	257947,55	3215,98	2735,58	0,94	0,86	384,08	455,52
Science with and for Society										
Total	104268,05	12174,80	164870,13	39792,28	2478,47	2248,73	0,82	0,76	471,24	520,91
Research and Innovation action	119681,15	11268,20	200173,80	39971,14	2427,58	2286,40	0,82	0,79	487,07	502,58
Coordination & support action	101122,52	12692,09	157665,30	39690,23	2493,01	2225,60	0,82	0,73	466,72	532,17
Secure societies - Protecting freedom and security of Europe and its citizens										
Total	190056,03	21894,85	353107,70	102642,87	2099,51	2238,58	0,74	0,80	548,39	506,04
Research and Innovation action	193334,14	21012,39	373431,70	96148,48	1749,21	2314,62	0,67	0,81	595,80	497,50
Innovation action	224882,98	26486,10	393382,13	127308,92	2283,67	2337,66	0,80	0,83	525,97	485,97
Coordination & support action	118889,99	18192,22	217560,63	91076,83	2526,24	1854,73	0,81	0,71	487,56	559,21
Secure, clean and efficient energy										
Total	289081,90	44843,57	508963,21	191006,50	2810,49	2441,83	0,91	0,84	434,85	482,43
Research and Innovation action	255430,11	53067,66	515321,64	236467,69	3001,14	2780,48	0,95	0,90	395,70	438,37
Innovation action	457946,85	42303,15	774366,52	174765,45	3082,76	2210,59	0,92	0,81	426,88	512,98
Coordination & support action	115934,41	35925,40	218740,22	144433,10	1898,67	1814,51	0,82	0,73	550,15	563,44
Smart, green and integrated transport										
Total	270484,48	48944,78	412406,63	160479,23	2840,72	2595,16	0,91	0,86	420,17	460,87
Research and Innovation action	244946,84	49180,53	391669,58	161036,31	2949,86	2696,07	0,92	0,88	402,97	445,25
Innovation action	422527,22	54589,89	555484,23	151640,55	2504,83	1692,29	0,88	0,79	452,18	543,01
Coordination & support action	105665,57	45790,15	236869,37	161927,33	2808,92	2452,48	0,86	0,81	459,58	492,06
Spreading excellence and widening participation										
Coordination & support action	139502,31	27567,88	295820,38	110712,26	2838,78	2812,46	0,88	0,88	440,73	439,69

Table A.3 Food, Agriculture, and Biotechnology						
HES, Collaborative project	NL	DK	**NO**	SE	FI	AT
Success rate	23,17	22,86	**20,00**	19,80	16,75	16,26
Partners per application	0,92	0,98	**15,25**	0,97	0,95	0,95
Applications (N)	518	468	**160**	394	197	246
Coordinators						
ARWU	0,9	0,8	**376,8**	0,9	1,0	1,14
Centrality	1,66	1,71	**0,14**	1,27	1,12	1,19
EU funding per application	1,23	1,20	**70828,8**	1,16	0,95	1,20
EU funding per project	1,09	1,04	**301158,2**	1,06	0,96	0,89
Mean number of applications	1,67	1,60	**63,7**	1,24	1,13	1,07
Mean number of projects	1,92	1,85	**15,5**	1,39	1,16	0,91
MNCS	1,08	1,08	**0,93**	1,04	1,04	0,91
Publications	1,21	1,27	**3068,5**	1,09	1,08	0,94
Success rate	1,10	1,12	**0,21**	1,05	0,91	0,89
Partners						
ARWU	0,8	0,9	**447,5**	0,9	0,9	1,11
Centrality	1,21	1,24	**0,09**	1,06	0,99	1,04
EU funding per application	1,09	1,07	**56650,0**	1,04	0,92	0,97
EU funding per project	1,06	1,00	**199491,2**	1,02	0,95	0,98
Mean number of applications	1,27	1,22	**39,5**	1,08	1,03	0,95
Mean number of projects	1,31	1,26	**10,3**	1,10	1,01	0,90
MNCS	1,11	1,07	**0,85**	1,07	1,05	0,97
Publications	1,24	1,20	**2669,7**	1,18	1,20	0,98
Success rate	1,02	1,07	**0,24**	0,94	0,88	0,91

Table A.4 Food, Agriculture, and Biotechnology						
PRC, Collaborative project	**NO**	NL	AT	DK	SE	FI
Success rate	**23,13**	22,67	20,65	20,28	16,67	14,52
Partners per application	**15,82**	0,93	1,01	0,96	0,71	0,98
Applications (N)	**147**	525	184	217	168	124
Coordinators						
ARWU	**370,8**	0,9	1,1	0,8	0,9	1,21
Centrality	**0,16**	1,28	0,95	1,32	0,79	1,03
EU funding per application	**72295,1**	1,16	1,09	1,12	0,92	0,95
EU funding per project	**289450,3**	1,07	1,08	1,06	1,00	0,85
Mean number of applications	**72,04**	1,24	0,96	1,30	0,77	0,94
Mean number of projects	**19,25**	1,37	0,89	1,29	0,69	1,01
MNCS	**0,94**	1,06	1,01	1,07	1,05	0,94
Publications	**3183,17**	1,10	0,87	1,22	1,10	0,99
Success rate	**0,21**	1,04	0,97	1,02	0,86	1,11
Partners						
ARWU	**445,9**	0,9	1,0	0,9	0,9	1,03
Centrality	**0,08**	1,19	0,99	1,22	0,76	0,97
EU funding per application	**53979,3**	1,09	0,98	0,98	0,86	0,88
EU funding per project	**170675,7**	1,12	1,01	1,04	0,91	0,92
Mean number of applications	**31,1**	1,20	1,00	1,23	0,79	0,97
Mean number of projects	**8,10**	1,26	0,98	1,25	0,73	0,82
MNCS	**0,86**	1,05	1,01	1,06	1,04	1,02
Publications	**2665,29**	1,15	1,05	1,21	1,14	1,02
Success rate	**0,24**	1,00	0,95	0,93	0,83	0,81

Table A.5 Food, Agriculture, and Biotechnology				
REC, Coordination & support action	NL	FI	AT	**NO**
Success rate	58,23	45,45	28,00	**25,00**
Partners per application	**0,91**	**1,03**	**1,09**	**15,65**
Applications (N)	79	33	25	**20**
Coordinators				
ARWU	**0,8**	**0,9**	**0,9**	**484,4**
Centrality	**1,78**	**1,27**	**1,26**	**0,18**
EU funding per application	**1,80**	**1,46**	**1,06**	**67141,1**
EU funding per project	**1,24**	**1,15**	**0,95**	**241460,3**
Mean number of applications	**1,74**	**1,26**	**1,20**	**67,53**
Mean number of projects	**2,21**	**1,56**	**1,54**	**19,68**
MNCS	**1,05**	1,00	**1,02**	**0,86**
Publications	**1,10**	1,00	**0,76**	**2782,20**
Success rate	**1,64**	**1,51**	**1,04**	**0,23**
Partners				
ARWU	**0,9**	**0,7**	**0,9**	**546,6**
Centrality	**1,55**	**1,38**	**1,16**	**0,09**
EU funding (sum)	**1,83**	**1,49**	**1,21**	**2950682,9**
EU funding per application	**1,66**	**1,47**	**1,27**	**41599,1**
EU funding per project	**1,23**	**1,26**	**1,13**	**143558,4**
Mean number of applications	**1,40**	**1,30**	**1,11**	**34,41**
Mean number of projects	**1,77**	**1,45**	**1,23**	**9,29**
MNCS	**1,12**	**1,27**	**1,13**	**0,73**
Publications	**1,23**	**1,54**	**1,27**	**2153,41**
Success rate	**1,91**	**1,77**	**1,38**	**0,23**

Table A.6 Food, Agriculture, and Biotechnology						
REC, Collaborative project	NL	DK	**NO**	FI	AT	SE
Success rate	29,85	24,72	**23,24**	22,05	21,93	15,52
Partners per application	**1,00**	**1,06**	**15,24**	1,00	**0,96**	**1,06**
Applications (N)	526	89	**241**	263	114	58
Coordinators						
ARWU	**0,9**	**0,9**	**392,0**	1,0	**1,0**	**0,74**
Centrality	**1,55**	**0,84**	**0,19**	**1,01**	**0,74**	**0,68**
EU funding per application	**1,22**	**0,96**	**78406,6**	**1,01**	**0,95**	**0,73**
EU funding per project	**1,11**	**1,05**	**287317,9**	**1,11**	**0,97**	**1,09**
Mean number of applications	**1,48**	**0,84**	**81,28**	**1,06**	**0,72**	**0,88**
Mean number of projects	**1,74**	**0,83**	**22,92**	**0,99**	**0,76**	**0,88**
MNCS	**1,06**	**1,03**	**0,91**	**1,01**	**0,97**	**0,82**
Publications	**1,02**	**1,21**	**3173,31**	**1,06**	**0,93**	**0,88**
Success rate	**1,16**	**0,91**	**0,23**	**0,92**	**0,86**	**1,16**
Partners						
ARWU	**0,9**	**0,9**	**456,9**	**1,0**	**1,0**	**0,79**
Centrality	**1,23**	**0,87**	**0,10**	1,00	**0,89**	**0,78**
EU funding (sum)	**1,38**	**0,83**	**3794458,1**	**1,04**	**0,92**	**0,81**
EU funding per application	**1,13**	**0,99**	**57394,4**	**0,95**	**0,93**	**1,13**
EU funding per project	**1,05**	**0,97**	**188665,8**	**1,03**	**0,96**	**0,87**
Mean number of applications	**1,20**	**0,87**	**39,66**	**1,06**	**0,92**	**0,86**
Mean number of projects	**1,34**	**0,84**	**10,77**	**1,01**	**0,92**	**0,73**
MNCS	**1,04**	**1,06**	**0,85**	**1,02**	**1,03**	**0,92**
Publications	**1,12**	**1,13**	**2672,50**	**1,08**	**1,03**	**1,07**
Success rate	**1,10**	**1,01**	**0,25**	**0,93**	**0,87**	**0,74**

Table A.7 Food security, sustainable agriculture and forestry, marine and maritime and inland water research HES, Research and Innovation						
action	DK	SE	NO	NL	AT	FI
Success rate	21,67	16,28	16,00	14,81	8,33	4,00
Partners per application	0,91	0,84	20,28	0,82	1,07	0,56
Applications (N)	60	43	25	54	24	25
Coordinators						
ARWU	0,7	0,9	406,5	0,9	1,3	0,73
Centrality	1,56	1,10	0,23	1,49	0,43	0,39
EU funding per application	1,03	1,11	120729,7	0,66	0,41	0,61
EU funding per project	0,77	0,63	551302,5	0,62	0,39	1,17
Mean number of applications	1,42	1,10	15,40	1,79	0,61	0,96
Mean number of projects	1,72	1,26	3,28	1,74	0,47	0,75
MNCS	1,11	0,99	0,93	1,09	0,84	0,74
Publications	1,28	0,89	3452,83	1,03	0,69	0,62
Success rate	1,18	1,17	0,21	0,91	0,63	1,05
Partners						
ARWU	0,9	0,9	478,4	0,9	1,0	0,58
Centrality	1,00	0,85	0,13	0,83	0,59	0,21
EU funding (sum)	1,32	1,31	530769,6	1,34	0,82	0,99
EU funding per application	1,13	0,98	55354,1	0,93	0,60	1,10
EU funding per project	1,11	1,05	142262,6	1,04	0,76	0,45
Mean number of applications	1,16	1,18	6,81	1,24	0,96	0,48
Mean number of projects	1,20	1,14	1,50	1,14	0,77	0,57
MNCS	1,01	1,05	0,85	1,04	1,01	0,91
Publications	1,17	1,26	2362,94	1,27	1,02	1,01
Success rate	1,02	0,82	0,23	0,76	0,49	0,39

Table A.8 Food security, sustainable agriculture and forestry, marine and maritime and inland water research PRC, Research and Innovation		
action	NL	NO
Success rate	15,52	15,00
Partners per application	1,01	18,95
Applications (N)	58	20
Coordinators		
ARWU	1,0	353,1
Centrality	0,97	0,27
EU funding per application	0,88	105553,6
EU funding per project	0,71	460347,2
Mean number of applications	1,18	18,00
Mean number of projects	1,03	4,35
MNCS	0,97	0,98
Publications	0,96	3416,99
Success rate	0,75	0,19
Partners		
ARWU	1,0	467,8
Centrality	1,10	0,10
EU funding (sum)	1,20	549779,7
EU funding per application	1,24	45300,8
EU funding per project	1,04	137641,4
Mean number of applications	1,14	6,56
Mean number of projects	1,13	1,38
MNCS	1,00	0,84
Publications	1,11	2427,86
Success rate	1,20	0,17

Table A.9 Food security, sustainable agriculture and forestry, marine and maritime and inland water research						
PRC, Total	SE	NL	DK	FI	**NO**	AT
Success rate	25,00	20,95	20,00	17,39	**11,54**	7,14
Partners per application	**0,66**	**0,89**	**0,96**	**0,88**	**17,62**	**1,06**
Applications (N)	20	105	30	23	**26**	28
Coordinators						
ARWU	**1,1**	**0,9**	**1,2**	**1,3**	**372,3**	**1,01**
Centrality	**0,52**	**0,91**	**1,11**	**0,37**	**0,23**	**0,55**
EU funding per application	**2,44**	**1,59**	**0,85**	**1,37**	**92936,7**	**0,73**
EU funding per project	**0,91**	**1,10**	**0,79**	**0,56**	**394305,9**	**0,88**
Mean number of applications	**0,74**	**1,14**	**1,18**	**0,50**	**15,23**	**0,95**
Mean number of projects	**0,51**	**1,04**	**1,23**	**0,38**	**3,73**	**0,94**
MNCS	**0,95**	**0,99**	**0,87**	**0,87**	**0,95**	**0,81**
Publications	**0,68**	**0,95**	**0,73**	**0,47**	**3438,58**	**0,88**
Success rate	**0,97**	**1,14**	**1,04**	**1,32**	**0,17**	**1,06**
Partners						
ARWU	**1,0**	**0,9**	**0,9**	**1,0**	**484,3**	**0,69**
Centrality	**0,49**	**1,10**	**1,04**	**0,56**	**0,09**	**0,59**
EU funding (sum)	**0,52**	**1,28**	**1,07**	**0,79**	**502418,6**	**0,81**
EU funding per application	**2,06**	**1,46**	**1,04**	**1,28**	**41893,6**	**1,04**
EU funding per project	**0,98**	**1,12**	**0,91**	**0,89**	**128558,0**	**1,13**
Mean number of applications	**0,54**	**1,15**	**1,13**	**0,81**	**6,14**	**0,76**
Mean number of projects	**0,56**	**1,20**	**1,11**	**0,73**	**1,27**	**0,74**
MNCS	1,00	**1,03**	**1,07**	**0,99**	**0,82**	1,00
Publications	**1,11**	**1,19**	**1,22**	**1,03**	**2327,42**	**1,07**
Success rate	**1,49**	**1,39**	**1,37**	**1,04**	**0,15**	**0,76**

Table A.10 Food security, sustainable agriculture and forestry, marine and maritime and inland water research			
REC, Research and Innovation action	**NO**	NL	FI
Success rate	**26,32**	23,53	17,24
Partners per application	**20,29**	**0,94**	**0,83**
Applications (N)	**38**	68	29
Coordinators			
ARWU	**431,9**	**0,9**	**0,9**
Centrality	**0,29**	**1,45**	**1,35**
EU funding per application	**148158,2**	**0,68**	**0,62**
EU funding per project	**502819,8**	**0,76**	**0,58**
Mean number of applications	**17,82**	**1,81**	**1,40**
Mean number of projects	**4,11**	**1,86**	**1,67**
MNCS	**0,90**	**0,98**	**0,92**
Publications	**3636,86**	**0,85**	**0,96**
Success rate	**0,27**	**0,77**	**0,92**
Partners			
ARWU	**465,0**	**0,9**	**1,0**
Centrality	**0,13**	**0,97**	**0,85**
EU funding (sum)	**672315,6**	**1,25**	**0,98**
EU funding per application	**71818,4**	**0,87**	**0,57**
EU funding per project	**178127,9**	**0,90**	**0,72**
Mean number of applications	**7,44**	**1,15**	**1,12**
Mean number of projects	**1,72**	**1,14**	**1,02**
MNCS	**0,86**	**1,01**	**0,98**
Publications	**2587,89**	**1,15**	**1,01**
Success rate	**0,25**	**0,97**	**0,79**

Table A.11 Food security, sustainable agriculture and forestry, marine and maritime and inland water research					
REC, Total	AT	**NO**	NL	FI	DK
Success rate	33,33	**26,92**	26,67	20,37	18,18
Partners per application	0,93	18,50	0,92	0,85	1,06
Applications (N)	21	**52**	105	54	33
Coordinators					
ARWU	1,1	467,9	0,8	0,9	0,7
Centrality	0,81	0,26	1,45	1,19	0,80
EU funding per application	0,65	135294,9	1,08	0,61	0,58
EU funding per project	0,56	439731,1	1,00	0,65	0,74
Mean number of applications	1,00	15,90	1,83	1,38	0,98
Mean number of projects	0,95	3,69	1,91	1,52	0,94
MNCS	0,97	0,84	1,08	0,98	1,19
Publications	0,80	2965,25	1,03	1,04	1,12
Success rate	1,10	0,26	0,87	0,92	0,70
Partners					
ARWU	1,0	478,9	0,9	1,0	1,0
Centrality	0,98	0,13	0,97	0,78	0,85
EU funding (sum)	1,14	623812,7	1,37	0,97	0,81
EU funding per application	0,85	70235,0	0,88	0,61	0,72
EU funding per project	0,86	171213,2	0,93	0,72	0,75
Mean number of applications	1,15	7,12	1,20	1,06	0,84
Mean number of projects	1,19	1,66	1,20	0,99	0,82
MNCS	0,94	0,84	1,03	0,99	1,00
Publications	1,04	2479,96	1,16	1,04	1,05
Success rate	1,06	0,26	0,95	0,82	0,84

Table A.12 Climate action, environment, resource efficiency and raw materials				
REC, Total	FI	NL	**NO**	AT
Success rate	34,48	30,88	**25,93**	17,86
Partners per application	0,9	0,8	19,2	0,9
Applications (N)	58	68	**27**	28
Coordinators				
ARWU	2,2	1,9	190,6	2,3
Centrality	0,95	0,65	0,35	0,79
EU funding per application	0,94	1,07	180225,6	0,56
EU funding per project	0,80	0,89	503806,6	0,60
Mean number of applications	0,99	0,78	10,63	0,86
Mean number of projects	1,14	0,75	2,93	0,79
MNCS	0,76	0,86	1,15	0,81
Publications	0,76	0,67	3912,15	0,71
Success rate	1,21	1,10	0,28	0,80
Partners				
ARWU	1,2	1,2	357,8	1,3
Centrality	1,04	0,97	0,21	0,82
EU funding (sum)	0,92	0,94	789974,1	0,76
EU funding per application	0,86	1,03	113702,1	0,66
EU funding per project	0,84	0,96	250749,1	0,73
Mean number of applications	1,09	0,94	5,73	0,92
Mean number of projects	1,12	0,99	1,81	0,82
MNCS	0,90	0,93	0,97	0,87
Publications	0,92	0,94	3139,60	0,83
Success rate	1,12	1,16	0,30	0,83

Table A.13 Energy						
HES, Collaborative project	DK	**NO**	NL	SE	FI	AT
Success rate	33,33	**28,57**	24,31	20,54	17,81	14,91
Partners per application	1,0	**11,7**	0,9	1,0	0,9	1,0
Applications (N)	135	**63**	181	185	73	114
Coordinators						
ARWU	1,4	233,5	1,4	1,5	2,3	2,22
Centrality	0,87	0,26	0,79	0,53	0,36	0,60
EU funding per application	1,31	130818,3	0,99	1,22	0,95	0,68
EU funding per project	1,26	349012,0	1,01	1,13	0,95	0,39
Mean number of applications	0,81	38,90	0,77	0,59	0,41	1,13
Mean number of projects	0,87	12,30	0,76	0,49	0,32	0,72
MNCS	1,03	1,01	1,01	0,92	0,71	0,87
Publications	0,79	4430,75	0,77	0,74	0,43	0,75
Success rate	1,12	0,26	0,95	0,92	0,86	0,86
Partners						
ARWU	0,9	417,5	0,9	0,9	1,2	0,69
Centrality	1,22	0,15	0,87	0,83	0,61	0,68
EU funding (sum)	1,41	3129118,6	0,82	0,81	0,58	0,87
EU funding per application	1,28	106503,2	0,89	0,87	0,89	0,80
EU funding per project	1,09	276229,7	0,89	0,87	0,89	0,70
Mean number of applications	1,26	20,49	0,99	0,98	0,71	0,74
Mean number of projects	1,31	6,59	0,88	0,86	0,61	0,91
MNCS	1,14	0,89	1,12	1,04	0,97	0,92
Publications	1,19	2741,86	1,26	1,15	0,97	1,00
Success rate	1,14	0,28	0,97	0,89	0,82	0,79

Table A.14 Energy						
PRC, Collaborative project	**NO**	DK	FI	NL	SE	AT
Success rate	**37,00**	28,40	28,38	25,48	24,24	21,34
Partners per application	**13,1**	0,84	0,94	0,87	0,71	0,82
Applications (N)	**100**	162	74	310	165	0,82
Coordinators						
ARWU	173,4	2,1	2,6	2,2	2,3	3,11
Centrality	0,25	0,67	0,62	0,78	0,37	0,54
EU funding per application	212754,6	1,05	1,20	0,89	1,06	0,63
EU funding per project	478220,1	0,96	0,96	0,88	0,95	0,37
Mean number of applications	35,47	0,69	0,58	0,86	0,43	1,15
Mean number of projects	12,10	0,68	0,56	0,76	0,33	0,57
MNCS	1,13	0,90	0,72	0,83	0,76	0,72
Publications	5065,24	0,62	0,48	0,62	0,56	0,60
Success rate	0,33	0,74	0,87	0,77	0,72	0,76
Partners						
ARWU	409,3	1,0	1,1	1,0	1,1	0,62
Centrality	0,15	0,84	0,70	0,77	0,57	0,64
EU funding (sum)	3028187,1	0,90	0,71	0,79	0,47	0,83
EU funding per application	136838,4	0,81	0,82	0,80	0,76	0,70
EU funding per project	298704,1	0,85	0,80	0,83	0,80	0,61
Mean number of applications	19,56	0,92	0,80	0,88	0,57	0,58
Mean number of projects	6,57	0,86	0,70	0,79	0,52	0,72
MNCS	0,93	1,01	0,94	0,98	0,95	0,73
Publications	3153,53	0,94	0,82	0,95	0,88	0,93
Success rate	0,36	0,80	0,81	0,80	0,83	0,65

Table A.15 Energy						
REC, Collaborative project	DK	NL	**NO**	FI	AT	
Success rate	44,83	35,52	**31,06**	29,17	25,33	
Partners per application	**1,20**	**0,94**	**12,81**	**0,95**	**0,98**	
Applications (N)	29	183	**132**	72	75	
Coordinators						
ARWU	**0,6**	**1,0**	**324,7**	**1,3**	**1,6**	
Centrality	**0,77**	**1,08**	**0,27**	**0,62**	**0,80**	
EU funding per application	**2,54**	**1,59**	**154510,7**	**1,54**	**2,77**	
EU funding per project	**1,64**	**1,28**	**408670,7**	**1,09**	**1,61**	
Mean number of applications	**0,68**	**0,99**	**40,80**	**0,54**	**0,94**	
Mean number of projects	**0,76**	**1,13**	**12,85**	**0,56**	**0,79**	
MNCS	**1,16**	**1,04**	**0,98**	**0,92**	**0,81**	
Publications	**1,39**	**0,83**	**4024,71**	**0,72**	**0,60**	
Success rate	**1,03**	**1,26**	**0,28**	**1,03**	**0,99**	
Partners						
ARWU	**1,1**	**1,0**	**403,1**	**1,2**	**1,2**	
Centrality	**0,85**	**1,05**	**0,16**	**0,93**	**0,71**	
EU funding per application	**1,02**	**0,93**	**125566,7**	**1,06**	**0,76**	
EU funding per project	**0,90**	**0,91**	**301907,0**	**0,96**	**0,78**	
Mean number of applications	**0,77**	**1,10**	**20,99**	**0,98**	**0,80**	
Mean number of projects	**0,79**	**1,10**	**6,86**	**0,92**	**0,74**	
MNCS	**0,97**	**0,99**	**0,93**	**0,91**	**0,93**	
Publications	**0,97**	**0,96**	**3093,10**	**0,84**	**0,86**	
Success rate	**1,20**	**1,02**	**0,33**	**0,98**	**0,74**	

A.16 Environment (including Climate Change)						
HES, Collaborative project	DK	NL	**NO**	FI	AT	SE
Success rate	28,92	26,82	**25,16**	22,22	22,06	21,37
Partners per application	**1,03**	**0,91**	**15,50**	**0,97**	**1,04**	**0,93**
Applications (N)	249	481	**155**	117	272	393
Coordinators						
ARWU	**0,8**	**0,8**	**411,2**	**0,9**	**1,0**	**0,89**
Centrality	**1,14**	**1,06**	**0,21**	**0,81**	**0,86**	**0,83**
EU funding per application	**0,89**	**0,82**	**116453,7**	**0,76**	**0,71**	**0,93**
EU funding per project	**0,97**	**0,90**	**337063,4**	**0,82**	**0,80**	**1,18**
Mean number of applications	**1,22**	**1,14**	**44,31**	**0,84**	**0,98**	1,00
Mean number of projects	**1,12**	**1,09**	**13,99**	**0,78**	**0,82**	**0,89**
MNCS	**1,10**	**1,11**	**0,92**	**0,98**	**1,01**	**0,89**
Publications	**1,34**	**1,38**	**2629,87**	**1,18**	**1,04**	**0,93**
Success rate	**0,93**	**0,91**	**0,29**	**0,86**	**0,81**	**0,94**
Partners						
ARWU	**0,9**	**1,0**	**401,0**	**1,0**	**1,1**	**0,94**
Centrality	**1,03**	**0,96**	**0,16**	**0,94**	**0,76**	**0,68**
EU funding per application	**0,94**	**0,91**	**73930,7**	**0,82**	**0,74**	**1,03**
EU funding per project	**0,96**	**0,92**	**218301,2**	**0,85**	**0,79**	**0,82**
Mean number of applications	**1,06**	**1,01**	**34,70**	**0,97**	**0,84**	**0,92**
Mean number of projects	**1,03**	**0,99**	**10,25**	**0,95**	**0,76**	**0,84**
MNCS	1,00	1,00	**0,91**	**0,97**	**0,93**	**0,99**
Publications	**1,04**	**1,03**	**2974,45**	**1,01**	**0,81**	**0,95**
Success rate	**0,98**	**0,96**	**0,28**	**0,85**	**0,81**	**0,88**

A.17 Environment (including Climate Change)						
PRC, Collaborative project	**NO**	NL	DK	AT	SE	FI
Success rate	**24,36**	23,89	23,26	21,53	16,95	14,06
Partners per application	**17,18**	**0,89**	**0,85**	**0,86**	**0,62**	**0,83**
Applications (N)	**78**	314	86	144	118	64
Coordinators						
ARWU	**418,4**	**0,9**	**0,7**	**1,2**	**0,9**	**1,05**
Centrality	**0,17**	**1,14**	**1,25**	**0,83**	**0,83**	**0,82**
EU funding per application	**124007,5**	**0,76**	**0,72**	**0,68**	**0,65**	**0,81**
EU funding per project	**332253,7**	**0,88**	**0,85**	**0,73**	**0,84**	**1,24**
Mean number of applications	**35,92**	**1,27**	**1,27**	**0,97**	**1,04**	**1,14**
Mean number of projects	**10,19**	**1,25**	**1,38**	**0,85**	**0,83**	**0,66**
MNCS	**0,91**	**1,04**	**1,18**	**0,92**	**1,05**	**0,66**
Publications	**2194,68**	**1,53**	**1,75**	**1,25**	**1,37**	**0,66**
Success rate	**0,30**	**0,80**	**0,80**	**0,71**	**0,67**	**0,88**
Partners						
ARWU	**433,8**	**1,1**	**1,0**	**1,2**	**1,1**	**0,82**
Centrality	**0,11**	**0,88**	**0,95**	**0,76**	**0,50**	**0,53**
EU funding per application	**68465,5**	**0,87**	**0,88**	**0,74**	**0,61**	**0,91**
EU funding per project	**179756,4**	**0,87**	**0,89**	**0,77**	**0,64**	**0,61**
Mean number of applications	**24,41**	**0,93**	**0,98**	**0,85**	**0,57**	**0,64**
Mean number of projects	**6,80**	**0,90**	**0,97**	**0,78**	**0,47**	**0,55**
MNCS	**0,88**	**0,96**	**1,03**	**0,92**	**0,96**	**0,75**
Publications	**2766,73**	**0,95**	**1,04**	**0,79**	**0,93**	**0,92**
Success rate	**0,28**	**0,91**	**0,91**	**0,80**	**0,70**	**0,57**

A.18 Environment (including Climate Change)				
REC, Coordination & support action	AT	NL	**NO**	FI
Success rate	41,38	39,68	**35,48**	28,57
Partners per application	**0,84**	**1,04**	**1,00**	**1,18**
Applications (N)	29	63	**31**	28
Coordinators				
ARWU	**1,5**	**0,7**	**435,2**	**0,9**
Centrality	**0,83**	**0,69**	**0,23**	**0,71**
EU funding per application	**0,86**	**1,27**	**88172,1**	**0,87**
EU funding per project	**0,93**	**0,99**	**278596,6**	**0,92**
Mean number of applications	**0,82**	**0,51**	**60,45**	**0,64**
Mean number of projects	**0,84**	**0,65**	**15,65**	**0,64**
MNCS	**0,84**	**1,22**	**0,90**	**1,12**
Publications	**0,68**	**2,03**	**2336,02**	**1,92**
Success rate	**0,85**	**1,13**	**0,31**	**0,83**
Partners				
ARWU	**1,2**	1,0	**398,3**	**1,0**
Centrality	**0,64**	**1,01**	**0,16**	**1,01**
EU funding per application	**0,74**	**1,08**	**62470,1**	1,00
EU funding per project	**0,76**	**0,95**	**183386,4**	**1,02**
Mean number of applications	**0,69**	**0,99**	**30,91**	**1,07**
Mean number of projects	**0,66**	**1,05**	**9,46**	**1,05**
MNCS	**0,90**	**1,02**	**0,90**	**1,03**
Publications	**0,84**	**1,03**	**3177,74**	**1,07**
Success rate	**0,96**	**1,29**	**0,29**	**0,99**

A.19 Environment (including Climate Change)						
REC, Collaborative project	**NO**	NL	SE	DK	FI	AT
Success rate	**34,21**	29,36	28,00	25,76	24,88	23,46
Partners per application	**16,7**	0,95	0,94	0,97	0,98	0,96
Applications (N)	**266**	419	50	132	205	179
Coordinators						
ARWU	**378,4**	0,9	1,2	0,9	0,9	1,0
Centrality	**0,22**	1,18	0,93	1,10	0,98	1,00
EU funding per application	**118799,0**	0,91	0,73	0,89	0,78	0,77
EU funding per project	**332948,1**	0,97	0,79	0,93	0,92	0,83
Mean number of applications	**46,34**	1,16	1,03	1,17	1,05	1,10
Mean number of projects	**13,99**	1,21	0,93	1,12	0,98	1,08
MNCS	**0,95**	1,05	0,88	1,08	1,04	1,04
Publications	**3101,00**	1,23	0,69	1,48	1,19	1,09
Success rate	**0,31**	0,91	0,78	0,98	0,84	0,84
Partners						
ARWU	**419,3**	1,0	0,9	1,0	0,9	1,1
Centrality	**0,17**	0,97	0,76	0,92	0,99	0,80
EU funding per application	**75846,9**	0,93	0,77	0,96	0,89	0,72
EU funding per project	**211707,4**	0,96	0,82	0,98	0,96	0,79
Mean number of applications	**35,26**	0,98	0,79	0,93	1,02	0,85
Mean number of projects	**10,46**	0,98	0,76	0,91	1,00	0,82
MNCS	**0,89**	0,99	1,04	0,99	1,03	0,96
Publications	**2940,30**	0,98	1,02	1,03	1,07	0,90
Success rate	**0,30**	0,89	0,80	0,95	0,85	0,78

A.20 Europe in a changing world - inclusive, innovative and reflective Societies						
HES, Research and Innovation						
action	**NO**	NL	DK	SE	FI	AT
Success rate	**9,76**	9,62	9,35	7,63	4,13	1,89
Partners per application	**10,0**	1,03	1,02	1,02	0,96	1,04
Applications (N)	**82**	208	107	131	121	106
Coordinators						
ARWU	**444,1**	0,9	0,9	1,0	1,1	1,2
Centrality	**0,13**	1,09	1,32	1,07	0,75	0,59
EU funding per application	**23716,9**	1,02	1,09	0,70	0,60	0,66
EU funding per project	**181479,2**	1,18	1,24	0,89	0,84	0,81
Mean number of applications	**17,05**	1,08	1,27	1,09	0,87	0,84
Mean number of projects	**1,18**	1,18	1,37	1,12	0,75	0,64
MNCS	**0,84**	1,09	1,07	0,98	0,96	0,92
Publications	**2495,80**	1,27	1,17	1,02	0,81	0,72
Success rate	**0,06**	1,16	1,26	1,02	0,81	0,67
Partners						
ARWU	**499,9**	1,0	1,0	1,0	1,1	1,0
Centrality	**0,10**	1,00	1,19	0,94	0,75	0,72
EU funding per application	**17967,9**	1,03	0,96	0,88	0,75	0,68
EU funding per project	**115537,4**	1,08	1,10	1,04	0,81	0,84
Mean number of applications	**12,43**	1,07	1,17	1,06	0,97	1,02
Mean number of projects	**0,99**	1,06	1,17	0,98	0,74	0,78
MNCS	**0,77**	1,05	1,03	1,01	0,94	1,00
Publications	**2435,28**	1,09	1,02	0,96	0,84	0,93
Success rate	**0,08**	1,01	1,06	0,90	0,77	0,55

A.21 Europe in a changing world - inclusive, innovative and reflective Societies						
PRC, Total	FI	SE	NL	AT	**NO**	DK
Success rate	13,64	13,51	5,68	4,94	**4,55**	4,35
Partners per application	0,96	0,66	0,98	0,91	**11,4**	0,96
Applications (N)	22	37	88	81	**22**	23
Coordinators						
ARWU	1,0	0,9	0,7	0,9	534,7	0,8
Centrality	2,71	2,20	3,13	2,71	0,04	2,03
EU funding per application	0,82	1,12	0,78	0,49	20196,9	0,81
EU funding per project	0,86	0,60	0,83	0,52	184087,2	0,94
Mean number of applications	2,09	2,07	2,57	2,32	6,36	2,47
Mean number of projects	2,50	2,13	3,53	2,78	0,36	2,27
MNCS	0,94	1,01	1,18	1,02	0,80	1,06
Publications	1,13	1,34	1,89	1,55	1733,25	1,77
Success rate	1,06	1,67	1,07	1,12	0,04	1,15
Partners						
ARWU	1,0	0,9	0,9	0,9	602,9	1,0
Centrality	1,20	1,24	1,20	1,18	0,04	1,14
EU funding per application	1,79	1,49	1,15	1,20	11174,0	0,80
EU funding per project	1,28	1,05	1,09	1,10	57967,9	0,97
Mean number of applications	0,99	1,00	1,04	1,01	7,13	0,87
Mean number of projects	1,17	1,14	1,14	1,10	0,45	1,00
MNCS	1,02	1,14	1,13	1,06	0,66	1,04
Publications	1,00	1,21	1,27	1,15	1625,26	0,93
Success rate	2,18	2,05	1,33	1,45	0,04	1,09

A.22 Europe in a changing world - inclusive, innovative and reflective Societies REC, Research and Innovation				
action	FI	AT	**NO**	NL
Success rate	12,50	8,22	**4,88**	4,00
Partners per application	1,11	1,04	10,0	1,03
Applications (N)	24	73	**41**	
Coordinators				
ARWU	1,0	1,3	399,0	1,0
Centrality	1,30	0,90	0,10	1,48
EU funding per application	1,00	0,69	28800,0	0,72
EU funding per project	0,87	0,69	212021,0	0,77
Mean number of applications	1,19	1,00	13,15	1,39
Mean number of projects	1,45	0,93	0,98	1,53
MNCS	0,98	0,91	0,88	1,03
Publications	0,94	0,85	2484,74	1,36
Success rate	0,94	0,83	0,08	0,76
Partners				
ARWU	1,0	1,0	513,4	1,0
Centrality	0,95	1,04	0,09	0,88
EU funding per application	1,44	1,66	13121,5	1,21
EU funding per project	1,15	1,16	89864,1	1,02
Mean number of applications	0,95	1,06	11,03	0,92
Mean number of projects	1,08	1,19	0,80	0,99
MNCS	0,96	0,98	0,76	0,96
Publications	0,81	0,95	2342,65	0,95
Success rate	1,11	1,06	0,09	0,84

A.23 Future and Emerging Technologies (H2020) HES, Research and Innovation action	AT	SE	FI	DK	NL	NO
Success rate	8,02	6,31	4,67	4,32	3,31	**2,00**
Partners per application	**0,98**	**0,90**	**0,97**	**0,94**	**0,95**	**6,8**
Applications (N)	162	222	107	139	302	**50**
Coordinators						
ARWU	**1,2**	**1,1**	**1,5**	**1,0**	**1,0**	**342,5**
Centrality	**1,61**	**1,17**	**1,29**	**1,53**	**1,57**	**0,21**
EU funding per application	**1,70**	**1,41**	**1,20**	**1,44**	1,00	**19877,8**
EU funding per project	**1,44**	**1,05**	**1,04**	**1,28**	**1,05**	**251523,9**
Mean number of applications	**1,30**	**1,19**	**0,92**	**1,44**	**1,43**	**27,12**
Mean number of projects	**1,43**	**1,14**	**1,03**	**1,35**	**1,24**	**1,44**
MNCS	**1,03**	**0,99**	**0,89**	**1,09**	**1,07**	**0,92**
Publications	**0,76**	**0,89**	**0,61**	**0,91**	**1,03**	**3299,99**
Success rate	**1,49**	**1,16**	**1,28**	**1,26**	**0,99**	**0,04**
Partners						
ARWU	**1,0**	**0,9**	**1,0**	**0,8**	**0,8**	**380,9**
Centrality	**1,53**	**1,49**	**1,53**	**1,39**	**1,55**	**0,17**
EU funding per application	**1,84**	**1,64**	**1,39**	**1,58**	**1,30**	**17374,3**
EU funding per project	**1,42**	**1,30**	**1,18**	**1,46**	**1,26**	**197087,7**
Mean number of applications	**1,09**	**1,09**	**1,17**	**1,11**	**1,18**	**25,04**
Mean number of projects	**1,44**	**1,37**	**1,43**	**1,29**	**1,31**	**1,19**
MNCS	**1,07**	**1,07**	**1,06**	**1,17**	**1,15**	**0,90**
Publications	**0,96**	**1,14**	**1,06**	**1,23**	**1,24**	**3145,30**
Success rate	**1,90**	**1,69**	**1,50**	**1,41**	**1,28**	**0,04**

A.24 Future and Emerging Technologies (H2020) PRC, Research and Innovation action	AT	NL	FI	SE	NO	DK
Success rate	6,98	4,60	4,00	3,23	**0,00**	0,00
Partners per application	**0,94**	**0,95**	**1,03**	**0,77**	**7,3**	**0,87**
Applications (N)	43	87	25	31	**20**	23
Coordinators						
ARWU	**0,8**	**0,7**	**0,9**	**0,7**	**476,5**	**0,6**
Centrality	**2,79**	**2,36**	**2,92**	**2,39**	**0,10**	**1,33**
EU funding per application	**2,33**	**1,28**	**0,65**	**0,59**	**9343,0**	**1,30**
EU funding per project	**1,75**	**1,20**	**1,02**	**0,81**	**192473,4**	**1,44**
Mean number of applications	**1,60**	**1,51**	**2,08**	**1,47**	**17,55**	**1,31**
Mean number of projects	**1,74**	**1,43**	**1,32**	**0,50**	**1,00**	**1,26**
MNCS	**1,08**	**1,18**	**1,10**	**1,10**	**0,87**	**1,25**
Publications	**1,10**	**1,26**	**1,09**	**1,36**	**2759,90**	**1,35**
Success rate	**1,72**	**1,08**	**0,96**	**0,60**	**0,04**	**1,12**
Partners						
ARWU	**0,9**	**0,8**	**0,9**	**0,8**	**469,5**	**0,7**
Centrality	**1,02**	**0,95**	**1,03**	**0,94**	**0,17**	**0,86**
EU funding per application	**2,32**	**3,78**	**2,35**	**3,11**	**17953,2**	**1,64**
EU funding per project	**1,27**	**1,41**	**1,46**	**1,25**	**133513,9**	**1,19**
Mean number of applications	**0,84**	**0,80**	**0,94**	**0,61**	**22,40**	1,00
Mean number of projects	**1,10**	**1,02**	**1,25**	**0,71**	**1,04**	**1,01**
MNCS	**1,09**	**1,15**	**1,03**	**1,11**	**0,85**	**1,22**
Publications	**1,06**	**1,39**	**1,34**	**1,22**	**2508,60**	**1,50**
Success rate	**2,70**	**3,42**	**2,81**	**3,26**	**0,02**	**1,53**

A.25 Future and Emerging Technologies REC, Research and Innovation action	FI	NL	AT	NO		
Success rate	6,06	3,90	1,72	0,00		
Partners per application	0,93	0,99	1,05	6,9		
Applications (N)	33	77	58	21		
Coordinators						
ARWU	1,2	1,1	1,0	375,4		
Centrality	9,23	3,37	5,08	0,05		
EU funding per application	9,00	3,91	8,43	31280,5		
EU funding per project	6,79	3,98	6,31	44643,6		
Mean number of applications	2,04	1,76	1,52	13,57		
Mean number of projects	3,39	2,39	3,74	0,43		
MNCS	1,08	1,02	1,10	0,89		
Publications	0,94	1,09	1,01	2594,65		
Success rate	2,61	1,51	3,03	0,02		
Partners						
ARWU	0,9	0,9	1,0	400,4		
Centrality	1,64	1,07	1,07	0,17		
EU funding per application	2,00	1,59	1,47	13726,8		
EU funding per project	1,56	1,12	0,99	171301,0		
Mean number of applications	1,06	0,80	0,75	24,56		
Mean number of projects	1,15	0,84	0,72	1,41		
MNCS	1,00	1,05	0,97	0,94		
Publications	1,28	1,18	1,02	3017,27		
Success rate	1,84	1,55	1,39	0,03		

A.26 Health HES, Collaborative project	NL	NO	AT	SE	FI	DK
Success rate	34,12	29,09	27,13	26,22	25,33	25,08
Partners per application	0,97	12,3	1,08	0,87	0,93	0,87
Applications (N)	548	165	376	900	304	315
Coordinators						
ARWU	1,0	249,8	1,4	1,0	1,2	1,1
Centrality	1,16	0,22	0,94	1,39	1,08	1,03
EU funding per application	1,02	170568,5	0,84	0,94	0,86	0,82
EU funding per project	1,03	478556,0	0,94	1,01	1,04	1,01
Mean number of applications	1,08	95,52	0,99	1,53	1,07	1,02
Mean number of projects	1,16	29,66	0,89	1,49	1,05	0,98
MNCS	1,04	1,07	0,93	0,97	0,97	0,97
Publications	0,98	4551,26	0,70	1,00	0,88	0,95
Success rate	1,12	0,27	0,92	1,01	0,98	0,97
Partners						
ARWU	1,0	317,3	1,2	1,0	1,1	0,9
Centrality	1,06	0,16	0,99	1,15	1,03	1,04
EU funding per application	1,07	122265,5	0,94	1,04	0,95	1,04
EU funding per project	1,02	359788,6	0,95	1,03	0,99	1,04
Mean number of applications	1,04	66,65	1,01	1,21	1,05	1,04
Mean number of projects	1,09	20,44	0,99	1,22	1,05	1,05
MNCS	1,04	0,99	0,97	1,00	0,98	1,03
Publications	1,09	3849,90	0,90	1,07	0,96	1,09
Success rate	1,05	0,30	0,95	0,98	0,92	0,98

A.27 Health						
PRC, Collaborative project	AT	SE	DK	FI	NL	**NO**
Success rate	29,44	29,20	28,35	25,56	24,94	**20,41**
Partners per application	**1,06**	**0,63**	**0,87**	**0,94**	**0,96**	**12,10**
Applications (N)	197	274	194	133	449	**49**
Coordinators						
ARWU	**1,5**	**1,4**	**1,1**	**1,4**	**1,3**	**201,5**
Centrality	**1,24**	**1,12**	**1,10**	**1,05**	**1,18**	**0,19**
EU funding per application	**0,59**	**0,59**	**0,68**	**0,62**	**0,64**	**256568,2**
EU funding per project	**0,91**	**0,88**	1,00	**1,02**	**0,93**	**504208,6**
Mean number of applications	**1,24**	**1,17**	**1,07**	**1,06**	**1,11**	**87,81**
Mean number of projects	**1,18**	**1,14**	**1,05**	**1,06**	**1,14**	**26,72**
MNCS	**0,91**	**0,91**	**0,97**	**0,93**	**0,95**	**1,12**
Publications	**0,73**	**0,80**	**0,98**	**0,84**	**0,89**	**5099,62**
Success rate	**0,96**	**0,90**	**0,99**	**0,90**	**1,01**	**0,27**
Partners						
ARWU	**1,2**	**1,0**	**0,9**	**1,1**	1,0	**306,8**
Centrality	**1,09**	1,00	**1,14**	**1,02**	**1,12**	**0,14**
EU funding per application	**0,98**	**1,09**	**1,09**	**0,94**	**1,02**	**124445,5**
EU funding per project	**0,97**	**1,02**	**1,05**	**0,96**	**1,01**	**353408,3**
Mean number of applications	**1,08**	1,00	**1,13**	**1,02**	**1,11**	**57,78**
Mean number of projects	**1,08**	**1,01**	**1,17**	**1,03**	**1,14**	**17,48**
MNCS	**0,95**	1,00	**1,03**	**0,94**	**1,01**	**1,01**
Publications	**0,86**	**1,01**	**1,03**	**0,90**	1,00	**4129,33**
Success rate	**1,04**	**1,07**	**1,05**	1,00	**1,03**	**0,27**

A.28 Health						
REC, Collaborative project	FI	AT	**NO**	NL	DK	SE
Success rate	35,71	28,28	**26,87**	25,74	21,11	19,05
Partners per application	**1,05**	**1,03**	**13,5**	**0,80**	**0,84**	**1,13**
Applications (N)	168	145	**134**	1154	199	21
Coordinators						
ARWU	**1,0**	**1,3**	**267,5**	**1,0**	1,0	**0,8**
Centrality	**1,03**	**0,76**	**0,24**	**1,12**	**0,92**	**1,27**
EU funding per application	**0,96**	**0,89**	**167353,6**	**0,94**	**0,83**	**0,83**
EU funding per project	**0,98**	**0,88**	**484588,9**	**0,98**	**0,87**	**0,95**
Mean number of applications	**0,99**	**0,76**	**105,78**	**1,10**	**0,94**	**1,40**
Mean number of projects	**1,03**	**0,74**	**31,92**	**1,11**	**0,93**	**1,39**
MNCS	**0,95**	**0,93**	**1,08**	**0,98**	**0,96**	**1,02**
Publications	**1,04**	**0,81**	**4487,76**	**0,97**	**0,99**	**0,95**
Success rate	**1,05**	**0,93**	**0,28**	**0,97**	**0,92**	**0,96**
Partners						
ARWU	1,0	**1,0**	**356,4**	**0,9**	1,0	**1,1**
Centrality	**1,01**	**0,90**	**0,15**	**1,21**	**0,95**	**0,95**
EU funding per application	**1,09**	**1,07**	**102633,2**	**1,24**	**1,05**	**0,96**
EU funding per project	**1,05**	**1,03**	**305912,3**	**1,19**	**1,03**	**0,98**
Mean number of applications	**0,96**	**0,87**	**61,17**	**1,22**	**0,95**	**0,99**
Mean number of projects	**0,99**	**0,87**	**18,57**	**1,25**	**0,95**	1,00
MNCS	**1,01**	1,00	**0,94**	**1,05**	**1,02**	**0,97**
Publications	1,00	**0,95**	**3642,95**	**1,10**	**0,98**	**0,90**
Success rate	**1,14**	**1,07**	**0,27**	**1,08**	**0,97**	**0,85**

A.29 Health, demographic change and wellbeing HES, Research and Innovation action	NO	DK	AT	SE	NL	FI
Success rate	**9,77**	9,57	8,62	8,46	8,41	5,19
Partners per application	**10,9**	0,93	1,08	0,90	0,92	0,89
Applications (N)	**133**	230	232	473	547	270
Coordinators						
ARWU	**365,2**	0,8	1,1	0,8	0,8	1,1
Centrality	**0,19**	1,13	0,87	1,37	1,23	0,89
EU funding per application	**47358,7**	1,11	1,08	1,13	1,12	0,85
EU funding per project	**443533,4**	1,00	0,95	0,99	1,06	0,82
Mean number of applications	**51,36**	0,99	0,86	1,20	1,22	0,87
Mean number of projects	**5,02**	1,10	0,86	1,40	1,25	0,88
MNCS	**0,95**	1,10	1,00	1,07	1,14	0,99
Publications	**3385,86**	1,26	0,94	1,24	1,25	0,95
Success rate	**0,07**	1,26	1,10	1,22	1,21	1,04
Partners						
ARWU	**367,4**	0,9	1,0	0,9	0,9	1,0
Centrality	**0,12**	1,17	1,07	1,33	1,14	0,99
EU funding per application	**42308,4**	1,15	1,04	1,11	1,12	0,89
EU funding per project	**284920,4**	1,01	1,02	1,05	1,08	0,90
Mean number of applications	**30,50**	1,05	1,01	1,21	1,12	0,98
Mean number of projects	**3,11**	1,12	1,02	1,33	1,14	0,98
MNCS	**0,93**	1,06	1,01	1,05	1,08	1,00
Publications	**3445,72**	1,16	0,94	1,16	1,13	1,00
Success rate	**0,10**	1,20	1,01	1,08	1,06	0,85

A.30 Health, demographic change and wellbeing PRC, Research and Innovation action	NL	FI	AT	DK	SE	NO
Success rate	10,75	7,26	6,40	5,37	4,65	**0,00**
Partners per application	1,08	1,15	1,17	1,06	0,73	**9,64**
Applications (N)	465	124	125	149	172	**36**
Coordinators						
ARWU	1,1	1,5	1,4	1,2	1,1	**280,1**
Centrality	1,55	1,25	1,29	1,38	1,49	**0,12**
EU funding per application	2,03	1,33	1,47	1,43	1,51	**32313,3**
EU funding per project	1,19	0,89	1,19	0,98	0,98	**359593,3**
Mean number of applications	1,42	1,18	1,25	1,16	1,34	**34,58**
Mean number of projects	1,57	1,26	1,28	1,31	1,58	**3,28**
MNCS	1,02	0,87	0,94	1,02	1,00	**1,00**
Publications	1,07	0,77	0,85	1,00	1,02	**3846,61**
Success rate	1,58	1,42	1,40	1,58	1,57	**0,06**
Partners						
ARWU	0,9	1,1	1,1	0,9	1,0	**388,6**
Centrality	1,30	1,08	1,10	1,19	1,02	**0,09**
EU funding per application	1,95	1,61	1,43	1,39	1,36	**23361,1**
EU funding per project	1,21	0,99	0,97	1,04	0,96	**218411,8**
Mean number of applications	1,13	0,93	0,99	1,00	0,94	**24,48**
Mean number of projects	1,27	1,03	1,06	1,15	1,01	**2,27**
MNCS	1,04	0,92	0,95	1,02	0,98	**0,94**
Publications	1,05	0,83	0,86	1,06	0,97	**3570,26**
Success rate	2,11	1,73	1,60	1,51	1,45	**0,05**

A.31 Health, demographic change and wellbeing REC, Research and Innovation action	AT	FI	NL	DK	NO
Success rate	12,20	12,10	10,19	8,75	**7,08**
Partners per application	**0,89**	**0,87**	**0,81**	**1,02**	12,60
Applications (N)	123	124	667	80	**113**
Coordinators					
ARWU	**1,2**	**1,2**	**1,0**	**1,1**	285,7
Centrality	**0,92**	**1,12**	**1,45**	**1,04**	0,19
EU funding per application	**0,77**	**0,93**	**1,10**	**1,61**	68822,4
EU funding per project	**0,90**	**0,93**	**1,10**	**1,09**	450443,6
Mean number of applications	**0,92**	**1,07**	**1,31**	**0,91**	48,47
Mean number of projects	**0,94**	**1,09**	**1,42**	1,00	5,10
MNCS	**0,94**	**0,94**	**1,01**	**0,93**	1,05
Publications	**0,83**	**0,90**	**1,11**	**0,96**	4200,38
Success rate	**0,99**	**1,13**	**1,08**	**1,38**	0,09
Partners					
ARWU	**1,1**	**1,0**	**0,9**	**0,8**	360,4
Centrality	**0,92**	**1,21**	**1,36**	**1,18**	0,11
EU funding per application	**1,38**	**1,26**	**1,47**	**1,42**	34777,0
EU funding per project	**1,09**	**1,13**	**1,31**	**1,24**	241049,8
Mean number of applications	**0,92**	**1,09**	**1,27**	**1,07**	28,00
Mean number of projects	**0,95**	**1,21**	**1,38**	**1,16**	2,86
MNCS	**0,97**	**1,01**	**1,04**	**1,09**	0,95
Publications	**0,89**	**1,02**	**1,05**	**1,16**	3714,54
Success rate	**1,21**	**1,41**	**1,37**	**1,25**	0,08

A.32 Industrial Leadership HES, Research and Innovation action	AT	NL	DK	SE	NO	FI
Success rate	22,92	17,07	7,41	6,17	**4,55**	1,96
Partners per application	**0,91**	**0,81**	**0,70**	**0,82**	12,50	**0,85**
Applications (N)	48	82	54	81	**22**	51
Coordinators						
ARWU	**1,3**	**0,7**	**0,6**	**0,8**	467,0	**1,2**
Centrality	**1,64**	**1,52**	**1,08**	**2,40**	0,06	**0,99**
EU funding per application	**1,98**	**2,01**	**1,65**	**1,38**	68813,3	**0,55**
EU funding per project	**1,01**	**1,09**	**1,13**	**1,12**	405237,7	**0,99**
Mean number of applications	**1,58**	**1,50**	**1,35**	**2,60**	20,00	**1,23**
Mean number of projects	**1,71**	**1,51**	**1,15**	**2,51**	2,59	**1,04**
MNCS	**0,89**	**1,28**	**1,29**	**1,08**	0,84	**0,90**
Publications	**0,68**	**1,62**	**1,70**	**1,42**	2102,64	**0,79**
Success rate	**1,30**	**1,45**	**1,37**	**1,17**	0,11	**0,58**
Partners						
ARWU	**1,0**	**0,8**	**0,8**	**0,9**	465,0	**1,0**
Centrality	**1,07**	**1,24**	**0,95**	**1,14**	0,04	**0,94**
EU funding per application	**1,96**	**1,78**	**1,29**	**1,18**	41228,8	**0,91**
EU funding per project	**1,20**	**1,15**	**1,06**	**1,11**	215657,9	1,00
Mean number of applications	**0,90**	**1,04**	**1,07**	**1,03**	15,44	**1,02**
Mean number of projects	1,00	**1,12**	**0,95**	**1,04**	2,01	**0,92**
MNCS	**1,04**	**1,16**	**1,16**	**1,05**	0,84	**1,02**
Publications	**0,91**	**1,26**	**1,29**	**1,10**	2546,83	**0,99**
Success rate	**2,36**	**2,15**	**1,18**	**1,54**	0,08	**0,98**

A.33 Industrial Leadership PRC, Research and Innovation action	NO	FI	NL	AT	SE	DK
Success rate	**16,00**	15,94	14,45	11,61	11,39	8,93
Partners per application	12,30	0,99	0,88	0,89	0,76	0,86
Applications (N)	**50**	69	173	112	79	56
Coordinators						
ARWU	**445,9**	1,2	0,9	1,2	1,0	1,0
Centrality	**0,16**	0,87	0,94	0,99	0,22	0,77
EU funding per application	**90063,5**	0,71	1,16	1,07	0,47	0,64
EU funding per project	**488044,4**	0,74	0,80	0,82	0,69	0,62
Mean number of applications	**57,80**	0,93	0,97	1,01	0,31	0,88
Mean number of projects	**7,90**	0,88	0,94	0,98	0,21	0,77
MNCS	**0,98**	0,87	0,96	0,84	0,93	0,95
Publications	**2359,60**	0,77	1,22	0,86	1,22	1,29
Success rate	**0,13**	0,90	1,05	1,11	0,60	0,85
Partners						
ARWU	**476,1**	1,1	0,9	1,0	1,0	0,9
Centrality	**0,04**	1,15	1,09	0,96	0,45	0,99
EU funding per application	**61409,3**	0,92	1,05	0,97	0,79	0,76
EU funding per project	**223980,7**	0,99	0,96	0,92	0,76	0,89
Mean number of applications	**14,71**	1,16	1,15	1,09	0,49	1,16
Mean number of projects	**2,04**	1,19	1,13	1,01	0,43	1,04
MNCS	**0,84**	1,01	1,09	1,04	1,04	1,07
Publications	**2643,83**	0,88	1,14	0,96	0,96	1,04
Success rate	**0,15**	1,01	1,03	0,90	0,86	0,74

A.34 Industrial Leadership PRC, Innovation action	SE	AT	FI	NO	DK	NL
Success rate	21,67	20,69	16,36	**13,64**	9,80	9,23
Partners per application	0,77	0,85	0,87	14,77	0,83	0,89
Applications (N)	60	87	55	**22**	51	130
Coordinators						
ARWU	1,2	1,1	1,5	352,3	0,9	1,1
Centrality	0,49	2,10	2,11	0,07	1,19	1,46
EU funding per application	0,92	1,24	0,84	88360,9	0,77	1,00
EU funding per project	0,65	0,75	0,67	607685,8	0,67	0,63
Mean number of applications	0,48	2,49	2,44	23,05	1,40	1,55
Mean number of projects	0,52	2,39	2,44	3,05	1,35	1,60
MNCS	0,98	1,12	0,89	0,92	1,18	1,07
Publications	0,83	0,81	0,54	3287,86	1,07	1,02
Success rate	1,33	1,60	1,34	0,09	1,14	1,33
Partners						
ARWU	1,2	1,2	1,2	435,2	1,0	1,1
Centrality	0,43	0,94	1,10	0,06	0,86	0,90
EU funding per application	1,26	1,43	1,20	51083,3	0,94	0,86
EU funding per project	0,94	1,18	1,15	196219,9	1,03	1,00
Mean number of applications	0,35	0,99	1,20	18,77	1,00	0,99
Mean number of projects	0,36	1,03	1,21	2,51	0,94	0,95
MNCS	0,89	0,92	0,92	0,90	0,99	0,96
Publications	0,92	0,95	0,89	2342,75	1,15	1,06
Success rate	1,14	0,99	0,90	0,17	0,60	0,65

A.35 Industrial Leadership REC, Innovation action	AT	NO	FI	NL	DK
Success rate	21,88	**12,90**	11,11	10,81	10,71
Partners per application	**1,01**	12,81	**0,95**	**0,79**	**0,94**
Applications (N)	32	**31**	54	37	28
Coordinators					
ARWU	**1,2**	**340,0**	**1,5**	**0,9**	**1,4**
Centrality	**1,68**	**0,09**	**1,75**	**1,43**	**0,87**
EU funding per application	**1,69**	**76738,3**	**0,87**	**1,79**	**1,34**
EU funding per project	**0,89**	**475375,5**	**0,81**	**0,79**	**0,93**
Mean number of applications	**1,63**	**31,84**	**1,76**	**1,03**	**1,06**
Mean number of projects	**1,66**	**4,19**	**1,82**	**1,28**	**0,84**
MNCS	**0,88**	**0,99**	**0,78**	**1,07**	**0,98**
Publications	**0,79**	**3939,97**	**0,46**	**0,87**	**0,46**
Success rate	**1,73**	**0,11**	**1,24**	**1,50**	**1,20**
Partners					
ARWU	**1,2**	**412,2**	**1,3**	**1,0**	**1,0**
Centrality	1,00	**0,05**	**1,28**	**1,27**	**1,14**
EU funding per application	1,00	**62574,8**	**0,82**	**1,05**	**0,81**
EU funding per project	**0,85**	**255035,1**	**0,86**	**1,01**	**0,85**
Mean number of applications	**1,05**	**18,30**	**1,32**	**1,06**	**1,15**
Mean number of projects	**1,03**	**2,47**	**1,33**	**1,22**	**1,13**
MNCS	**0,95**	**0,92**	**0,85**	**0,95**	**0,96**
Publications	**0,77**	**3075,47**	**0,61**	**0,95**	**0,96**
Success rate	**1,13**	**0,15**	**0,94**	**1,14**	**0,97**

A.36 Industrial Leadership REC, Research and Innovation action	NL	NO	FI	DK	AT
Success rate	18,03	**15,79**	8,47	7,69	6,25
Partners per application	**0,84**	13,4	**0,87**	**0,98**	**0,88**
Applications (N)	61	**38**	59	26	48
Coordinators					
ARWU	**1,6**	**354,8**	**1,4**	**1,2**	**1,5**
Centrality	**0,73**	**0,13**	**1,35**	**0,32**	**1,40**
EU funding per application	**1,47**	**84795,4**	**0,74**	**0,45**	**0,72**
EU funding per project	**0,70**	**534633,8**	**0,76**	**0,56**	**0,61**
Mean number of applications	**0,42**	**47,47**	**1,40**	**0,47**	**1,43**
Mean number of projects	**0,60**	**6,29**	**1,39**	**0,31**	**1,40**
MNCS	**0,80**	**1,05**	**0,84**	**0,83**	**0,76**
Publications	**0,55**	**3111,35**	**0,71**	**0,83**	**0,73**
Success rate	**1,65**	**0,11**	**1,07**	**0,61**	**1,01**
Partners					
ARWU	**0,9**	**465,5**	**1,0**	**1,0**	**0,9**
Centrality	**1,11**	**0,06**	**0,98**	**1,01**	**0,74**
EU funding per application	**1,16**	**62227,6**	**0,74**	**0,59**	**0,75**
EU funding per project	**0,97**	**246001,7**	**0,88**	**0,78**	**0,80**
Mean number of applications	**0,89**	**19,02**	**1,07**	**1,10**	**0,80**
Mean number of projects	**1,03**	**2,62**	**1,05**	**0,99**	**0,77**
MNCS	**1,07**	**0,87**	**0,99**	**0,98**	**1,03**
Publications	**1,10**	**2492,64**	**1,01**	**1,14**	**1,10**
Success rate	**1,39**	**0,15**	**0,76**	**0,78**	**0,75**

A.37 Industrial Leadership - ICT HES, Research and Innovation action	NO	DK	AT	SE	NL	FI
Success rate	**13,21**	11,34	10,00	9,54	9,00	7,14
Partners per application	**8,64**	**1,07**	**1,12**	**1,07**	**1,06**	**1,12**
Applications (N)	**53**	97	150	262	311	168
Coordinators						
ARWU	**498,8**	**0,9**	**1,0**	**0,9**	**0,8**	1,0
Centrality	**0,09**	**0,87**	**1,41**	**0,96**	**1,17**	**1,26**
EU funding per application	**76067,8**	**0,98**	**0,84**	**1,01**	**0,75**	**0,79**
EU funding per project	**366902,3**	**1,07**	1,00	**1,12**	**1,01**	**0,89**
Mean number of applications	**39,75**	**0,83**	**1,55**	**1,01**	**1,25**	**1,28**
Mean number of projects	**6,43**	**0,80**	**1,44**	**0,99**	**1,09**	**1,20**
MNCS	**0,80**	**1,08**	**1,05**	**1,09**	**1,22**	**1,06**
Publications	**2028,41**	**1,05**	**1,04**	**1,25**	**1,38**	**1,07**
Success rate	**0,15**	**0,92**	**0,81**	**0,90**	**0,78**	**0,75**
Partners						
ARWU	**448,7**	**1,0**	**1,1**	**0,9**	**0,9**	**1,2**
Centrality	**0,04**	**1,34**	**1,47**	**1,37**	**1,32**	**1,29**
EU funding per application	**48846,7**	**1,25**	**1,21**	**1,14**	**1,05**	**0,94**
EU funding per project	**226953,1**	**1,25**	**1,30**	**1,25**	**1,16**	**1,04**
Mean number of applications	**20,10**	**1,37**	**1,48**	**1,40**	**1,38**	**1,34**
Mean number of projects	**3,15**	**1,29**	**1,43**	**1,40**	**1,28**	**1,24**
MNCS	**0,82**	**1,10**	**1,06**	**1,08**	**1,15**	**0,99**
Publications	**2544,20**	**1,10**	**0,85**	**1,08**	**1,18**	**0,86**
Success rate	**0,13**	**0,97**	**0,99**	**0,94**	**0,92**	**0,80**

A.38 Industrial Leadership - ICT PRC, Research and Innovation action	FI	SE	AT	DK	NL	NO
Success rate	13,67	11,72	10,85	10,58	10,34	**9,52**
Partners per application	**1,12**	**0,88**	**1,05**	**1,07**	**1,03**	**9,11**
Applications (N)	139	145	212	104	377	**63**
Coordinators						
ARWU	**1,0**	**1,0**	**1,0**	**0,9**	**0,9**	**501,1**
Centrality	**1,65**	**0,82**	**1,70**	**1,64**	**1,45**	**0,08**
EU funding per application	**0,84**	**0,84**	**0,77**	**0,93**	**0,77**	**89578,3**
EU funding per project	**0,86**	**0,87**	**0,89**	**0,90**	**0,88**	**450070,8**
Mean number of applications	**1,62**	**0,82**	**1,89**	**1,80**	**1,62**	**33,10**
Mean number of projects	**1,60**	**0,85**	**1,83**	**1,73**	**1,52**	**5,33**
MNCS	**1,09**	**1,04**	**1,04**	**1,10**	**1,15**	**0,82**
Publications	**1,11**	**1,06**	**1,05**	**1,18**	**1,27**	**1987,51**
Success rate	**0,93**	**1,03**	**0,95**	**1,01**	**0,90**	**0,14**
Partners						
ARWU	**1,0**	**0,9**	**1,0**	**1,0**	**0,9**	**459,8**
Centrality	**1,19**	**0,77**	**1,22**	**1,15**	**1,08**	**0,05**
EU funding per application	**1,08**	**0,99**	**0,99**	**0,99**	**1,01**	**57300,1**
EU funding per project	**1,09**	**1,03**	**1,14**	**1,13**	**1,08**	**242185,5**
Mean number of applications	**1,12**	**0,69**	**1,15**	**1,14**	**1,06**	**25,23**
Mean number of projects	**1,12**	**0,71**	**1,14**	**1,10**	**1,05**	**3,98**
MNCS	**1,02**	**1,09**	**1,04**	**1,07**	**1,10**	**0,82**
Publications	**0,95**	**1,11**	**0,98**	**1,01**	**1,11**	**2551,88**
Success rate	**1,05**	**0,98**	**0,89**	**0,93**	**0,96**	**0,14**

A.39 Industrial Leadership - ICT						
PRC, Innovation action	**NO**	SE	DK	FI	AT	NL
Success rate	**26,09**	18,37	17,24	16,67	15,28	15,05
Partners per application	**10,09**	**0,70**	**0,90**	**0,97**	**0,94**	**0,91**
Applications (N)	**23**	49	29	36	72	93
Coordinators						
ARWU	**437,9**	**1,1**	**0,8**	**1,3**	**1,1**	**1,0**
Centrality	**0,08**	**0,66**	**1,57**	**1,66**	**1,30**	**1,15**
EU funding per application	**109562,2**	**0,55**	**0,78**	**0,52**	**0,60**	**0,75**
EU funding per project	**424657,6**	**0,66**	**1,10**	**0,76**	**0,72**	**0,96**
Mean number of applications	**29,96**	**0,84**	**1,68**	**1,88**	**1,47**	**1,25**
Mean number of projects	**5,52**	**0,71**	**1,49**	**1,65**	**1,28**	**1,07**
MNCS	**0,91**	**0,96**	**1,08**	**0,76**	**0,97**	**0,98**
Publications	**2493,49**	**0,90**	**1,19**	**0,52**	**0,91**	**0,99**
Success rate	**0,22**	**0,60**	**0,62**	**0,49**	**0,61**	**0,59**
Partners						
ARWU	**529,3**	**0,9**	**0,8**	1,0	1,0	**0,9**
Centrality	**0,04**	**0,44**	**1,08**	**0,85**	**0,87**	**1,01**
EU funding per application	**64269,6**	**0,67**	**0,73**	**0,74**	**0,81**	**0,83**
EU funding per project	**219294,3**	**0,71**	**0,85**	**0,77**	**0,86**	**0,87**
Mean number of applications	**17,05**	**0,60**	**1,41**	**0,98**	**1,06**	**1,22**
Mean number of projects	**3,03**	**0,47**	**1,13**	**0,83**	**0,87**	**1,02**
MNCS	**0,76**	**1,05**	**1,20**	**1,02**	**1,02**	**1,14**
Publications	**1839,78**	**1,20**	**1,75**	**1,21**	**1,08**	**1,46**
Success rate	**0,20**	**0,70**	**0,74**	**0,67**	**0,62**	**0,64**

A.40 Industrial Leadership - ICT REC, Research and Innovation action					
	FI	AT	**NO**	NL	DK
Success rate	12,75	12,12	**12,00**	11,43	8,33
Partners per application	**1,02**	**1,05**	**9,48**	**0,95**	**1,13**
Applications (N)	102	99	**75**	140	24
Coordinators					
ARWU	**0,8**	**1,0**	**517,7**	**0,8**	**0,9**
Centrality	**2,13**	1,00	**0,08**	**1,47**	**1,76**
EU funding per application	**0,65**	**0,70**	**102231,8**	**0,76**	**0,57**
EU funding per project	**0,89**	**0,73**	**450207,6**	**0,90**	**0,94**
Mean number of applications	**1,78**	**1,05**	**33,49**	**1,38**	**1,89**
Mean number of projects	**1,78**	**0,95**	**5,38**	**1,32**	**1,70**
MNCS	**1,17**	**0,98**	**0,85**	**1,15**	**1,10**
Publications	**1,28**	**1,22**	**1927,77**	**1,52**	**1,07**
Success rate	**0,68**	**0,71**	**0,17**	**0,81**	**0,44**
Partners					
ARWU	**1,0**	**1,0**	**458,2**	**1,0**	**1,1**
Centrality	**1,52**	**0,89**	**0,07**	**1,07**	**0,85**
EU funding per application	**1,21**	**1,07**	**52393,0**	**1,21**	**1,19**
EU funding per project	**1,12**	**1,04**	**266400,4**	**1,09**	**1,16**
Mean number of applications	**1,30**	**0,85**	**31,44**	**0,94**	**0,85**
Mean number of projects	**1,37**	**0,86**	**4,72**	**1,01**	**0,85**
MNCS	**1,05**	**0,97**	**0,85**	**1,05**	**0,97**
Publications	**1,03**	**0,94**	**2580,39**	**1,08**	**0,90**
Success rate	**1,19**	**1,10**	**0,12**	**1,14**	**1,07**

A.41 Industrial Leadership - Space				
REC, Total	**NO**	NL	FI	AT
Success rate	**23,81**	21,74	19,05	6,06
Partners per application	**13,48**	0,79	0,85	0,63
Applications (N)	**21**	46	42	33
Coordinators				
ARWU	**800,0**	0,5	0,5	0,4
Centrality	**0,24**	0,89	0,99	0,65
EU funding per application	**139038,4**	0,52	0,68	0,55
EU funding per project	**286167,2**	0,86	0,88	0,77
Mean number of applications	**10,62**	1,34	1,18	1,29
Mean number of projects	**2,90**	1,15	0,85	1,03
MNCS	**0,40**	2,11	2,25	2,48
Publications	**100,00**	30,07	29,08	46,73
Success rate	**0,29**	0,65	0,69	0,72
Partners				
ARWU	**405,5**	0,9	0,9	1,0
Centrality	**0,23**	0,85	0,87	0,38
EU funding per application	**61757,5**	1,01	0,87	0,37
EU funding per project	**143178,2**	1,14	1,00	0,66
Mean number of applications	**7,29**	1,37	1,25	1,13
Mean number of projects	**1,92**	1,29	1,16	0,81
MNCS	**0,94**	0,99	1,03	0,99
Publications	**2697,33**	1,17	1,25	1,15
Success rate	**0,33**	0,90	0,81	0,33

A.42 Information and Communication Technologies						
HES, Coordination & support action	DK	SE	AT	NL	FI	**NO**
Success rate	39,47	35,29	34,33	31,86	25,86	**23,08**
Partners per application	0,86	1,03	0,93	0,94	0,96	**11,23**
Applications (N)	38	102	67	113	58	**26**
Coordinators						
ARWU	1,4	1,2	1,4	1,3	1,5	**365,2**
Centrality	0,41	0,49	0,66	0,55	0,53	**0,24**
EU funding per application	0,96	1,37	1,15	1,24	0,86	**71507,9**
EU funding per project	0,91	0,96	1,04	0,96	0,78	**378671,8**
Mean number of applications	0,33	0,42	0,64	0,51	0,52	**468,08**
Mean number of projects	0,33	0,45	0,62	0,52	0,52	**86,15**
MNCS	0,78	0,88	0,82	0,88	0,87	**1,03**
Publications	0,85	0,90	0,54	0,80	0,74	**2983,98**
Success rate	1,15	1,31	1,05	1,14	0,97	**0,17**
Partners						
ARWU	1,0	0,9	1,0	1,0	1,1	**426,0**
Centrality	1,16	1,27	1,19	1,23	1,04	**0,09**
EU funding per application	1,14	1,28	1,05	1,09	1,02	**56806,6**
EU funding per project	1,05	1,14	1,02	1,03	1,00	**293334,2**
Mean number of applications	1,17	1,24	1,22	1,28	1,06	**150,70**
Mean number of projects	1,22	1,34	1,26	1,34	1,09	**26,58**
MNCS	1,04	1,05	1,01	1,05	0,96	**0,88**
Publications	1,05	1,13	0,98	1,11	0,86	**2746,32**
Success rate	1,34	1,31	1,09	1,22	1,11	**0,17**

A.43 Information and Communication Technologies						
HES, Collaborative project	AT	NL	SE	DK	FI	**NO**
Success rate	16,26	15,24	14,23	13,78	9,91	**9,22**
Partners per application	**1,07**	**0,99**	1,00	**1,01**	**1,07**	**8,67**
Applications (N)	1396	1956	1715	784	999	**412**
Coordinators						
ARWU	**1,0**	**0,9**	**1,0**	1,0	**1,2**	**422,0**
Centrality	**1,21**	**1,23**	**1,19**	**1,06**	**1,13**	**0,11**
EU funding per application	**1,03**	**1,09**	**1,12**	**1,02**	**0,99**	**67996,2**
EU funding per project	**0,97**	**1,03**	**1,04**	1,00	**0,95**	**387537,3**
Mean number of applications	**1,30**	**1,26**	**1,18**	**1,05**	**1,16**	**200,62**
Mean number of projects	**1,29**	**1,29**	**1,20**	**1,02**	**1,16**	**36,02**
MNCS	**1,03**	**1,12**	**1,03**	**1,08**	**0,97**	**0,87**
Publications	**0,90**	**1,14**	**1,01**	**0,94**	**0,84**	**2696,19**
Success rate	**1,07**	**1,13**	**1,14**	**1,08**	**1,08**	**0,15**
Partners						
ARWU	**1,0**	**0,9**	**0,9**	**0,9**	**1,1**	**439,7**
Centrality	**1,09**	**1,19**	**1,19**	**1,05**	**1,07**	**0,08**
EU funding (sum)	**1,07**	**1,20**	**1,17**	**1,01**	**1,05**	**12510861,9**
EU funding per application	**1,15**	**1,16**	**1,19**	**1,11**	**1,02**	**53529,1**
EU funding per project	**1,01**	**1,04**	**1,06**	**1,03**	**0,96**	**288960,1**
Mean number of applications	**1,06**	**1,17**	**1,13**	**1,01**	**1,04**	**150,38**
Mean number of projects	**1,11**	**1,23**	**1,19**	**1,04**	**1,09**	**26,22**
MNCS	**1,04**	**1,13**	**1,05**	**1,09**	**0,98**	**0,85**
Publications	**0,90**	**1,18**	**1,07**	**1,08**	**0,91**	**2729,26**
Success rate	**1,20**	**1,20**	**1,22**	**1,17**	**1,06**	**0,14**

A.44 Information and Communication Technologies						
PRC, Collaborative project	SE	DK	NL	FI	AT	**NO**
Success rate	18,39	17,54	17,29	16,75	16,49	**14,21**
Partners per application	**0,84**	**1,01**	**1,03**	**1,07**	**1,01**	**9,96**
Applications (N)	892	399	1660	591	1037	**380**
Coordinators						
ARWU	**0,9**	**1,0**	**0,9**	**1,1**	1,0	**456,6**
Centrality	**0,79**	**1,06**	**1,11**	**1,30**	**1,04**	**0,13**
EU funding per application	**0,96**	**0,91**	**0,99**	**0,89**	**0,99**	**83638,1**
EU funding per project	**0,91**	**0,94**	**0,93**	**0,90**	**0,92**	**411760,3**
Mean number of applications	**0,70**	**1,18**	**1,22**	**1,41**	**1,16**	**214,45**
Mean number of projects	**0,71**	**1,12**	**1,22**	**1,42**	**1,14**	**40,24**
MNCS	**1,04**	**1,07**	**1,09**	**0,98**	**1,01**	**0,87**
Publications	**1,10**	**1,02**	**1,07**	**0,88**	**0,95**	**2463,05**
Success rate	**1,03**	**0,89**	**0,98**	**0,96**	**0,98**	**0,18**
Partners						
ARWU	**0,9**	**0,9**	**0,9**	1,0	**1,0**	**474,0**
Centrality	**0,77**	**0,96**	**1,09**	**1,07**	**1,05**	**0,08**
EU funding (sum)	**0,57**	**0,94**	**1,07**	**1,02**	**1,05**	**12685082,7**
EU funding per application	**1,08**	**1,02**	**1,06**	1,00	**1,05**	**60305,4**
EU funding per project	**0,96**	**0,99**	**1,03**	**0,96**	1,00	**265226,2**
Mean number of applications	**0,63**	**0,95**	**1,08**	**1,04**	**1,06**	**138,00**
Mean number of projects	**0,66**	**0,95**	**1,10**	**1,06**	**1,06**	**25,52**
MNCS	**1,04**	**1,05**	**1,09**	**1,01**	**1,03**	**0,83**
Publications	**1,16**	**1,14**	**1,23**	**1,07**	**1,08**	**2313,99**
Success rate	**1,15**	**1,06**	**1,08**	**1,05**	**1,07**	**0,18**

A.45 Information and Communication Technologies				
PRC, Coordination & support action	NL	FI	**NO**	AT
Success rate	53,85	48,21	**29,63**	24,62
Partners per application	**1,04**	1,00	**10,81**	**0,84**
Applications (N)	65	56	**27**	65
Coordinators				
ARWU	**1,1**	**1,1**	**420,4**	**1,2**
Centrality	**1,06**	**1,38**	**0,12**	**0,70**
EU funding per application	**1,48**	**1,29**	**68704,5**	**0,90**
EU funding per project	**1,02**	**1,03**	**338812,8**	**0,82**
Mean number of applications	**1,08**	**1,60**	**201,74**	**0,81**
Mean number of projects	**1,11**	**1,54**	**40,26**	**0,72**
MNCS	**0,90**	**0,93**	**0,97**	**0,80**
Publications	**0,81**	**0,76**	**2769,96**	**0,38**
Success rate	**1,45**	**1,44**	**0,17**	**1,17**
Partners				
ARWU	**0,8**	**0,9**	**457,8**	1,0
Centrality	**1,12**	**1,30**	**0,10**	**0,75**
EU funding (sum)	**1,11**	**1,32**	**15533230,7**	**0,68**
EU funding per application	**1,28**	**1,21**	**61965,2**	**0,86**
EU funding per project	**1,02**	**1,08**	**276112,9**	**0,82**
Mean number of applications	**1,10**	**1,30**	**159,08**	**0,76**
Mean number of projects	**1,15**	**1,36**	**30,93**	**0,74**
MNCS	**1,12**	**1,05**	**0,88**	**0,96**
Publications	**1,35**	**1,12**	**2563,93**	1,00
Success rate	**1,50**	**1,25**	**0,22**	**1,01**

A.46 Information and Communication Technologies						
REC, Collaborative project	NL	FI	**NO**	AT	DK	SE
Success rate	18,55	16,05	**15,55**	14,78	13,08	11,82
Partners per application	**1,02**	**1,02**	**10,4**	**0,94**	**1,10**	**1,03**
Applications (N)	814	673	**508**	812	130	110
Coordinators						
ARWU	**0,8**	**1,0**	**478,7**	**1,0**	**0,9**	**0,9**
Centrality	**0,98**	**1,33**	**0,14**	**0,85**	**0,74**	**0,63**
EU funding per application	**1,06**	**0,95**	**85972,9**	**0,84**	**0,73**	**0,86**
EU funding per project	**0,91**	**0,87**	**451395,3**	**0,83**	**0,75**	**0,91**
Mean number of applications	**0,98**	**1,43**	**250,35**	**0,93**	**0,72**	**0,57**
Mean number of projects	**1,01**	**1,43**	**46,86**	**0,88**	**0,71**	**0,55**
MNCS	**1,12**	**1,03**	**0,86**	**0,98**	**1,09**	**1,03**
Publications	**1,36**	1,00	**2190,28**	**1,06**	**1,05**	**1,08**
Success rate	**1,11**	**1,04**	**0,17**	**0,97**	**0,87**	**0,96**
Partners						
ARWU	**0,9**	**1,0**	**473,4**	**1,0**	**1,0**	**0,9**
Centrality	**0,99**	**1,25**	**0,09**	**0,90**	**0,75**	**1,09**
EU funding (sum)	**0,94**	**1,24**	**14781914,6**	**0,85**	**0,71**	**1,08**
EU funding per application	**1,06**	**0,99**	**64763,0**	**0,89**	**0,85**	**0,91**
EU funding per project	**0,95**	**0,94**	**301977,7**	**0,91**	**0,91**	**0,93**
Mean number of applications	**0,94**	**1,24**	**159,50**	**0,92**	**0,74**	**1,09**
Mean number of projects	**0,98**	**1,29**	**29,18**	**0,90**	**0,74**	**1,12**
MNCS	**1,07**	1,00	**0,85**	1,00	**0,98**	**1,04**
Publications	**1,24**	**1,02**	**2426,52**	**1,06**	**0,96**	**1,15**
Success rate	**1,13**	**1,03**	**0,18**	**0,95**	**0,90**	**0,92**

A.47 Nanosciences, Nanotechnologies, Materials and new Production Technologies						
HES, Collaborative project	DK	AT	NL	FI	SE	NO
Success rate	29,51	29,27	27,32	24,68	23,18	20,45
Partners per application	0,93	0,98	0,84	0,81	0,79	12,99
Applications (N)	244	205	366	231	453	88
Coordinators						
ARWU	1,1	1,3	0,9	1,4	1,1	338,8
Centrality	1,10	0,97	0,95	0,97	0,85	0,14
EU funding per application	1,05	0,97	1,01	0,84	0,98	124089,0
EU funding per project	0,95	0,88	0,95	0,86	0,95	435906,3
Mean number of applications	0,99	0,99	0,93	1,02	0,85	90,26
Mean number of projects	1,12	1,06	1,02	1,06	0,87	22,25
MNCS	1,05	0,92	1,10	0,89	0,97	0,96
Publications	1,03	0,83	1,17	0,76	1,02	2999,87
Success rate	1,21	1,14	1,18	1,07	1,13	0,22
Partners						
ARWU	0,9	1,1	0,9	1,2	1,0	391,1
Centrality	1,20	1,05	1,03	0,96	1,05	0,07
EU funding (sum)	1,14	1,05	1,03	0,93	1,04	5303994,3
EU funding per application	1,16	1,14	1,22	1,11	1,15	84413,2
EU funding per project	1,06	1,04	1,11	1,01	1,07	254309,1
Mean number of applications	1,08	1,02	1,00	0,92	1,02	42,49
Mean number of projects	1,18	1,07	1,06	0,97	1,05	11,10
MNCS	1,04	0,96	1,06	0,91	1,00	0,94
Publications	1,10	0,89	1,11	0,87	1,05	3053,04
Success rate	1,22	1,17	1,18	1,18	1,17	0,26

A.48 Nanosciences, Nanotechnologies, Materials and new Production Technologies						
PRC, Collaborative project	DK	FI	NL	NO	AT	SE
Success rate	31,33	30,71	29,96	29,41	27,27	26,46
Partners per application	0,85	0,90	0,84	14,97	0,86	0,68
Applications (N)	233	241	504	119	264	393
Coordinators						
ARWU	1,0	1,2	1,0	380,5	1,2	0,9
Centrality	0,93	0,92	0,88	0,20	1,07	0,37
EU funding per application	0,86	0,76	0,80	151400,4	0,71	0,68
EU funding per project	0,91	0,82	0,83	473314,1	0,82	0,73
Mean number of applications	0,95	0,91	0,85	134,02	1,17	0,31
Mean number of projects	0,99	0,91	0,91	34,39	1,20	0,32
MNCS	1,03	0,93	1,02	0,94	0,96	0,99
Publications	1,05	0,78	1,07	2964,79	0,86	1,10
Success rate	0,98	0,95	1,02	0,26	0,88	0,96
Partners						
ARWU	0,9	1,1	1,0	424,6	1,1	1,0
Centrality	0,92	0,99	0,95	0,07	0,88	0,51
EU funding (sum)	0,96	1,02	0,99	5341982,7	0,96	0,38
EU funding per application	1,08	1,03	1,07	88564,3	0,99	0,95
EU funding per project	1,02	0,99	1,03	238227,2	0,96	0,90
Mean number of applications	0,95	1,02	0,98	40,32	0,96	0,46
Mean number of projects	0,97	1,02	1,00	11,11	0,95	0,46
MNCS	1,02	0,95	1,01	0,92	0,97	0,98
Publications	1,11	0,95	1,06	2792,19	0,95	1,02
Success rate	1,03	1,03	1,04	0,30	0,95	0,96

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A.49 Nanosciences, Nanotechnologies, Materials and new Production Technologies						
REC, Collaborative project	DK	NL	SE	**NO**	FI	AT
Success rate	38,96	31,93	31,08	25,52	23,26	22,77
Partners per application	0,89	0,91	1,01	14,03	0,88	1,08
Applications (N)	77	285	74	145	288	101
Coordinators						
ARWU	0,9	0,9	1,2	405,7	1,0	1,0
Centrality	0,57	1,01	0,77	0,18	1,25	0,61
EU funding per application	1,16	1,05	1,05	137559,6	0,92	0,79
EU funding per project	1,05	0,93	1,04	433095,7	0,97	0,81
Mean number of applications	0,48	0,80	0,62	115,40	1,27	0,60
Mean number of projects	0,55	0,96	0,68	30,74	1,20	0,58
MNCS	1,01	1,06	0,86	0,93	0,99	0,98
Publications	1,12	1,26	1,05	2603,16	0,97	1,16
Success rate	1,22	1,16	1,12	0,26	0,97	0,90
Partners						
ARWU	0,9	1,0	1,0	404,4	1,1	1,1
Centrality	1,07	1,04	0,85	0,08	1,14	0,83
EU funding (sum)	1,05	0,99	0,90	5618441,2	1,19	0,89
EU funding per application	1,16	1,18	0,92	91749,5	0,95	0,89
EU funding per project	1,02	1,02	0,84	261311,1	0,93	0,86
Mean number of applications	1,02	0,92	0,88	42,99	1,18	0,89
Mean number of projects	1,09	1,05	0,91	11,59	1,18	0,89
MNCS	1,02	1,01	0,98	0,92	0,96	0,97
Publications	1,14	1,05	1,01	2934,57	0,92	1,00
Success rate	1,29	1,19	1,02	0,30	1,00	0,89

A.50 Research Infrastructures						
HES, Combination of CP & CSA	**NO**	DK	SE	FI	NL	AT
Success rate	55,56	54,08	53,42	50,57	48,19	42,86
Partners per application	23,52	0,90	0,84	0,96	0,76	0,92
Applications (N)	54	98	161	87	166	91
Coordinators						
ARWU	257,7	1,3	1,2	1,3	0,9	1,5
Centrality	0,22	1,09	1,12	1,03	1,13	0,96
EU funding per application	230973,0	1,22	1,06	1,08	1,15	1,33
EU funding per project	418931,8	1,24	1,02	1,04	1,14	1,41
Mean number of applications	32,52	1,14	1,24	1,07	1,26	1,11
Mean number of projects	16,98	1,14	1,21	1,06	1,20	1,05
MNCS	1,05	0,92	0,96	0,92	1,04	0,87
Publications	4452,00	0,86	0,87	0,93	1,17	0,68
Success rate	0,51	0,97	0,94	0,95	0,97	0,85
Partners						
ARWU	344,5	1,0	1,0	1,0	1,0	1,1
Centrality	0,16	1,02	1,02	1,06	1,05	0,88
EU funding (sum)	3966896,4	1,10	1,25	1,22	1,27	0,92
EU funding per application	129342,9	1,10	1,17	1,09	1,14	0,99
EU funding per project	233402,0	1,09	1,17	1,11	1,13	0,97
Mean number of applications	20,54	1,04	1,10	1,12	1,16	0,90
Mean number of projects	10,72	1,05	1,10	1,11	1,15	0,89
MNCS	0,96	0,99	0,98	0,99	1,00	0,95
Publications	3395,88	1,02	1,03	1,06	1,06	0,93
Success rate	0,54	1,01	0,99	0,97	0,99	0,94

A.51 Research Infrastructures				
PRC, Combination of CP & CSA	FI	**NO**	NL	AT
Success rate	76,92	**55,00**	44,44	43,48
Partners per application	**1,05**	**21,65**	**0,97**	**0,83**
Applications (N)	26	**20**	54	23
Coordinators				
ARWU	**0,8**	**277,0**	**1,3**	**0,9**
Centrality	**1,50**	**0,20**	1,00	**0,75**
EU funding per application	**1,31**	**248527,2**	**1,80**	**1,32**
EU funding per project	**1,38**	**450934,7**	**1,89**	**1,15**
Mean number of applications	**1,67**	**28,58**	**0,96**	**0,75**
Mean number of projects	**1,61**	**15,37**	**0,94**	**0,68**
MNCS	**1,17**	**1,02**	**0,92**	**1,08**
Publications	**1,69**	**3168,63**	**1,12**	**1,20**
Success rate	**1,02**	**0,51**	**0,91**	**1,02**
Partners				
ARWU	**0,9**	**434,7**	**1,0**	**0,9**
Centrality	**1,20**	**0,15**	**0,85**	**0,96**
EU funding (sum)	**1,29**	**4763300,7**	**0,64**	**0,93**
EU funding per application	**1,18**	**173229,4**	**0,75**	**0,87**
EU funding per project	**1,21**	**290047,3**	**0,77**	**0,91**
Mean number of applications	**1,20**	**20,30**	**0,75**	1,00
Mean number of projects	**1,21**	**11,06**	**0,72**	**0,95**
MNCS	**1,06**	**0,87**	**0,98**	**1,10**
Publications	**1,13**	**3057,82**	**0,91**	**1,10**
Success rate	**1,19**	**0,53**	**1,05**	**0,92**

A.52 Research Infrastructures				
REC, Combination of CP & CSA	**NO**	NL	FI	AT
Success rate	**53,13**	46,45	43,48	42,37
Partners per application	**21,05**	**0,92**	**1,15**	**0,96**
Applications (N)	**64**	183	46	59
Coordinators				
ARWU	**262,4**	**0,9**	**0,9**	**1,7**
Centrality	**0,24**	**1,01**	**1,05**	**0,74**
EU funding per application	**232442,8**	**1,26**	**0,96**	**0,94**
EU funding per project	**385815,0**	**1,36**	**1,01**	**0,99**
Mean number of applications	**32,37**	**1,20**	**1,19**	**0,85**
Mean number of projects	**17,37**	**1,14**	**1,19**	**0,80**
MNCS	**1,08**	**1,02**	**0,99**	**0,77**
Publications	**3822,77**	**1,22**	**1,06**	**0,70**
Success rate	**0,54**	**0,89**	**0,98**	**0,82**
Partners				
ARWU	**384,9**	**1,0**	**1,0**	**0,9**
Centrality	**0,15**	1,00	**0,97**	**0,97**
EU funding (sum)	**3514618,6**	**1,20**	**0,95**	**1,15**
EU funding per application	**133010,1**	**1,12**	**0,88**	**0,91**
EU funding per project	**230775,4**	**1,15**	**0,91**	**0,94**
Mean number of applications	**18,77**	**1,07**	**0,98**	**1,07**
Mean number of projects	**9,90**	**1,05**	**0,96**	**1,04**
MNCS	**0,92**	**1,02**	**0,99**	**1,02**
Publications	**3093,59**	**1,12**	**1,01**	**1,11**
Success rate	**0,56**	**0,94**	**0,90**	**0,88**

A.53 Research infrastructures (H2020) HES, Research and Innovation action	FI	NO	DK	NL	SE	AT
Success rate	46,67	**37,93**	35,71	31,71	31,34	29,17
Partners per application	0,95	**24,83**	0,78	0,71	0,79	0,76
Applications (N)	30	**29**	42	82	67	24
Coordinators						
ARWU	1,1	**266,6**	1,0	1,1	1,1	1,1
Centrality	1,08	**0,19**	0,91	1,03	1,16	0,94
EU funding per application	1,02	**187581,3**	1,19	1,19	1,13	0,74
EU funding per project	1,18	**397266,5**	1,32	1,18	1,18	0,95
Mean number of applications	1,16	**11,31**	1,00	1,21	1,39	1,23
Mean number of projects	1,05	**5,00**	0,93	1,10	1,32	1,01
MNCS	0,97	**1,03**	1,02	1,01	1,03	0,95
Publications	0,96	**4510,88**	1,02	0,97	0,91	0,95
Success rate	0,88	**0,36**	0,94	0,90	0,92	0,84
Partners						
ARWU	1,0	**372,0**	1,0	0,9	0,9	1,0
Centrality	1,05	**0,15**	1,02	0,98	1,06	0,91
EU funding (sum)	1,16	**1667035,4**	1,10	1,15	1,27	0,99
EU funding per application	1,10	**116232,1**	1,11	1,10	1,12	1,10
EU funding per project	1,09	**238798,1**	1,14	1,14	1,18	1,13
Mean number of applications	1,08	**8,75**	1,07	1,09	1,19	0,95
Mean number of projects	1,10	**3,67**	1,06	1,07	1,17	0,94
MNCS	1,01	**0,91**	1,03	1,06	1,04	1,02
Publications	1,01	**3204,83**	1,03	1,14	1,12	0,98
Success rate	1,02	**0,40**	0,98	0,90	0,91	0,93

A.54 Research infrastructures (H2020) REC, Research and Innovation action	NO	FI	NL	AT
Success rate	**50,00**	36,36	30,12	23,68
Partners per application	**19,10**	1,22	0,97	1,05
Applications (N)	**20**	22	83	38
Coordinators				
ARWU	**294,6**	0,6	0,9	1,2
Centrality	**0,27**	0,94	0,54	0,53
EU funding per application	**164759,8**	1,11	1,25	1,00
EU funding per project	**416746,4**	0,92	1,08	0,99
Mean number of applications	**17,75**	0,83	0,61	0,56
Mean number of projects	**8,00**	0,86	0,48	0,47
MNCS	**0,95**	1,01	1,11	0,97
Publications	**3756,25**	1,17	1,08	0,83
Success rate	**0,34**	1,10	0,86	0,76
Partners				
ARWU	**381,5**	1,0	1,0	0,9
Centrality	**0,13**	1,13	1,03	0,93
EU funding (sum)	**1617717,7**	1,11	1,12	0,98
EU funding per application	**153541,2**	0,83	0,82	0,73
EU funding per project	**292565,1**	0,90	0,89	0,85
Mean number of applications	**7,90**	1,12	1,12	1,04
Mean number of projects	**3,46**	1,12	1,04	0,94
MNCS	**0,92**	1,02	1,01	1,02
Publications	**3109,89**	1,02	1,06	1,12
Success rate	**0,47**	0,90	0,78	0,69

A.55 Science in Society						
HES, Coordination & support action	NL	SE	**NO**	DK	AT	FI
Success rate	28,46	25,00	**24,62**	24,32	19,51	10,99
Partners per application	**1,01**	**0,92**	**15,52**	**1,10**	**0,98**	**1,02**
Applications (N)	123	92	**65**	74	82	91
Coordinators						
ARWU	**1,0**	**1,1**	**426,0**	**0,9**	**1,2**	**1,0**
Centrality	**0,97**	**0,88**	**0,17**	**1,17**	**0,90**	**0,96**
EU funding per application	**0,96**	**0,94**	**70609,4**	**1,10**	**0,60**	**0,42**
EU funding per project	**0,91**	**0,90**	**232097,9**	**1,08**	**0,77**	**0,64**
Mean number of applications	**1,06**	**1,01**	**9,35**	**1,28**	**1,13**	**1,42**
Mean number of projects	**1,08**	**0,88**	**2,29**	**1,20**	**0,87**	**0,92**
MNCS	**0,98**	**0,97**	**0,86**	**1,05**	**0,85**	**0,98**
Publications	**1,06**	**0,93**	**2696,20**	**1,23**	**0,74**	**0,94**
Success rate	**1,03**	**0,98**	**0,24**	**0,98**	**0,74**	**0,54**
Partners						
ARWU	**1,0**	**1,0**	**486,6**	**1,0**	**1,1**	**1,1**
Centrality	**0,88**	**0,85**	**0,18**	**0,93**	**0,80**	**0,87**
EU funding (sum)	**0,99**	**0,95**	**395214,5**	**0,94**	**0,85**	**0,89**
EU funding per application	**0,98**	1,00	**37230,9**	**0,88**	**0,82**	**0,72**
EU funding per project	**0,93**	1,00	**112687,9**	**0,86**	**0,92**	**0,86**
Mean number of applications	**0,96**	**0,94**	**9,51**	**0,95**	**0,93**	**1,05**
Mean number of projects	**0,93**	**0,89**	**2,32**	**0,93**	**0,82**	**0,88**
MNCS	**1,02**	**0,99**	**0,78**	**1,01**	**0,96**	**0,98**
Publications	**1,01**	**0,92**	**2375,06**	1,00	**0,87**	**0,92**
Success rate	**0,83**	**0,85**	**0,29**	**0,83**	**0,73**	**0,62**

A.56 Science in Society			
HES, Collaborative project	NL	**NO**	SE
Success rate	34,04	**33,33**	14,29
Partners per application	**0,91**	**8,48**	**1,08**
Applications (N)	47	**21**	21
Coordinators			
ARWU	**0,9**	**406,5**	**1,2**
Centrality	**0,87**	**0,23**	**0,60**
EU funding per application	**1,42**	**60492,4**	**1,30**
EU funding per project	**1,11**	**174723,6**	1,00
Mean number of applications	**0,85**	**13,62**	**0,64**
Mean number of projects	**0,86**	**4,24**	**0,54**
MNCS	**1,09**	**0,88**	**0,88**
Publications	**1,05**	**3216,86**	**0,75**
Success rate	**1,09**	**0,31**	**1,04**
Partners			
ARWU	**1,0**	**397,5**	**1,3**
Centrality	**0,84**	**0,22**	**0,71**
EU funding (sum)	**0,77**	**684742,3**	**0,59**
EU funding per application	**0,93**	**53690,8**	**0,62**
EU funding per project	**0,84**	**167893,1**	**0,63**
Mean number of applications	**0,81**	**12,92**	**0,75**
Mean number of projects	**0,86**	**3,53**	**0,66**
MNCS	**1,02**	**0,90**	**0,85**
Publications	**0,99**	**3068,16**	**0,74**
Success rate	**1,18**	**0,28**	**0,73**

A.57 Secure societies - Protecting freedom and security of Europe and its citizens					
PRC, Total	FI	**NO**	SE	NL	AT
Success rate	16,67	**14,29**	12,50	9,59	8,00
Partners per application	**1,25**	**10,57**	**0,90**	**1,20**	**1,24**
Applications (N)	24	**21**	24	73	50
Coordinators					
ARWU	**1,5**	**364,7**	**1,3**	**1,5**	**1,4**
Centrality	**0,78**	**0,05**	**1,49**	**3,20**	**1,76**
EU funding per application	**0,78**	**86126,5**	**1,02**	**0,68**	**0,52**
EU funding per project	**0,95**	**299863,6**	**0,74**	1,00	**0,56**
Mean number of applications	**0,87**	**5,52**	**0,93**	**2,41**	**1,49**
Mean number of projects	**0,75**	**0,67**	**1,41**	**2,79**	**1,53**
MNCS	**0,82**	**0,98**	**0,96**	**0,80**	**0,81**
Publications	**0,37**	**3829,49**	**0,59**	**0,52**	**0,48**
Success rate	**0,79**	**0,11**	**2,02**	**0,93**	**0,67**
Partners					
ARWU	**1,0**	**554,5**	**0,9**	**0,9**	**0,9**
Centrality	1,00	**0,07**	**0,29**	**0,70**	**0,52**
EU funding (sum)	**0,92**	**476207,2**	**0,27**	**0,63**	**0,45**
EU funding per application	**0,88**	**68469,8**	**0,61**	**0,58**	**0,43**
EU funding per project	**1,04**	**171724,8**	**0,51**	**0,72**	**0,53**
Mean number of applications	**1,03**	**5,56**	**0,46**	**0,95**	**0,76**
Mean number of projects	**0,98**	**0,96**	**0,30**	**0,68**	**0,51**
MNCS	**1,04**	**0,71**	**1,15**	**1,11**	**1,12**
Publications	**1,01**	**1891,53**	**1,26**	**1,15**	**1,21**
Success rate	**0,95**	**0,17**	**0,54**	**0,62**	**0,51**

A.58 Secure societies - Protecting freedom and security of Europe and its citizens				
REC, Total	**NO**	AT	NL	FI
Success rate	**14,29**	12,96	7,69	4,55
Partners per application	**14,00**	**0,89**	1,00	**1,03**
Applications (N)	**35**	54	39	22
Coordinators				
ARWU	**602,7**	**0,7**	**0,8**	**1,0**
Centrality	**0,13**	**0,85**	**1,09**	**0,55**
EU funding per application	**110492,8**	**0,50**	**0,54**	**0,20**
EU funding per project	**456563,8**	**0,51**	**0,79**	**0,42**
Mean number of applications	**12,17**	**0,87**	**1,11**	**0,81**
Mean number of projects	**1,89**	**0,77**	**0,94**	**0,48**
MNCS	**0,73**	**1,16**	**1,12**	**1,04**
Publications	**1904,43**	**1,68**	**1,21**	**0,60**
Success rate	**0,12**	**0,84**	**0,93**	**0,37**
Partners				
ARWU	**525,7**	**0,9**	**0,8**	**1,0**
Centrality	**0,06**	**1,33**	**1,07**	**0,94**
EU funding (sum)	**359172,0**	**1,20**	**1,04**	**1,03**
EU funding per application	**51777,5**	**0,83**	**0,67**	**0,63**
EU funding per project	**161062,1**	**0,88**	**0,89**	**0,98**
Mean number of applications	**5,67**	**1,14**	**1,13**	**1,01**
Mean number of projects	**0,74**	**1,29**	**1,03**	**0,97**
MNCS	**0,75**	**1,06**	**1,19**	**1,03**
Publications	**2042,12**	**1,16**	**1,41**	1,00
Success rate	**0,13**	**1,12**	**0,75**	**0,66**

A.59 Secure, clean and efficient energy HES, Research and Innovation action	AT	SE	NL	DK	FI	NO
Success rate	23,81	13,56	9,41	9,09	8,82	3,57
Partners per application	0,92	0,81	0,73	0,78	0,71	11,57
Applications (N)	42	59	85	66	34	28
Coordinators						
ARWU	1,4	0,9	0,8	1,0	1,7	360,8
Centrality	1,31	1,22	1,45	1,65	0,83	0,12
EU funding per application	1,12	0,68	1,25	0,90	0,38	105909,3
EU funding per project	1,25	0,97	1,48	1,12	0,53	368014,6
Mean number of applications	1,22	1,36	1,24	1,53	0,82	16,11
Mean number of projects	1,41	1,37	1,45	1,59	0,84	2,32
MNCS	0,77	0,95	1,09	1,02	0,66	1,04
Publications	0,75	1,12	1,33	0,92	0,46	3057,92
Success rate	1,18	1,02	1,26	1,06	0,60	0,14
Partners						
ARWU	1,1	0,9	0,9	1,0	1,2	420,4
Centrality	0,92	1,01	1,18	1,39	0,74	0,10
EU funding (sum)	0,77	0,88	1,08	1,24	0,61	1145637,7
EU funding per application	1,18	1,01	1,16	1,30	0,62	68078,3
EU funding per project	0,94	1,01	1,20	1,33	0,68	250211,4
Mean number of applications	0,81	0,86	0,99	1,13	0,71	13,39
Mean number of projects	0,97	1,00	1,15	1,30	0,76	1,85
MNCS	0,97	1,02	1,06	1,06	0,94	0,91
Publications	0,74	1,03	1,05	1,02	0,85	3020,49
Success rate	1,63	1,32	1,24	1,34	0,97	0,12

A.60 Secure, clean and efficient energy PRC, Research and Innovation action	NO	SE	AT	NL	DK	FI
Success rate	18,52	15,69	14,89	14,63	11,36	9,68
Partners per application	10,67	0,65	1,04	0,82	0,83	0,90
Applications (N)	27	51	47	123	44	31
Coordinators						
ARWU	405,6	1,1	1,1	1,0	1,1	1,5
Centrality	0,17	0,50	0,90	0,96	0,92	0,88
EU funding per application	173275,0	0,50	0,83	0,70	0,47	1,16
EU funding per project	558622,9	0,59	0,75	0,80	0,76	1,06
Mean number of applications	22,26	0,48	0,87	0,87	0,83	1,03
Mean number of projects	3,30	0,44	0,92	0,95	0,84	0,94
MNCS	0,91	0,96	0,86	1,10	1,08	0,77
Publications	3075,83	0,73	0,95	1,02	0,69	0,45
Success rate	0,21	0,62	0,94	0,65	0,54	0,52
Partners						
ARWU	460,7	1,0	1,0	0,8	0,9	1,0
Centrality	0,11	0,61	0,91	0,88	1,00	0,84
EU funding (sum)	1259163,7	0,50	0,82	0,82	0,89	0,74
EU funding per application	110771,7	0,64	0,66	0,79	0,79	0,66
EU funding per project	329885,1	0,65	0,68	0,83	0,91	0,69
Mean number of applications	12,27	0,53	0,94	0,90	1,01	0,83
Mean number of projects	1,98	0,55	0,93	0,91	0,95	0,81
MNCS	0,86	0,99	1,05	1,14	1,10	1,04
Publications	2688,85	1,01	0,93	1,21	1,09	0,99
Success rate	0,15	1,07	1,00	1,07	0,97	0,85

A.61 Secure, clean and efficient energy						
PRC, Innovation action	DK	SE	**NO**	FI	NL	AT
Success rate	21,74	19,44	**19,35**	18,52	12,68	8,70
Partners per application	**1,17**	**0,97**	**13,65**	**1,35**	**1,13**	**1,20**
Applications (N)	46	36	**31**	27	71	46
Coordinators						
ARWU	**1,3**	**1,2**	**528,4**	**1,2**	**1,2**	**1,0**
Centrality	**2,02**	**0,84**	**0,09**	**1,38**	**1,55**	**1,50**
EU funding per application	**1,04**	**3,73**	**262071,3**	**0,38**	**1,26**	**0,79**
EU funding per project	**1,27**	**2,24**	**588028,6**	**0,76**	**0,95**	**0,93**
Mean number of applications	**1,54**	**0,46**	**14,20**	**1,11**	**1,19**	**1,18**
Mean number of projects	**2,00**	**0,60**	**1,83**	**1,25**	**1,57**	**1,38**
MNCS	**0,99**	**1,11**	**0,72**	**1,07**	**1,06**	**1,23**
Publications	**0,64**	**0,92**	**1685,45**	**1,03**	**0,76**	**1,41**
Success rate	**0,78**	**1,15**	**0,16**	**0,95**	**0,91**	**0,87**
Partners						
ARWU	**1,0**	1,0	**478,0**	**1,1**	**1,0**	**1,1**
Centrality	**1,02**	**0,79**	**0,09**	**0,63**	**0,85**	**0,78**
EU funding (sum)	**0,93**	**0,67**	**916032,6**	**0,64**	**0,82**	**0,78**
EU funding per application	**0,78**	**0,79**	**161505,2**	**0,55**	**0,52**	**0,53**
EU funding per project	**0,81**	**0,85**	**336706,6**	**0,64**	**0,69**	**0,71**
Mean number of applications	1,00	**0,63**	**8,47**	**0,85**	**0,90**	**0,85**
Mean number of projects	**0,98**	**0,65**	**1,47**	**0,71**	**0,84**	**0,77**
MNCS	**0,99**	**0,99**	**0,86**	**0,96**	**0,98**	**0,90**
Publications	**0,94**	**1,03**	**2469,83**	**0,97**	**1,08**	**0,85**
Success rate	**1,10**	**0,99**	**0,20**	**0,62**	**0,75**	**0,65**

A.62 Secure, clean and efficient energy				
REC, Research and Innovation action	**NO**	NL	FI	AT
Success rate	**15,69**	14,52	11,76	6,67
Partners per application	**11,16**	**0,87**	**0,98**	**0,96**
Applications (N)	**51**	62	34	30
Coordinators				
ARWU	**388,0**	**1,0**	**1,3**	**1,1**
Centrality	**0,12**	**1,65**	**1,63**	**1,36**
EU funding per application	**164889,5**	**0,92**	**0,45**	**0,41**
EU funding per project	**512472,1**	**1,14**	**0,68**	**0,76**
Mean number of applications	**15,92**	**1,42**	**1,78**	**1,24**
Mean number of projects	**2,47**	**1,66**	**1,74**	**1,15**
MNCS	**0,97**	**1,04**	**0,83**	**1,04**
Publications	**3256,08**	**0,79**	**0,82**	**0,99**
Success rate	**0,19**	**0,95**	**0,70**	**0,67**
Partners				
ARWU	**438,5**	**0,8**	**1,1**	**1,0**
Centrality	**0,13**	**0,98**	**0,98**	**0,90**
EU funding (sum)	**1415346,4**	**1,04**	1,00	**0,80**
EU funding per application	**111350,7**	**1,03**	**0,75**	**0,59**
EU funding per project	**352662,5**	1,00	**0,86**	**0,71**
Mean number of applications	**13,80**	**0,99**	**1,05**	**0,88**
Mean number of projects	**2,28**	**1,04**	**1,02**	**0,84**
MNCS	**0,90**	**1,15**	**0,95**	**1,01**
Publications	**2828,30**	**1,26**	**0,89**	**0,91**
Success rate	**0,19**	1,00	**0,81**	**0,75**

A.63 Security						
HES, Collaborative project	AT	NL	SE	**NO**	FI	DK
Success rate	26,04	22,45	17,75	**17,54**	17,53	13,04
Partners per application	**1,14**	**1,11**	**1,03**	**11,02**	**1,13**	**1,13**
Applications (N)	96	147	169	**57**	97	69
Coordinators						
ARWU	**1,0**	**0,7**	**0,7**	537,1	**0,9**	**0,7**
Centrality	0,59	1,30	0,86	0,15	0,88	0,54
EU funding per application	**1,17**	**1,27**	**1,35**	87243,5	**1,25**	**1,10**
EU funding per project	**1,31**	**1,20**	**1,23**	302722,8	**1,25**	**1,39**
Mean number of applications	0,55	1,21	0,77	41,16	0,79	0,59
Mean number of projects	0,52	1,28	0,81	11,26	0,75	0,48
MNCS	**1,01**	**1,26**	**1,19**	0,77	**1,08**	**1,33**
Publications	**1,17**	**2,11**	**1,76**	1681,30	**1,17**	**1,91**
Success rate	0,95	1,06	1,11	0,22	1,01	0,83
Partners						
ARWU	**1,0**	**0,9**	**0,9**	517,1	**1,0**	**0,9**
Centrality	0,83	0,99	0,96	0,08	0,93	0,95
EU funding (sum)	0,75	0,93	0,94	2583597,3	0,85	1,02
EU funding per application	**1,02**	**1,01**	0,89	76952,5	0,92	0,75
EU funding per project	0,98	0,97	0,97	235380,2	0,92	0,95
Mean number of applications	0,78	0,95	0,98	21,89	0,90	1,04
Mean number of projects	0,77	0,93	0,95	5,56	0,90	0,97
MNCS	**1,01**	**1,14**	**1,09**	0,76	0,98	**1,10**
Publications	0,85	**1,24**	**1,19**	2223,54	0,89	**1,11**
Success rate	1,09	1,13	0,96	0,22	0,98	0,74

A.64 Security						
PRC, Collaborative project	**NO**	FI	AT	SE	DK	NL
Success rate	**26,32**	24,18	22,94	22,86	22,39	20,40
Partners per application	**13,20**	**1,07**	**1,04**	0,71	**1,10**	**1,01**
Applications (N)	**76**	91	109	140	67	250
Coordinators						
ARWU	556,8	**0,9**	**0,8**	**1,0**	**0,9**	**0,8**
Centrality	0,13	1,48	1,23	0,53	1,07	1,32
EU funding per application	188335,6	0,74	0,58	0,55	0,63	0,60
EU funding per project	490079,8	0,86	0,82	0,76	1,00	0,77
Mean number of applications	32,54	**1,45**	**1,41**	0,49	**1,12**	**1,39**
Mean number of projects	9,53	**1,39**	**1,30**	0,43	**1,01**	**1,35**
MNCS	0,75	**1,24**	**1,15**	**1,03**	**1,13**	**1,14**
Publications	1477,01	**1,59**	**1,87**	**1,28**	**1,33**	**1,70**
Success rate	0,28	0,96	0,77	0,69	0,68	0,77
Partners						
ARWU	525,6	**0,9**	1,0	**1,0**	**0,9**	**1,0**
Centrality	0,08	**1,12**	1,00	0,55	**1,30**	**1,18**
EU funding (sum)	2359040,2	**1,06**	0,95	0,42	**1,27**	**1,17**
EU funding per application	82765,8	0,99	**1,05**	0,98	**1,09**	0,97
EU funding per project	240376,8	1,00	0,99	0,96	**1,06**	**1,01**
Mean number of applications	19,95	**1,09**	0,93	0,50	**1,16**	**1,13**
Mean number of projects	4,96	**1,11**	0,95	0,46	**1,26**	**1,18**
MNCS	0,76	**1,08**	**1,03**	**1,03**	**1,10**	**1,06**
Publications	2047,39	**1,14**	**1,02**	**1,05**	**1,25**	**1,11**
Success rate	0,24	**1,02**	**1,07**	0,94	**1,07**	**1,01**

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A.65 Security					
REC, Coordination & support action	NL	**NO**	AT		
Success rate	46,15	**38,10**	33,33		
Partners per application	1,00	**10,76**	0,86		
Applications (N)	26	**21**	21		
Coordinators					
ARWU	**0,8**	376,0	**1,2**		
Centrality	**1,71**	0,19	**1,20**		
EU funding per application	1,00	119190,7	0,76		
EU funding per project	**1,11**	359952,7	0,84		
Mean number of applications	**2,14**	38,52	**1,64**		
Mean number of projects	**2,01**	12,05	**1,53**		
MNCS	0,98	1,05	0,84		
Publications	**1,79**	2160,76	**1,46**		
Success rate	0,98	0,32	0,77		
Partners					
ARWU	**1,0**	527,3	**1,1**		
Centrality	**1,24**	0,16	0,83		
EU funding (sum)	**1,31**	5364338,6	0,81		
EU funding per application	**1,21**	83513,2	0,92		
EU funding per project	**1,14**	244548,5	0,96		
Mean number of applications	**1,14**	40,17	0,83		
Mean number of projects	**1,27**	11,34	0,83		
MNCS	**1,11**	0,71	**1,01**		
Publications	0,99	2121,82	0,73		
Success rate	**1,12**	0,29	0,98		

A.66 Security					
REC, Collaborative project	**NO**	NL	AT	FI	DK
Success rate	**28,13**	27,32	23,13	22,13	20,83
Partners per application	**12,85**	**1,09**	0,94	**1,21**	0,89
Applications (N)	**96**	194	134	122	24
Coordinators					
ARWU	**490,5**	**0,9**	**1,1**	**0,9**	**0,5**
Centrality	**0,15**	**2,01**	0,98	**1,40**	0,35
EU funding per application	**127202,8**	**1,14**	0,87	0,98	0,64
EU funding per project	**406294,5**	**1,05**	0,85	**1,10**	0,84
Mean number of applications	**37,69**	**1,95**	**1,06**	**1,53**	0,50
Mean number of projects	**10,96**	**2,17**	**1,04**	**1,33**	0,34
MNCS	**0,82**	**1,09**	0,90	**1,07**	**1,37**
Publications	**2245,29**	**1,14**	0,81	**1,08**	**1,65**
Success rate	**0,24**	**1,16**	**1,02**	**1,02**	0,80
Partners					
ARWU	**507,6**	**0,9**	**1,0**	**1,0**	**1,1**
Centrality	**0,10**	**1,26**	0,88	**1,15**	0,58
EU funding (sum)	**2946857,8**	**1,35**	0,97	**1,16**	0,61
EU funding per application	**92977,5**	**1,01**	0,79	0,87	0,60
EU funding per project	**278898,0**	0,94	0,82	0,89	0,73
Mean number of applications	**23,70**	**1,21**	0,96	**1,18**	0,70
Mean number of projects	**6,29**	**1,29**	0,94	**1,13**	0,63
MNCS	**0,79**	**1,08**	0,98	**1,04**	0,93
Publications	**2131,36**	**1,17**	0,98	**1,11**	0,89
Success rate	**0,26**	**1,04**	0,84	0,90	0,74

A.67 Smart, green and integrated transport					
PRC, Total	**NO**	AT	DK	SE	NL
Success rate	**40,00**	34,78	31,25	27,59	24,59
Partners per application	**19,68**	0,83	0,70	0,63	0,69
Applications (N)	**25**	69	32	58	122
Coordinators					
ARWU	**216,2**	2,0	2,0	1,4	1,8
Centrality	**0,12**	1,48	0,33	1,08	1,19
EU funding per application	**410137,8**	0,54	0,61	0,41	0,40
EU funding per project	**534064,2**	0,79	0,72	0,68	0,71
Mean number of applications	**9,12**	1,52	0,44	0,92	1,49
Mean number of projects	**2,56**	1,53	0,28	1,00	1,32
MNCS	**1,20**	0,72	0,75	0,83	0,77
Publications	**4000,70**	0,65	0,93	0,80	0,76
Success rate	**0,41**	0,78	0,60	0,61	0,59
Partners					
ARWU	**493,0**	0,9	0,9	0,9	0,9
Centrality	**0,09**	1,16	0,89	0,98	1,04
EU funding per application	**235007,0**	0,69	0,89	0,71	0,48
EU funding per project	**309494,8**	0,90	0,90	0,87	0,71
Mean number of applications	**4,45**	1,53	0,93	1,04	1,48
Mean number of projects	**1,44**	1,43	0,90	1,02	1,28
MNCS	**0,82**	1,06	1,05	1,05	1,06
Publications	**2421,86**	1,04	1,00	1,04	1,05
Success rate	**0,47**	0,73	0,90	0,74	0,65

A.68 Smart, green and integrated transport			
REC, Total	AT	NL	**NO**
Success rate	33,33	31,94	**26,09**
Partners per application	0,84	0,65	**17,17**
Applications (N)	45	72	**23**
Coordinators			
ARWU	0,7	0,6	**580,5**
Centrality	0,90	1,00	**0,20**
EU funding per application	1,39	1,49	**127443,0**
EU funding per project	1,01	1,42	**354183,5**
Mean number of applications	0,89	1,55	**13,52**
Mean number of projects	1,02	1,71	**3,61**
MNCS	1,16	1,26	**0,76**
Publications	2,01	1,91	**1523,08**
Success rate	1,31	1,07	**0,26**
Partners			
ARWU	1,0	1,1	**417,8**
Centrality	1,46	1,36	**0,09**
EU funding per application	2,49	1,79	**66395,6**
EU funding per project	1,89	1,46	**172932,2**
Mean number of applications	1,19	1,41	**6,82**
Mean number of projects	1,43	1,61	**1,76**
MNCS	0,93	0,91	**0,96**
Publications	0,97	0,93	**2923,46**
Success rate	1,41	1,36	**0,25**

A.69 Socio-economic sciences and Humanities						
HES, Collaborative project	DK	NL	SE	**NO**	AT	FI
Success rate	14,33	13,93	10,43	**10,27**	9,46	7,91
Partners per application	1,05	1,00	0,98	**10,68**	1,06	1,00
Applications (N)	321	639	441	**185**	296	392
Coordinators						
ARWU	1,1	1,0	1,1	**399,4**	1,2	1,2
Centrality	1,13	1,28	1,09	**0,22**	1,06	0,94
EU funding per application	1,09	1,22	0,95	**36263,4**	0,95	0,87
EU funding per project	0,88	0,93	0,79	**276438,4**	0,81	0,78
Mean number of applications	1,06	1,16	1,01	**37,66**	1,05	1,02
Mean number of projects	1,15	1,34	1,12	**4,84**	1,10	0,97
MNCS	0,97	1,05	0,95	**0,89**	0,90	0,93
Publications	1,01	1,18	0,96	**2931,14**	0,84	0,89
Success rate	1,08	1,17	1,02	**0,12**	0,96	0,91
Partners						
ARWU	1,0	1,0	1,0	**495,7**	1,1	1,1
Centrality	1,13	1,15	1,04	**0,18**	0,99	0,90
EU funding (sum)	1,18	1,29	1,10	**912098,8**	1,00	0,92
EU funding per application	1,15	1,18	0,99	**24606,5**	0,98	0,91
EU funding per project	1,04	1,04	0,97	**156004,8**	0,93	0,92
Mean number of applications	1,09	1,08	1,04	**29,84**	1,00	0,99
Mean number of projects	1,16	1,19	1,07	**3,87**	1,01	0,91
MNCS	1,00	1,06	1,00	**0,77**	0,96	0,97
Publications	1,02	1,14	1,02	**2299,75**	0,88	0,92
Success rate	1,13	1,12	0,98	**0,12**	0,98	0,90

A.70 Socio-economic sciences and Humanities					
REC, Collaborative project	AT	NL	DK	FI	**NO**
Success rate	16,52	14,46	13,64	12,12	**10,67**
Partners per application	1,06	1,10	1,02	1,09	**11,07**
Applications (N)	224	166	44	99	**150**
Coordinators					
ARWU	1,2	1,2	1,1	1,0	**391,2**
Centrality	1,10	1,08	1,01	1,23	**0,19**
EU funding per application	1,22	1,29	1,02	1,16	**36711,5**
EU funding per project	1,02	0,97	1,08	1,01	**230022,8**
Mean number of applications	0,95	0,91	0,95	1,08	**32,38**
Mean number of projects	1,12	1,04	1,00	1,15	**4,42**
MNCS	0,89	0,88	0,99	0,97	**0,94**
Publications	0,82	0,78	0,75	0,88	**3417,21**
Success rate	1,18	1,15	1,02	1,14	**0,13**
Partners					
ARWU	1,1	1,0	1,0	1,0	**490,0**
Centrality	0,98	0,93	0,81	1,05	**0,16**
EU funding (sum)	0,93	0,89	0,82	0,96	**879173,3**
EU funding per application	1,19	1,08	1,00	1,06	**26451,5**
EU funding per project	0,94	0,89	0,93	0,95	**153548,7**
Mean number of applications	0,88	0,84	0,84	0,91	**26,72**
Mean number of projects	0,94	0,89	0,80	0,96	**3,67**
MNCS	0,98	0,99	1,02	1,03	**0,78**
Publications	0,93	0,95	1,08	1,01	**2399,70**
Success rate	1,16	1,12	0,95	1,13	**0,13**

A.71 Space				
PRC, Collaborative project	NL	AT	SE	**NO**
Success rate	31,73	29,23	26,67	**25,71**
Partners per application	**0,98**	**0,97**	**0,71**	**9,69**
Applications (N)	104	65	45	**35**
Coordinators				
ARWU	**1,1**	**1,9**	**0,9**	**340,9**
Centrality	**2,16**	**1,72**	**1,08**	**0,09**
EU funding per application	**0,74**	**0,90**	**1,02**	**139513,1**
EU funding per project	**0,75**	**0,78**	**0,85**	**339907,0**
Mean number of applications	**2,20**	**1,57**	**1,02**	**13,37**
Mean number of projects	**2,35**	**1,75**	**1,03**	**4,51**
MNCS	**0,96**	**0,65**	**1,01**	**1,02**
Publications	**0,83**	**0,31**	**0,76**	**3543,49**
Success rate	**1,02**	**1,04**	**1,23**	**0,30**
Partners				
ARWU	**0,9**	**1,1**	**0,9**	**427,6**
Centrality	**0,90**	**0,98**	**0,60**	**0,13**
EU funding (sum)	**0,92**	**0,87**	**0,41**	**1871853,2**
EU funding per application	**0,92**	**0,97**	**0,85**	**86866,9**
EU funding per project	**0,92**	**0,91**	**0,90**	**201060,8**
Mean number of applications	**0,95**	**0,94**	**0,61**	**15,03**
Mean number of projects	**0,93**	**0,90**	**0,50**	**5,68**
MNCS	**1,06**	1,00	**1,06**	**0,86**
Publications	**1,16**	**0,97**	**1,09**	**2771,32**
Success rate	**1,02**	**1,06**	**0,99**	**0,33**

A.72 Space				
REC, Collaborative project	DK	**NO**	NL	FI	AT
Success rate	59,26	**45,90**	44,32	40,79	27,69
Partners per application	**1,16**	**12,59**	**0,95**	**0,88**	**0,89**
Applications (N)	27	**61**	88	76	65
Coordinators					
ARWU	**0,8**	**549,3**	**0,6**	**0,7**	**0,6**
Centrality	**1,09**	**0,22**	**0,85**	**0,96**	**0,90**
EU funding per application	**1,07**	**195133,7**	**0,75**	**0,85**	**0,56**
EU funding per project	**0,99**	**429321,8**	**0,77**	**0,84**	**0,64**
Mean number of applications	**1,05**	**22,98**	**0,93**	**1,08**	**1,10**
Mean number of projects	**1,16**	**9,43**	**0,89**	**1,06**	**0,99**
MNCS	**1,38**	**0,68**	**1,47**	**1,35**	**1,50**
Publications	**2,11**	**1169,89**	**2,75**	**2,24**	**3,08**
Success rate	**1,18**	**0,42**	**0,83**	**0,99**	**0,74**
Partners					
ARWU	**1,1**	**395,1**	**1,0**	**1,0**	**1,1**
Centrality	**0,95**	**0,19**	**0,92**	**0,93**	**0,81**
EU funding (sum)	**0,81**	**2525851,0**	**0,89**	**0,90**	**0,76**
EU funding per application	**0,89**	**129854,6**	**0,89**	**0,83**	**0,64**
EU funding per project	**0,85**	**258099,5**	**0,87**	**0,85**	**0,73**
Mean number of applications	**0,89**	**16,80**	**0,95**	**1,01**	**0,95**
Mean number of projects	**0,92**	**7,20**	**0,93**	**0,98**	**0,82**
MNCS	**0,99**	**0,91**	**1,03**	**0,99**	**0,91**
Publications	**0,99**	**3210,63**	**1,05**	**0,89**	**0,81**
Success rate	**1,16**	**0,46**	1,00	**0,97**	**0,80**

A.73 Transport (including Aeronautics)						
HES, Collaborative project	SE	AT	DK	FI	NL	**NO**
Success rate	33,45	29,73	29,03	24,66	23,19	**9,09**
Partners per application	**1,12**	0,97	**1,02**	**1,06**	0,91	**13,59**
Applications (N)	281	111	62	73	263	**22**
Coordinators						
ARWU	**0,6**	**0,9**	**0,8**	**0,8**	**0,5**	**588,79**
Centrality	**2,43**	**2,01**	**1,45**	**1,63**	**2,43**	**0,09**
EU funding per application	**3,27**	**2,44**	**5,63**	**4,52**	**3,24**	**34226,1**
EU funding per project	**1,76**	**1,45**	**2,12**	**1,78**	**1,73**	**164900,7**
Mean number of applications	**1,98**	**1,85**	0,91	**1,47**	**2,35**	**33,3**
Mean number of projects	**2,76**	**2,46**	**1,28**	**1,74**	**3,02**	**7,7**
MNCS	**1,23**	**1,02**	**1,22**	**1,14**	**1,36**	**0,79**
Publications	**2,23**	**1,26**	**1,74**	**1,97**	**2,41**	**1402,9**
Success rate	**2,33**	**2,04**	**2,23**	**1,79**	**2,01**	**0,14**
Partners						
ARWU	**0,9**	1,0	1,0	1,2	**0,9**	**479,24**
Centrality	**2,09**	**1,62**	**1,29**	**1,29**	**1,99**	**0,08**
EU funding (sum)	**2,92**	**2,32**	**1,45**	**1,48**	**2,95**	**1699623,7**
EU funding per application	**1,95**	**1,65**	**1,88**	**1,48**	**1,62**	**49471,2**
EU funding per project	**1,46**	**1,31**	**1,33**	**1,12**	**1,37**	**151181,3**
Mean number of applications	**1,92**	**1,66**	**1,13**	**1,13**	**2,19**	**22,0**
Mean number of projects	**2,42**	**1,90**	**1,31**	**1,30**	**2,41**	**5,9**
MNCS	**1,06**	**1,01**	**1,07**	0,91	**1,11**	**0,84**
Publications	**1,13**	0,94	**1,04**	0,76	**1,21**	**2468,6**
Success rate	**1,89**	**1,63**	**1,89**	**1,65**	**1,55**	**0,19**

A.74 Transport (including Aeronautics)						
PRC, Collaborative project	SE	DK	**NO**	NL	AT	FI
Success rate	36,72	32,97	**30,91**	29,00	28,63	28,41
Partners per application	0,80	**1,03**	**15,27**	0,95	0,88	0,96
Applications (N)	305	91	**110**	438	248	88
Coordinators						
ARWU	**0,7**	**0,8**	**512,0**	**0,7**	**0,8**	**0,80**
Centrality	**1,18**	**1,20**	**0,16**	**1,34**	**1,06**	**1,04**
EU funding per application	**1,69**	**1,59**	**99142,5**	**1,20**	**1,15**	**1,21**
EU funding per project	**1,26**	**1,15**	**274506,1**	**1,05**	0,92	**1,51**
Mean number of applications	0,90	**1,19**	**44,77**	**1,39**	**1,06**	0,97
Mean number of projects	**1,14**	**1,27**	**12,67**	**1,51**	**1,20**	**1,09**
MNCS	**1,13**	**1,02**	**0,92**	**1,09**	0,97	**1,02**
Publications	**1,52**	**1,34**	**2048,80**	**1,49**	**1,32**	**1,08**
Success rate	**1,30**	**1,07**	**0,27**	**1,09**	**1,05**	**1,09**
Partners						
ARWU	**0,9**	1,0	**483,8**	**0,9**	1,0	**1,31**
Centrality	**1,23**	**1,07**	**0,11**	**1,25**	**1,10**	**1,53**
EU funding (sum)	**1,39**	**1,40**	**2167486,9**	**1,73**	**1,49**	**1,12**
EU funding per application	**1,38**	**1,19**	**76721,5**	**1,11**	**1,05**	**1,07**
EU funding per project	**1,29**	**1,14**	**169903,9**	**1,15**	**1,08**	**1,11**
Mean number of applications	**1,14**	**1,24**	**23,13**	**1,47**	**1,28**	**1,04**
Mean number of projects	**1,27**	**1,20**	**7,34**	**1,47**	**1,28**	**1,02**
MNCS	**1,05**	**1,05**	**0,84**	**1,03**	0,98	**1,07**
Publications	**1,14**	**1,03**	**2445,08**	**1,06**	0,97	**1,04**
Success rate	**1,16**	**1,06**	**0,33**	0,99	0,97	1,00

A.75 Transport (including Aeronautics)				
REC, Coordination & support action	NL	AT	FI	**NO**
Success rate	45,76	40,38	35,71	**29,03**
Partners per application	**0,96**	**0,88**	**0,97**	**12,06**
Applications (N)	59	52	28	**31**
Coordinators				
ARWU	**1,0**	**1,2**	**1,6**	**428,7**
Centrality	**1,21**	**0,80**	**1,21**	**0,22**
EU funding per application	**1,59**	**1,12**	1,00	**80239,9**
EU funding per project	**1,22**	**0,91**	**0,90**	**253294,0**
Mean number of applications	**1,34**	**0,87**	**1,17**	**63,19**
Mean number of projects	**1,62**	**0,98**	**1,19**	**17,87**
MNCS	**0,99**	**0,88**	**0,75**	**0,93**
Publications	**0,61**	**0,53**	**0,38**	**3904,48**
Success rate	**1,20**	**0,94**	**0,96**	**0,32**
Partners				
ARWU	**1,0**	**1,0**	**1,2**	**439,8**
Centrality	**1,47**	**0,85**	**1,05**	**0,14**
EU funding (sum)	**2,21**	**0,84**	**0,96**	**3222828,6**
EU funding per application	**1,47**	**1,10**	**1,11**	**63202,6**
EU funding per project	**1,28**	**0,94**	**0,96**	**178123,0**
Mean number of applications	**1,56**	**0,81**	**0,99**	**36,72**
Mean number of projects	**1,72**	**0,89**	**1,04**	**10,99**
MNCS	**0,98**	**0,96**	**0,84**	**0,92**
Publications	**0,86**	**1,12**	**0,75**	**2924,61**
Success rate	**1,30**	**1,25**	**1,15**	**0,31**

A.76 Transport (including Aeronautics)						
REC, Collaborative project	FI	SE	NL	DK	AT	**NO**
Success rate	33,00	32,88	32,12	27,59	24,59	**23,93**
Partners per application	**1,05**	**1,06**	**1,02**	**1,18**	**0,86**	**14,59**
Applications (N)	100	73	386	29	122	117
Coordinators						
ARWU	**0,9**	**0,8**	**0,9**	**1,0**	**0,9**	**416,8**
Centrality	**1,26**	**0,87**	**1,44**	**0,61**	**0,89**	**0,22**
EU funding per application	**1,52**	**1,03**	**1,31**	**1,05**	**0,88**	**99944,1**
EU funding per project	**1,11**	**0,98**	**1,15**	**0,91**	**0,84**	**296205,4**
Mean number of applications	**1,16**	**0,74**	**1,53**	**0,52**	**0,95**	**60,9**
Mean number of projects	**1,20**	**0,80**	**1,67**	**0,59**	**0,98**	**18,1**
MNCS	**1,05**	**1,17**	**1,11**	**1,02**	**1,03**	**0,94**
Publications	**1,11**	**1,71**	**1,13**	**0,90**	**1,09**	**2727,7**
Success rate	**1,12**	**1,13**	**1,16**	**1,04**	1,00	**0,28**
Partners						
ARWU	**1,0**	**1,0**	**0,9**	**1,0**	**1,0**	**474,0**
Centrality	**1,26**	**1,25**	**1,58**	**0,84**	**0,96**	**0,12**
EU funding (sum)	**1,20**	**1,24**	**2,10**	**0,68**	**1,10**	**3045155,7**
EU funding per application	**1,12**	**1,24**	**1,38**	**1,27**	**0,95**	**73270,6**
EU funding per project	**1,05**	**1,11**	**1,29**	**1,05**	**0,96**	**184565,6**
Mean number of applications	**1,16**	**1,10**	**1,65**	**0,68**	**1,03**	**31,7**
Mean number of projects	**1,22**	**1,22**	**1,78**	**0,73**	**1,07**	**9,5**
MNCS	1,00	**1,05**	**1,06**	**1,01**	**0,99**	**0,83**
Publications	**0,91**	**0,96**	**1,04**	**0,87**	**0,98**	**2612,0**
Success rate	**1,19**	**1,29**	**1,23**	**1,29**	**0,98**	**0,29**

Table A.77 Mean funding received for each country per project

Funding per project to national institutions	Austria	Denmark	Finland	Netherlands	Norway	Sweden
Activities of International Cooperation	262213,8	144290,0	151590,8	158118,3	**118572,0**	121690,1
Climate action, environment, resource efficiency and raw materials	400753,0	421378,0	485856,7	912279,8	**776187,8**	816468,1
Energy	771365,9	979506,3	854710,6	690275,5	**808106,8**	623378,5
Environment (including Climate Change)	349317,0	430445,0	367608,8	638176,7	**552205,6**	481280,2
Europe in a changing world - inclusive, innovative and reflective Societies	360824,1	248612,7	374517,1	405528,9	**443842,9**	328652,9
Food security, sustainable agriculture and forestry, marine and maritime and inland water research	231902,3	465962,3	566584,7	719337,9	**428089,4**	581715,8
Food, Agriculture, and Biotechnology	344269,3	476831,5	421035,8	590136,6	**380504,2**	454223,0
Future and Emerging Technologies	583098,9	806885,9	655113,9	644432,8	**706800,0**	598279,2
Health	632084,1	654862,4	589292,2	941029,8	**528643,8**	755367,7
Health, demographic change and wellbeing	559430,2	785726,5	425005,4	1140535,4	**501049,2**	727712,9
Industrial Leadership	845621,8	611279,8	606994,5	854686,9	**1049707,5**	826614,3
Industrial Leadership - ICT	635872,3	728887,5	630367,8	837294,9	**657937,3**	752702,2
Industrial Leadership - Space	247865,7	302796,7	200636,6	371223,1	**515111,1**	754648,8
Information and Communication Technologies	550708,9	484130,6	544503,8	580624,7	**613414,6**	611391,2
Joint Technology Initiatives (Annex IV-SP1)	668131,1	605466,6	524428,7	1227051,5	**430964,5**	716256,5
Nanosciences, Nanotechnologies, Materials and new Production Technologies	504090,2	541907,6	584188,5	651981,9	**597031,8**	740841,9
Regions of Knowledge	352567,7	358942,6	455538,6	504908,2	**418808,5**	467882,7
Research Infrastructures (FP7)	248593,5	443541,1	338673,1	583846,1	**343676,2**	435223,7
Research infrastructures (H2020)	593358,8	441180,4	542267,3	821239,2	**642869,7**	1075066,5
Science in Society	251784,4	247500,4	178427,8	253725,4	**263088,1**	157688,5
Science with and for Society	249470,9	256333,1	151359,4	263918,6	**180717,1**	162125,8
Secure societies - Protecting freedom and security of Europe and its citizens	507021,0	330392,7	1120621,3	567247,7	**794528,2**	709478,5
Secure, clean and efficient energy	666041,6	1267148,0	1036107,4	1077439,1	**1131363,2**	1180596,2
Security	562140,5	433057,5	482600,5	613384,4	**472015,5**	949824,9
Smart, green and integrated transport	759797,0	1502203,2	645281,0	794563,1	**895256,7**	880214,6
Socio-economic sciences and Humanities	330365,1	256640,8	381742,7	433222,4	**248607,2**	331365,7
Space	319326,0	317164,5	387047,5	418232,9	**561791,0**	599228,6
Transport (including Aeronautics)	371041,5	403935,2	352705,0	466503,8	**421707,4**	600408,0

Table A.78: Comparison of PRC partners in FP7 applications coordinated by HES and REC institutions (red value = Norway has lower scores, green value = Norway has higher scores)

Energy	Centrality	Success rate	EU funding per project	Mean number of PRC partners per application	Applications (N)
Austria	0,026	0,24	120860,8	3,2	22
Denmark	0,057	0,44	290186,2	3,9	17
Finland	0,028	0,30	194217,7	3,3	24
Netherlands	0,043	0,35	163929,9	3,8	71
Norway	**0,087**	**0,36**	**238645,8**	**4,3**	**38**
Sweden	0,040	0,25	201476,3	2,9	46
Environment (including Climate Change)					
Austria	0,012	0,23	69863,8	3,0	71
Denmark	0,009	0,21	67865,9	1,8	68
Finland	0,009	0,15	39651,6	2,6	56
Netherlands	0,019	0,31	103202,6	2,0	196
Norway	**0,017**	**0,28**	**90547,3**	**2,1**	**75**
Sweden	0,013	0,23	82387,4	1,9	73
Food, Agriculture, and Biotechnology					
Austria	0,017	0,13	63348,4	3,6	61
Denmark	0,010	0,18	89188,3	3,3	106
Finland	0,010	0,22	79303,3	4,1	79
Netherlands	0,016	0,35	121746,1	3,6	198
Norway	**0,007**	**0,17**	**59021,7**	**3,7**	**61**
Sweden	0,007	0,13	30647,6	4,4	69
Health					
Austria	0,019	0,28	185096,3	2,5	99
Denmark	0,015	0,30	277997,5	0,9	128
Finland	0,014	0,22	217355,6	1,2	88
Netherlands	0,023	0,36	292623,4	1,2	528
Norway	**0,014**	**0,25**	**183789,6**	**1,2**	**32**
Sweden	0,017	0,27	297994,8	1,1	281
Information and Communication Technologies					
Austria	0,021	0,19	182870,5	2,7	366
Denmark	0,018	0,16	177397,1	2,7	159
Finland	0,018	0,14	134968,1	2,3	327
Netherlands	0,025	0,23	202971,7	2,2	449
Norway	**0,026**	**0,17**	**204783,8**	**2,8**	**188**
Sweden	0,022	0,16	176707,7	2,0	354
Joint Technology Initiatives (Annex IV-SP1)					
Austria	0,042	0,14	50283,7	3,0	11
Denmark	0,032	0,33	156911,0	2,5	14
Finland	0,054	0,26	143440,0	6,6	39
Netherlands	0,035	0,25	232486,2	2,2	58
Norway	**0,102**	**0,54**	**309864,8**	**5,3**	**19**
Sweden	0,080	0,41	89974,6	3,3	37

Nanosciences, Nanotechnologies, Materials and new Production Technologies					
Austria	0,013	0,46	159190,4	5,4	30
Denmark	0,014	0,38	176752,9	2,2	84
Finland	0,014	0,31	139771,3	2,8	164
Netherlands	0,019	0,42	183704,2	2,6	190
Norway	**0,012**	**0,32**	**155902,3**	**4,4**	**45**
Sweden	0,012	0,26	128384,3	2,7	185
Science in Society					
Austria	0,017	0,23	35738,4	0,8	28
Denmark	0,068	0,44	139615,3	0,5	6
Finland	0,033	0,13	30541,2	0,3	18
Netherlands	0,035	0,27	60348,1	0,6	30
Norway	**0,047**	**0,23**	**54966,2**	**0,4**	**18**
Sweden	0,017	0,25	101829,3	0,5	8
Security					
Austria	0,042	0,36	207431,6	2,8	35
Denmark	0,022	0,12	143461,1	2,7	23
Finland	0,024	0,16	133870,0	3,2	41
Netherlands	0,041	0,26	190709,9	4,0	68
Norway	**0,057**	**0,22**	**230411,1**	**2,8**	**24**
Sweden	0,057	0,29	213403,0	3,2	51
Socio-economic sciences and Humanities					
Austria	0,036	0,12	55772,9	0,7	93
Denmark	0,006	0,11	50736,4	0,4	39
Finland	0,029	0,05	26375,9	0,6	79
Netherlands	0,033	0,14	79573,8	0,4	154
Norway	**0,033**	**0,10**	**45910,6**	**0,4**	**74**
Sweden	0,020	0,02	17266,4	0,2	72
Space					
Austria	0,081	0,37	150192,9	2,2	19
Denmark	0,050	0,15	126694,5	2,3	10
Finland	0,047	0,39	175038,7	1,1	26
Netherlands	0,070	0,36	181296,4	1,8	25
Norway	**0,056**	**0,33**	**281350,6**	**1,0**	**14**
Sweden	0,019	0,44	120848,7	2,4	9
Transport (including Aeronautics)					
Austria	0,058	0,30	151567,5	3,9	44
Denmark	0,048	0,48	131744,1	2,7	12
Finland	0,042	0,29	100789,6	4,3	20
Netherlands	0,067	0,29	158370,1	3,6	119
Norway	**0,028**	**0,22**	**85317,3**	**4,6**	**26**
Sweden	0,062	0,26	131229,7	4,6	38