

Gathering Forces for Horizon Europe

Proposal for a national strategy for a
prominent Swedish participation



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Authors:

The Swedish Energy Agency, Formas, Forte, the Swedish National Space Agency, the Swedish Research Council and Vinnova.

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Preface

The importance of European framework programmes to Swedish research and innovation has increased continuously since their introduction. The programmes have been given increasingly large influence in the Swedish research landscape as the number of participating Swedish actors has increased and as the programmes have become a more significant source of research funding. The coming framework programme, Horizon Europe, is now in the early stages. This means new possibilities for knowledge and innovation to contribute to the transition and the social development required in Sweden, Europe and globally.

The successes of an EU framework programme are based on collaboration, which is a strong tradition here in Sweden. With a joint Swedish strategy, we can create the conditions for a participation in Horizon Europe that makes Sweden an even stronger nation in research and innovation. A participation that raises the quality of Swedish research and innovation, creates synergies and increases the benefit of Swedish research and innovation initiatives and which ensures that the contributions of research and innovation results in a sustainable development.

The government agencies that have developed this strategy proposal currently collaborate closely in their efforts to promote Swedish participation in the EU, and we will continue to develop and reinforce this collaboration in accordance with the suggestions presented in this report. We hope that a general Swedish strategy will also inspire and stimulate all types of actors to join us in contributing to a strong Swedish participation in Horizon Europe. We see a great value in developing a joint Swedish strategy, which is also expressed in our joint comment on the coming government bill relating to Swedish research and innovation.

During the process, opinions have been obtained from a variety of actors through interviews, surveys and a hearing. A sincere thank you to everyone who has contributed knowledge and valuable comments! We also want to thank all the government agency employees who have helped to produce this report!

Stockholm, 20 October 2020

Robert Andrén
Director-General
The Swedish Energy Agency

Ingrid Petersson
Director-General
Formas

Jonas Björck
Director-General
Forte

Anna Rathsman
Director-General
Swedish National Space Agency

Sven Stafström
Director-General
Swedish Research Council

Darja Isaksson
Director-General
Vinnova

Summary

Horizon Europe is the European framework programme for research and innovation to be implemented in 2021–2027. The programme will have a massive impact on researchers in Sweden and on the Swedish research and innovation system. The programme is essentially a continuation of Horizon 2020, with more research and innovation, a stronger focus on European partnerships, and with ambitious research and innovation missions to solve major challenges to society.

Horizon Europe will contribute to fulfilling visions of a healthy, fair and sustainable society. The programme is to contribute to reinforcing green growth and competitiveness in Europe, but also includes global targets to combat climate change and promote a sustainable development.

To maximise the benefit for Swedish research and innovation and to enable synergies and interactions between the national and the EU levels, the Government has tasked Formas, Forte, the Swedish National Space Agency, the Swedish Energy Agency, the Swedish Research Council and Vinnova to develop a proposal for a strategy for Sweden and for Swedish research and innovation actors.

The strategy proposals that have been developed are based on five ambitions. The participation in Horizon Europe must be driven by the ambitions to achieve: world-class research quality and innovativeness; knowledge and capacity to ensure sustainable development; effective sharing of resources and data; internationally attractive actors and environments; as well as increased influence in the European research and innovation policy, as well as the framework programme.

The ambitions must be maintained with the help of ten strategic goals and a number of measures recommended in the strategy proposal. All the goals relate to raising the level of ambition and reinforcing the Swedish participation in all parts of the framework programme – both operative and strategic. The first goals, which are of a more general nature, concern an increase in the number of granted applications and the total granted funding, as well as making Swedish actors competitive and attractive to partners. These are followed by a number of goals which are to guide the efforts to reinforce and improve the synergies with national initiatives and programmes; participation in the European partnerships; implementation and results; use of infrastructures; and finally campaigning and influence. In addition, there is a goal concerning an increase in Swedish participation in the expert groups of the European Commission and secondments to Brussels.

Fulfilling the goals requires measures and action plans. The strategy proposal recommends several measures to provide the foundation of action plans and contribute to the fulfilment of the strategic targets set by the actors of the research and innovation system. The recommended measures vary in terms of goal and direction. A general recommendation is for Swedish actors to develop targeted strategies for their own participation. The recommendations also concern inquiries to reduce various types of obstacles and develop strengths. Other recommendations relate to measures to support the processes relating to application and project implementation; developed financial support for various types of participation; tools to disseminate knowledge and sharing of data and information; and use of infrastructure and shared resources.

The strategy proposal also includes suggestions for how follow-up and evaluation is to be done to ensure implementation and to assess the level of goal achievement.

The strategy proposal has been developed by a work group consisting of employees at the participating government agencies. The basis of the strategy proposal is analyses of the Swedish participation in ongoing and previous framework programmes and of current national initiatives and programmes. Other important foundations are comments from actors made in an interview study, a survey study and an open hearing with some 350 participations from the entire research and innovation system. There were 67 people interviewed and the survey was answered by 272 respondents. The respondents represented universities and other higher education institutions, the business sector, regions, institutes, trade organisations and the public sector.

The government commission started in May 2020 and was handed over to the Government in October 2020.

1. Horizon Europe is of great significance to Sweden

Research and innovation play an increasingly important role in our possibilities of transitioning to a sustainable social development. The EU framework programme for research and innovation enables countries and actors to collaborate in developing scientifically founded knowledge and innovative solutions.

In 2021, the new framework programme Horizon Europe^{1,2} is launched, which is intended to run until 2027 with a planned budget of around EUR 81 billion.³ The programme entails substantial funding opportunities, extended international networks and knowledge exchange for Swedish research and innovation actors. In addition, the programme offers increased opportunities to participate in European collaboration projects for technology development and solutions to social challenges.

To ensure that Swedish actors⁴ benefit from the opportunities in the new framework programme, we need to gather our forces and set up strategies for how to maximise the participation. A general strategy is required for the entire Swedish research and innovation system, as well as strategies for its various components. Regions, sectors and industries as well as actor groups or individual actors need to carry out their own strategic efforts.

A successful Swedish strategy should depart from a high ambition level. The goal of the strategy must also guide a Swedish participation that exceeds the participation in earlier framework programmes. Thus far, Sweden's participation has been relatively successful given our size, but there are excellent conditions to improve even further. Particularly considering that Sweden is a strong innovation and knowledge nation, that collaboration between actors is an established method and that we have a high scientific and technological competence in the country.

1. <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1540387631519&uri=CELEX%3A52018PC0435>

2. <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1540387739796&uri=CELEX%3A52018PC0436>

3. In September 2020, the Council of the European Union set a budget awarding Horizon Europe EUR 80.9 billion at the 2018 price level and including money from the "pandemic recovery plan". The decision must be approved by the European Parliament before it can enter into force, which is planned for November 2020.

4. Swedish actors refers to actors who are based in Sweden, meaning those operating in Sweden, regardless of the owners' nationality.

A strong participation in Horizon Europe is an important condition for research and innovation in Sweden, and thereby for the fulfilment of our research policy goal.⁵ The goal states that Sweden is to be one of the world's foremost research and innovation countries and a leading knowledge nation. High-quality research, higher education and innovation is to promote social development, welfare and the competitiveness of the business sector. This in turn is to ensure that the social challenges we are facing can be handles, and not only in Sweden, but globally speaking.

The developed strategy proposal presented here is based on high-set ambitions and the goals have been set accordingly. The strategy proposal is also based on powerful measures, which include all actors operating in the Swedish research and innovation system, as well as their commitment and contribution in various forms. The strength of a general Swedish strategy lies in goal-oriented and cohesive action.

1.1 The Horizon Europe framework programme

Horizon Europe is described as a continuation of Horizon 2020, but with a few important changes based on the half-time evaluation carried out in 2017.⁶ It highlighted the need to reinforce funding for ground-breaking research, to rationalise the funding system and to encourage participation to a greater degree. Research and innovation also needs to make a greater impact, the international collaboration needs to be strengthened and transparency and citizen influence also needs to increase. These changes are intended to contribute to Horizon Europe fulfilling the vision of a healthy, fair and sustainable society.

The general goals for Horizon Europe are to

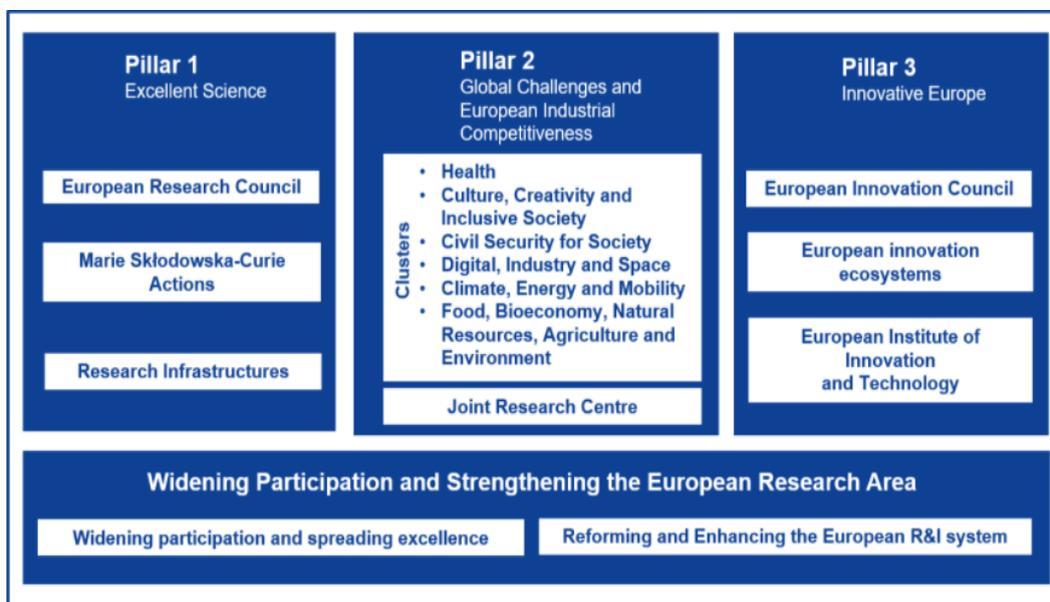
- strengthen the EU's scientific and technological foundation and the European research area;
- promote the EU's innovative capacity, competitiveness and job-creation;
- yield results in the matters essential to us all, i.e. defending our socioeconomic model and our values.

The programme is based on three pillars and one horizontal section (see image 1). The different pillars focus on 1) excellent science; 2) global challenges and European industrial competitiveness, and 3) innovative Europe. These three pillars form the basis of the programme and this is also where most calls and initiatives will be implemented. Most partnership programmes and missions are found under pillar 2. The horizontal section focuses on widening participation and strengthening the European Research Area (ERA).

5. <https://www.regeringen.se/regeringens-politik/hogskola-och-forskning/mal-for-hogskola-och-forskning/>

6. https://ec.europa.eu/info/publications/interim-evaluation-horizon-2020_en

Image 1: Structure of Horizon Europe



1.2 The mission, work process and design of the report

In May 2020, Forte, Formas, the Swedish National Space Agency, the Swedish Energy Agency, the Swedish Research Council and Vinnova were tasked with developing a strategy proposal for the Swedish participation in Horizon Europe (U2020/03335/F). The commission has entailed an analysis of the participation in earlier and current framework programmes, and a subsequent description of what should characterise a valuable and strategic Swedish participation in Horizon Europe. According to the commission (see Appendix 7 (N.B. Appendices are only available in Swedish)), the strategy proposal must also contain goals for a Swedish participation as well as recommendations for the realisation of those goals.

The background of the government commission is that funding from the framework programme is having a growing significance for the financing of Swedish research and innovation. In addition, an increasing proportion of the initiatives within the framework programme is requiring co-financing from national research budgets; a requirement that will only grow further. A strategy is thus needed that can provide support in the Swedish research and innovation system and ensure that Horizon Europe is beneficial.

The strategy proposal presented here is based on five ambitions. They reflect the ambitions and expectations that Swedish actors have expressed in various statements and dialogues. The proposal was produced in a process where the government agencies have

conducted analyses and knowledge compilations, which have then provided the basis for the strategy proposal. The ambitions, as well as the goals and measures, were formulated in workshops and other working group collaborations. Comments on the strategy have also been received through contacts with actors and stakeholders.

The point of departure for the process has been the reference material presented in the appendices or among the other references. One important basis for the strategy proposal is the analysis of the Swedish participation, award proportion and application rate presented in Appendix 1. Important comments have also been submitted by various actors in the Swedish research and innovation system. Such comments have primarily been made in interviews (see Appendix 5) and a survey (see Appendix 6). On 29 September 2020, an additional digital hearing was held with 350 participants, during which the goals were presented and discussed.

The report consists of a report and its appendices. In Chapter 2 of the report, we present the ambitions on which the strategy proposal is based. It also includes six sections on the goals and measures intended to ensure an implementation of the strategy. Chapter 3 of the report also includes suggestions for how follow-up and evaluation is to be done to ensure implementation and to assess the level of goal achievement. The appendices form a significant part of the report. There are seven appendices with analyses, compilations and information, which provide an important foundation for the strategy proposal.

The final report of the commission was submitted to the Ministry of Education and Research on 30 October 2020.

2. Ambitions and strategic goals for the Swedish participation in Horizon Europe

The Swedish participation in Horizon Europe needs to be driven by high-set ambitions if we are to truly benefit from the programme's potential. The strategy proposal presented here is based on five ambitions for Sweden's participation in the next framework programme. The ambitions have been developed within the scope of the commission.

The strategy proposal is based on the following ambitions:

- **World-class quality.** Participation in Horizon Europe, and the interaction between national and European initiatives are to contribute to ensuring a world-class research quality and innovativeness in Sweden.
- **Sustainable development through knowledge and capacity.** Participation in Horizon Europe will contribute to Sweden's and Europe's ability to meet societal challenges and adjust to sustainable development, as well as strengthening the global work towards goals in Agenda 2030.
- **Efficient sharing of resources and data.** Participation in Horizon Europe will ensure efficient use of resources. Through collaborative projects, costs for the infrastructures required for research are shared while access to test and demo facilities is made possible. Participation provides unique competencies at EU level and strengthens cooperation between cross-border research and innovation environments.
- **Internationally attractive actors and environments.** Participation in Horizon Europe will strengthen the capacity for inclusive collaborations between actors in different countries, between sectors, and between disciplines within the research and innovation system. Such a capacity makes Swedish actors sought-after partners and contributes to making Swedish research and innovation environments internationally competitive.
- **Increased influence and leadership.** Participation in Horizon Europe will strengthen Sweden's influence on the EU's research and innovation policy and the focus of the framework programme. It also leads to Swedish actors contributing to the EU's development to a greater extent.

To realise the ambitions above, clear goals that can guide strategic work at all relevant levels are needed. The degree of goal fulfilment can also provide important indications of how the implementation of strategy is developing. The strategy proposal contains ten strategic goals, all of which concern stronger Swedish participation in Horizon Europe.

The following sections describe these goals as well as proposals for a number of recommended measures which make it possible to meet the goals.

2.1 Strategic and ambitious Swedish participation

Strategic Goals:

- Sweden is among the leading participants in terms of approved applications.
- Sweden receives at least 3.7 percent of the total funds granted.
- Swedish players are internationally competitive and attractive partners.

Horizon Europe offers important opportunities for research and development (R&D) as well as opportunities for international cooperation and exchange of experience. Swedish participation in the framework programme includes contributions to European research and innovation, while at the same time providing important opportunities to strengthen and raise the quality of research and innovation in Sweden.

A stronger Swedish participation in Horizon Europe is dependent on Swedish actors finding it attractive to participate and seeing the distinct added value of doing so. These players must also be competitive in terms of obtaining funds and be seen as attractive partners both in Sweden and in Europe.

Regarding the stated objectives or strategies of individual actors for participation in Horizon Europe, the conducted survey shows that the majority of those who responded to the survey and who plan to participate in Horizon Europe have their own, or intend to develop, a strategic plan for participation (see Appendix 6). A strategy is not a guarantee of high-level of ambition but can be seen as an indication of aspiration and that plans of participation are being made by setting goals.

More approved applications from Swedish actors is one of the goals and can be seen as an intermediate goal to increase ambition which the strategy aims for. In Horizon 2020,

16 percent of the applications were granted, which is at the same level as the other member states. In comparison to Finland and Denmark, we have a higher approval rate, but when compared with Norway, Belgium, the Netherlands, Switzerland, and Austria, it is approximately two percentage points lower.

An increase in ambition with regard to Swedish participation also concerns increasing the volume and proportion of funds granted from Horizon Europe's total budget. With regard to Horizon 2020, 3.4 percent of the total approved funds go to Swedish R&D projects. That result is relatively strong, but given the existing needs for R&D, the result needs to be better.

With regard to the share of funds granted to Swedish players, a target of 3.7 percent is proposed here, which means a volume increase of approximately 10 per cent compared with the current level.⁷ This increase is justified by the increased need for research and development to ensure the work with sustainable societal development and fulfilment of the goals in Agenda 2030, both at national and international level. Such an increase is also considered reasonable as Horizon Europe's design and focus are well in line with Swedish areas of strength in research and development.^{8,9}

To enable increased participation, the conditions for Swedish actors to produce good applications and run successful projects need to be reviewed, while the targeted support efforts need to be refined and strengthened.¹⁰ This requires support before and during the application process, during the project, and after the project is completed, which is confirmed by the interviews and the survey (see Appendices 6 and 7). This may apply to early information initiatives in connection with announcements, assistance in the application process, and finding partners (nationally and internationally). This may also apply to supplementary financing for full cost coverage. Other important support concerns administration (where agreements and regulations regarding, for example, intellectual property rights and reporting of results to the EU are included), as well as support in the communication of results.

7. A comparison with equivalent or more successful countries does not provide unambiguous information about which goal is best suited for Swedish participation in Horizon Europe. A goal that states that Sweden must receive as large a share of the grants awarded per researcher in the country as Norway, means that Sweden's share of the grants awarded needs to be 5 percent. If the target is set to receive the same share as Germany (which is the country that receives the most funds from current framework programs), Sweden's share of granted funds would need to be 2.6 percent (see Appendix 2 for a description of the indicator for the relative acceptance ratio). The increase is also on a par with the announcement in the Budget Bill for 2021 (Government Proposition 2020/21: 1. The Budget Bill for 2021) for a strengthening of approximately 9 percent of the Swedish research and development system.

8. European Commission. European Innovation Scoreboard 2020.

9. The Swedish Research Council (2019). Research Barometer 2019.

10. Support means activities carried out within the framework of the tasks of the supporting authorities or support provided by national liaison officers in accordance with EU minimum standards and guiding principles for NCPs.

Different parts of the framework programme provide different conditions for participation and thus, the support may need to be adapted. One form is support in the form of training at the individual level prior to interviews for applications to the European Research Council¹¹ and the European Innovation Council.¹² At a more structural level, the support needed consists of incentives and support from within the higher education institutions to mobility.¹³ Workshops and joint-learning for coordinators and other actors on how to write competitive applications is another important form of support. This type of exchange can also support higher education institutions, regions, as well as small and medium-sized businesses. For collaborative projects where several partners are involved, special support is needed for coordinators or to put together consortia.

Recommended measures

- Swedish actors should develop their own strategies and action plans for their participation in Horizon Europe, based on their own ambitions and conditions. Like the proposed national strategy, these will also be followed-up and updated as necessary.
- Strengthen efforts aimed at making available and disseminating information concerning participation in Horizon Europe. This can be done by
 - developing the national function of the research funders (national liaison officers)
 - encouraging higher education institutions and other organisations to collaborate with others within their respective types of actors in order to develop adapted support
 - continuing the special investment in national support offices for small and medium-sized businesses.
- Analyse and investigate
 - the need for special support measures in areas where Sweden has an unexpectedly low participation rate and where there is potential for improvement
 - the need for support to ensure that Swedish actors find the right partners
 - the possibility of setting up supplementary funding for organisations, to cover part of the costs incurred in participating in Horizon Europe.
- Ensure that Sweden continues to work for a simplified application procedure for participation in Horizon Europe.

11. European Research Council, ERC. <https://erc.europa.eu/>

12. European Innovation Council, EIC. https://ec.europa.eu/commission/news/european-innovation-council-2019-mar-18_en

13. Applies to the Marie Skłodowska-Curie actions (Marie Skłodowska-Curie Actions, MSCA).

2.2 Strengthened conditions through coordination with national initiatives and programmes

Strategic Goals:

- Strengthened coordination with national initiatives and programs results in successful Swedish participation in Horizon Europe.

In Horizon Europe, it is clear that expectations of synergies between the framework programme's efforts and national efforts are higher than in previous framework programmes. In order to be able to use Horizon Europe as leverage for Swedish investments, key parts of the actors' strategies and action plans need to focus on areas and initiatives where Sweden is already well-positioned or has national investments. It should be a prioritised responsibility for all Swedish research and innovation actors to map their positions and clarify areas of strength. This applies to investments in increased research quality as well as prioritisation of specific research areas. This will make it possible for participating actors to identify potential synergies between national initiatives and Horizon Europe, as well as for research funders to implement national initiatives that provide leverage.

Special responsibility for taking advantage of synergies between the framework programme and national initiatives rests on targeted initiatives such as the Government's Strategic Cooperation Programmes¹⁴, the National Research Programmes (NFP)¹⁵ and the Strategic Innovation Programmes (SIP).¹⁶ These national research and innovation programmes have been established to meet societal challenges at both national and global levels. For effective Swedish participation in the framework programme, important interactions need to be identified and national efforts synchronised and coordinated. There also needs to be a plan for how any overlap should be handled.

In addition to the mapping of opportunities for coordination between initiatives and programmes, a clearer picture of the presence and network of different actors in Brussels is also needed. This is to create better opportunities for interactions between actors' activities and the framework programme. Swedish actors and representatives should, in relevant cases, ensure a more cohesive orientation in order to be able to proactively influence the work within the framework programme. In this way, the use of resources also becomes more efficient.

14. <https://www.regeringen.se/regeringens-politik/regeringens-strategiska-samverkansprogram/>

15. <https://www.regeringen.se/regeringsuppdrag/2017/06/uppdrag-att-inratta-nationella-forskningsprogram/>

16. <https://www.regeringen.se/regeringsuppdrag/2017/06/uppdrag-att-inratta-nationella-forskningsprogram/>

The existing coordination function for EU issues between the state research funders, EU-Sam, can serve as a platform for coordination and dialogue between the state actors and other actors.

Recommended measures

- The actors in the R&D system should, in their participation strategies, identify and map links as well as possible synergies and overlaps between their national efforts and Horizon Europe. This covers both general quality aspects and specific areas.
- Create an exchange of national programmes through national research programmes, Strategic Innovation Programmes, and the Government's collaboration programmes' support of the advocacy work and strengthen your activities with initiatives linked to the framework programme.
- Utilise the presence and network of Swedish actors in Brussels to a greater extent as a bridge and as an opportunity to create synergies between your own activities and the framework programme.

2.3 Developed participation in European partnerships

Strategic Goals:

- Swedish funders and researchers benefit from the European partnerships to strengthen and influence research and innovation in Europe.
- Swedish actors take leadership in European partnerships in Swedish areas of strength to create strong research and innovation environments.

European Partnership¹⁷ is a collective name for various collaborations between the European Commission, the member states and associated countries, as well as businesses and other stakeholders. The purpose is to link national and regional initiatives with Horizon Europe, and to enable global collaborations. A partnership is based on a common strategic R&D agenda. Funding from the Commission to the partnerships represents an important shift in national funding. The funding can apply to R&D projects, but also complementary activities and coordination that the participants themselves have difficulty paying for. In some cases, activities are carried out by the involved partners and in other cases, calls for proposals are opened to third parties who can then apply for funding for projects.

¹⁷. The name has been changed from "partnership programme" to "partnership" in Horizon Europe.

One of the partnerships' strengths is that European and global actors from different sectors can, together, meet societal challenges and gather strength around an emerging area of research or innovation. Another strength is that the collaborations are contractual, which strengthens the conditions for duration and depth. The Commission can contribute from the structural and investment funds as well as from other EU programmes. Within the partnerships, both regional and national actors and activities can be linked to their counterparts in Europe. The Commission also places very high demands on participation in partnerships, which establishes standards and raises the quality of activities.

The partnerships were introduced (then as the partnership programme) in the sixth framework programme and have gradually become an increasingly important part of Europe's research and innovation strategies. Since its introduction, Swedish research funders and other authorities have participated in a large number of partnership programmes within most areas and disciplines (see Appendix 1). As a result, working methods for collaboration have been developed, which serves as a valuable foundation to build upon. The business community has also entered into a partnership with the European Commission.¹⁸

The partnerships in Horizon Europe will be fewer, broader, and have a more ambitious approach than their counterparts in Horizon 2020. Horizon Europe's new structure for partnerships means that Sweden's participation must be adapted with a higher level of ambition and more strategic priorities. Therefore, there is potential for an interest on the part of the Government Offices of Sweden to coordinate and gain insight into the new partnerships, in the same way as has been done so far for the Joint Programming Initiative (JPI) in the form of the Swedish JP-group.

Swedish actors should be encouraged to participate in partnerships which are in line with Swedish priorities and they should be supported to take leading roles in the planning, construction, and implementation of activities within the partnerships, both as financiers and as executors.

In the cases and areas where Sweden currently has an active and driving role, it is important to work to ensure that this continues. Swedish actors should continue to take leadership or leading roles in relevant partnerships. Sweden intends to continue to coordinate a partnership on antibiotic resistance, which is one of the 49 partnerships proposed by the European Commission in 2020. Corresponding leading roles are deemed to be possible for a limited number of new partnerships in other strategic areas. Support from the government and the Government Offices of Sweden may be required for

18. <https://ec.europa.eu/programmes/horizon2020/en/partnerships-industry> och <https://ec.europa.eu/programmes/horizon2020/en/contractual-public-private-partnerships>

European leadership in partnerships within Horizon Europe of this scope. Other leading roles in sections of the partnerships, such as work packages, should also be sought. However, these are deemed to be manageable at the organisational level.

In other European countries, there are so-called mirror groups that have been created for individual partnership programmes. The mirror groups function as either guiding or reference groups where representatives of the areas concerned meet to coordinate national activities with participation in the partnership programmes.

The EU coordination function (EU-Sam), which consists of government research funders, has a central role in terms of the authorities' coordination of Swedish participation in the partnerships and for national funding of participation in the partnerships. Previously, in their joint contribution to the research bill, the financiers advocated a more proactive and strategic role for the coordination function.

Recommended measures

- Create conditions for strategic and synergistic action between national activities and partnerships. This is done by
 - ensuring that, within in the partnerships, Swedish coordinating partners build close cooperation with relevant national programmes and initiatives that enable and promote synergies.
 - establishing mirror groups within the area of each partnership based on needs and conditions.
- Ensure that the coordination function (EU-Sam) has the potential to take a more strategic role in order to be able to initiate and coordinate the work between the initiators of Swedish participation in European partnerships.
- Work to ensure that Swedish actors take leadership and strategic roles through their active participation in European partnerships in areas that are important to Sweden.

2.4 Increased utilisation of knowledge and results

Strategic Goals:

- Sweden is a strong nation of knowledge where the dissemination, accessibility and utilisation of the research and innovation, which is generated in Horizon Europe, increases the opportunities to meet societal challenges and strengthen the competitiveness of the business environment throughout Europe.

Projects within the framework programmes are granted under the terms of fierce competition, which results in maintaining a very high quality. Results from these projects must be disseminated in order for them to be of benefit outside of the current project and its purposes. Access to research-based knowledge is not just a matter of utilisation in terms of implementation in new R&D contexts or in the work for sustainable development. It is also a question of democracy because knowledge and information can increase individuals' and actors' opportunities for participation and influence.

Many of the framework programme's initiatives aim for societal benefits in broader terms. This applies to all sorts, regardless of whether it concerns research breakthroughs that contribute, only in the long run, to sustainable societal development, or whether it concerns more applied research and innovation that, in the short term, has the potential to contribute to societal challenges and competitiveness. Social benefit, in turn, demands that the framework programme's research and innovation be available to those who will use the results in the near future. Therefore, it is important to strengthen working methods that contribute to relevance by including the need owners and the recipients of project results in both the work with applications and in the implementation of projects. It is also important that decision-makers at different levels and their advisers have sufficient knowledge of the results generated within the framework programme and which can be used in policy contexts, i.e. in the development of regulations, instruments, and legislation. They should also know where the opportunities to be involved are greater, which areas Swedish actors are strongest or have leading positions, and how to make an impact so that the results match the knowledge needs that exist.

One consequence of the fact that societal challenges form a large part of the framework programme is that relevance and impact are given increasing scope in the preparation of the framework programme's call for proposal texts as well as in application evaluation. This is a development that is important for Swedish actors to understand and participate in. An understanding of the background of call of proposal texts is required in order to be able to create competitive applications and to contribute to strengthening the relevance and utilisation of the results generated in the framework programme's projects. It is also important that the intangible assets generated within the project are utilised in the best possible way. Furthermore, the need for dissemination and utilisation demands that R&D actors systematically follow-up their projects and therefore make it possible to identify results that can be utilised in a broader perspective. According to the conducted survey (see Appendix 6), only a few actors systematically follow-up results from the framework programmes, which indicates that there may be great potential for improvement.

Over the past fifteen years, the issue of open access to research results has become increasingly important both nationally and internationally.¹⁹ Such access refers to both scientific publications and research data. The transition to open access needs to take place in a dialogue between research funders, higher education institutions, and researchers in Sweden as well as abroad. A key aspect of the transition to open access is therefore to participate in and influence the discussions held in the EU.²⁰ An important issue in this context concerns the merit and evaluation systems within the academy and how these should be changed to promote the transition.²¹ At the European level, the transition to open access is being driven by, among others, the European Commission and organisations such as Science Europe. This is done, for example, through cOAlition S²², which is an international consortium that includes several Swedish research funders. The Commission supports several different bodies and platforms working for open science and which want to accelerate the transition to full and immediate open access to scientific publications and research data. Examples of such are the Research Data Alliance (RDA) and Plan S²³, whose principal members of cOAlition S have undertaken the task of implementation in a coordinated manner.

The government has assigned The Swedish Research Council the task of coordinating open access for research data.²⁴ A national strategy for open access to research data can form a basis for Sweden's cooperation within the European Open Science Cloud (EOSC).²⁵ Once a strategy has been developed, the necessary resources need to be set aside for implementation. The National Library of Sweden has a government mandate to coordinate open access to scientific publications at national level.²⁶

There are good conditions for strengthening national cooperation in order to communicate science-based knowledge. Here, research funders and higher education institutions play an important role, while in the R&D system there are existing platforms and organisations that can be used by the actors in the R&D system. One example of a platform is Innovation Radar²⁷, which is a digital tool developed by the initiative of the

19. The Swedish Energy Agency, Formas, Forte, the Swedish Space Agency, the Swedish Research Council, and Vinnova (2019). Research & innovation for the future.

20. Swedish Research Council (2020). Coordination of open access to research data.

21. KB Report 2019: Merit and funding allocation systems in relation to open access.

22. <https://www.coalition-s.org/>

23. Plan S is an open access initiative that requires all scientific publications from research funded by public or private grants provided by national, regional, and international research councils and funding bodies to be published in open journals, on open platforms, or made available immediately via open repositories without embargo from 2021.

24. <https://www.vr.se/uppdrag/oppn-vetenskap/oppn-tillgang-till-forskningsdata.html>

25. <https://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud>

26. <https://www.kb.se/samverkan-och-utveckling/oppn-tillgang-och-bibsamkonsortiet/oppn-tillgang.html>

27. <https://ec.europa.eu/digital-single-market/en/innovation-radar>

European Commission. The tool will be used to identify important innovations and the actors behind them, among R&D projects that have EU funding. Networks and intermediaries can also be seen as a kind of platform for research communication.²⁸

Popular science communication of project results also contributes to increasing the benefits of research and innovation for society. Through a wider dissemination of knowledge within society, the understanding of how research and innovation can be useful will increase, which can also be seen as an important issue of democracy.

Recommended measures

- Develop processes, infrastructures, and digital tools for higher education institutions and authorities that make it easier for actors to make available, disseminate, and utilise project results.
- Develop initiatives and incentives so that Swedish researchers and need owners take part in the knowledge generated in Horizon Europe and contribute to utilising it. This includes targeted efforts to increase the knowledge and understanding of decision-makers at various levels. Such knowledge concerns the type of results generated within the framework programme, as well as different ways of influencing the design of the results so that they can be useful in policy contexts.
- Take advantage of the collaboration with civilian society to an increasing extent and strengthen the citizens' commitment to research. Swedish actors should actively participate when possible to create interest, understanding, and confidence in the research process and scientific facts.
- Ensure Sweden's continued participation in the EU Commission's Innovation Radar initiative, which aims to make results from successful EU-funded projects available.
- Ensure that Swedish efforts benefit from the framework programme and vice versa in order to promote open access to research data and publications. This can be done, for example, through the participation Swedish actors in initiatives such as the European Open Science Cloud (EOSC) and cOAlition S.
- Promote open access and push for the system to be changed at both Swedish and European levels, for example by developing recommendations for incentives for open access.

²⁸. Such as the Network of Research Authorities; Science & Public; Forskning.se.

2.5 Increased usage of the research infrastructure and strong R&D environments

Strategic Goals:

- Swedish actors benefit from and contribute to research infrastructures, strong environments, and test demonstration facilities in Europe.

Research infrastructures are used by Swedish actors and the business community in all scientific disciplines and innovation areas. They have increasingly become an important prerequisite for excellent and high-quality research as well as for innovation and technology development. Being a part of the contexts that international infrastructures constitute contributes to increased visibility of Swedish research and technology. This also facilitates Swedish participation in international collaborations and in research and innovation projects.

Research infrastructure includes facilities, instruments, knowledge collections, and services, with the help of which experiments, calculations, and observations can be made. These include large and advanced facilities such as Erange, Max IV and ESS.²⁹ Important infrastructure also includes digital infrastructure, i.e. the infrastructure that makes it possible to generate, store, and share data that is important for R&D, which aims for digitisation and is dependent on large amounts of data.³⁰ Several organisations and authorities in Sweden, for example, have expressed an interest in becoming members of the European Open Science Cloud (EOSC).

Test beds also constitute infrastructure and are an important resource in the R&D context. These include everything from advanced analysis equipment and pilot facilities to policy labs and virtual development environments. According to the European Commission, the strategic development of test beds is important to enable more efficient use across national borders.³¹ Test beds are important especially for small and medium-sized companies that need quick access to opportunities for testing innovative solutions, but also for large companies and the public sector.

Research infrastructures are of great importance for all parts of the framework programme and a matter of urgency in many R&D contexts. The research infrastructures need to be more visible and useful to the actors in Horizon Europe.

29. <https://www.regeringen.se/rattsliga-dokument/skrivelse/2018/05/en-nationell-strategi-for-ess-och-den-omgivande-kunskapsmiljon/>

30. <https://ec.europa.eu/digital-single-market/en/european-digital-innovation-hubs-digital-europe-programme-0>

31. https://ec.europa.eu/commission/presscorner/detail/sv/ip_20_1749

This means that funds outside the framework programme need to be secured to finance research infrastructure and support staff. It also means that there needs to be good access to the infrastructure and good conditions for an international exchange of researchers and support staff for European research infrastructure as well as a lowering of the threshold that Swedish actors experience for participation in technology development projects.

Many research infrastructures conduct innovation projects where new technologies are tested to develop future equipment. Participation in these projects is open to companies and research environments from member countries and the parties must co-finance their participation.

In 2018, the Swedish Research Council stated in its guide to infrastructure that it is of great importance that Sweden participates in international collaborations for research infrastructures, mainly within the EU and the framework programmes. The Swedish advocacy work for investments in research infrastructure in Horizon Europe should be based on existing strategic priorities and recommendations. For example, to work long-term to coordinate investments in infrastructure, that research should be a guide for investments in infrastructure, and to strengthen competence development of researchers and support staff.³²

Research infrastructures need to be used cost-effectively, not least because they often involve large investments. Sweden therefore needs to continue to continuously review its membership in European and international research infrastructures.³³

We need to ensure that research infrastructures of which Sweden finances are used for science and innovation. At the same time, there are other important opportunities. This may involve the development of more process-oriented knowledge that is linked to the development of new technology and tech-transfer. It may also involve the development of the skills which are needed along with support from the infrastructures in order to strengthen and develop important areas.

Recommended measures

- Secure funding of research infrastructures and its availability for all research areas by, among other things, promoting the international exchange of researchers and

32. The Swedish Research Council (2018). The Swedish Research Council's guide to infrastructure2018.

33. Ibid.

support staff for European research infrastructures and by ensuring the necessary budget for this is completed.

- Ensure that Swedish companies and researchers can participate in international innovation and development projects linked to the development of technology for national and international research infrastructure.
- Ensure that Sweden uses the research infrastructure for scientific purposes, for foundational research, and for other relevant purposes that in a more direct way affect societal challenges, competitiveness within the industry as well as innovation. Increase awareness in Sweden of these opportunities and create conditions for participation.

2.6 Successful advocacy work and expert support

Strategic Goals:

- Swedish actors actively and successfully influence Horizon Europe in terms of focus, content, and implementation.
- Participation in the EU Commission's expert forum is attractive to Swedish actors, whose participation in expert forums has increased in scope and importance.

The influence of Sweden and Swedish actors needs to increase in order to strengthen Sweden's participation in the framework programme itself, but also to increase the influence on the EU's research and innovation policy and thereby contribute to the EU's development. In order to be able to influence future priorities, impact work is needed within each sub-program, as well as impact on the design of the missions and other parallel initiatives. The Commission's work in the framework programme relies greatly on various expert groups³⁴ for advice and expertise. These expert groups are therefore important arenas for Sweden's advocacy work.

The production of calls for proposals and other activities within the framework programme are largely carried out by the European Commission, which draws input from various actors. The design of the calls is then discussed by different programme committees depending on the area. Each of these committees contains Swedish representatives consisting of one or more members from the Government Offices of Sweden and one or more experts from relevant authorities. The views expressed by Sweden in each programme committee are intended to secure Swedish interests.

34. <https://ec.europa.eu/programmes/horizon2020/en/experts>

Swedish interests mean that the call for proposals must be in-line with the political priorities decided by the Riksdag and the Swedish government. It also means that the calls must be relevant for Swedish research, for Swedish societal challenges and for Swedish business. The calls for proposals will also offer Swedish actors good opportunities and interest in participating. In order to obtain viewpoints from the Swedish system, the experts in the programme committee have a reference group.

Another important way to participate in the prioritisation and design of new initiatives in the framework programme is to utilise the opportunity to second. This involves the placement of Seconded National Experts, which are funded by Sweden, on the European Commission. National experts can contribute their expertise to the Commission while Swedish interests in the EU are promoted and knowledge about the EU can be disseminated in Sweden. In their joint contribution to the research bill, the research funders have proposed an opportunity to finance such secondment with joint funds.

Within the framework of Horizon Europe, parallel missions are initiated and interdisciplinary initiatives to meet societal challenges, strengthen the competitiveness of business and contribute to systems innovation.³⁵ As missions are new to Horizon Europe, it is important that Sweden is involved in influencing the design of the missions, but also that various actors actively participate in the research and innovation projects that will contribute to the fulfilment of the mission's goals.

The framework programme is an instrument for realising the European Research Area (ERA), which aims to establish a common European market for research, where the free movement of researchers, scientific knowledge, and technology can contribute to strengthening Europe's competitiveness. Sweden's national roadmap for 2019–2020³⁶ includes work in the structure of research systems, societal challenges, research infrastructures, the labour market for researchers, gender equality, open science, and international collaboration. In the autumn of 2020, the European Commission presented a proposal for the future ERA³⁷ with the aim of: prioritising investment and reforms; improving access to excellence; translating research and innovation results into the economy; deepening the European Research Area. These proposals are well in-line with the ambitions and proposals in this strategy.

35. https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme/missions-horizon-europe_en

36. The Government Offices of Sweden (2019). National roadmap for the European Research Area 2019–2020.

37. New era for the European Research Area COM (2020) 628 final.

Sweden's roadmap for the ERA will therefore need to be updated. In this context, it is important to take into consideration the UK's withdrawal from the EU, which means that Sweden's ERA roadmap will also include efforts to strengthen and develop the research collaborations that currently exist between Sweden and the UK.

International R&D collaborations with third countries are included to varying degrees as a cross-cutting element in the different parts of Horizon Europe. Here, the Swedish advocacy work can be strengthened by taking advantage of the research funders' international coordination function (Intsam) and its connection to the contacts within the Swedish innovation and research councils. This concerns contacts with countries outside the EU and with the EU country leaders for these countries and regions.

In addition to the advocacy work that takes place through the programme committees and its reference groups, there is important work within various networks and expert and policy groups. For example, in most areas there are advisory groups, technology and / or technology and innovation platforms,³⁸ as well as other groupings. Advocacy work via these forums are examples of how higher education institutions, businesses, authorities, civil society, municipalities, and regions can be involved in influencing future calls for proposals.

The advocacy work should be conducted throughout the framework programme and adapted to the different phases of the programme. In the start-up of a new framework programme, it is important to safeguard the structure of the framework programme. A good balance is needed between basic research, applied research, development activities, and innovation. At the end of the framework programme, it is important to draw conclusions from lessons and experiences and thereby initiate qualified discussions on how future programmes should be planned. During the first half of 2023, Sweden will hold the presidency of the EU, which may provide further opportunities to focus on the potential that research and innovation have in Sweden.

Recommended measures

- Strengthen the Swedish advocacy work on the framework programme by
 - Developing common points of departure and goals; strengthening coordination and information sharing between the Government Offices of Sweden, experts on the programme committees, and the actors in R&D systems, within the programme committee work and the design of the missions.

38. European Technology Platforms (ETPs) or Technology and Innovation Platforms (ETIP) are groupings within different industries, which The European Commission sees as key players in driving innovation, knowledge transfer, and European competitiveness. ETP or ETIP develops research and innovation agendas and roadmaps. The platforms are independent and self-financing units. They conduct their business in an open manner and are open to new members.

- taking advantage of the opportunities that the Swedish EU Presidency provides in the first half of 2023 to strengthen influence and create confidence in leadership.
- promoting the participation of Swedish actors in advocacy work through various networks, expert and reference groups.
- Map and analyse obstacles and conditions for the participation of Swedish actors' in expert groups.
- Ensure that the strategies and action plans developed by individual actors include plans to the extent to which employees are able to participate in expert groups.
- Provide continued opportunities for collaboration with leading British researchers and innovators by working to give the UK the opportunity to participate in Horizon Europe as an associated country.
- Facilitate the secondment of staff to EU institutions, for example by providing EU co-operation with increased funding for this purpose, so that financiers and other public actors can receive financial support for seconding staff.

3. Follow-up of the strategy

A successful strategy is based on the fact that it is well substantiated by facts and quality-assured analyses and that the implementation is done with the support of continuous follow-up, evaluation, and regular updates. This report presents a proposal for a strategy for gathering forces for Horizon Europe. The proposal includes goals for participation as well as recommended measures that are directly or indirectly expected to contribute to goal fulfilment.

Goal fulfilment needs to be evaluated on an ongoing basis and followed-up with the help of indicators, follow-ups, and evaluations (see Appendix 2). The purpose of such follow-ups and evaluations is to provide a clear picture of how the strategy work is developing as well as the outcome of the activities and measures. Both follow-up and evaluation shall aim to provide a basis for the efforts made during the programme period and to ensure that the outcome is in-line with the Swedish strategy.

A national strategy should be continuously followed-up by the government and each actor should, respectively, follow-up their own strategies or action plans. The goal should be to investigate the results of the measures, but also to evaluate different outcomes. Decisions concerning new initiatives and investments shall be based on analyses of effect and added value in relation to costs.

In addition to follow-up and evaluation, external monitoring and other analyses are also required. External monitoring should, for example, include analyses of other countries' strategies, as they are important for the priorities that are set and for how collaboration and strategic initiatives are designed. Amongst the recommended measures in this report are analyses and investigations that will make it possible to better understand the conditions for strong Swedish participation. Surveys, for example.

It is important that the Swedish strategy is kept current and is updated regularly. Such an update shall be based on evidence-based data compiled with the help of follow-up, evaluation, analysis, and external monitoring. This ensures that Sweden's investments in Horizon Europe provide the best possible exchange and benefit, that unfavourable investments are avoided, and that participation is in-line with the increasing ambitions for Sweden.

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