



Vetenskapsrådet

THE EUROPEAN SPALLATION SOURCE – A WORLD-LEADING TOOL FOR RESEARCH, EDUCATION AND INNOVATION:

THE SWEDISH RESEARCH COUNCIL'S PROPOSAL FOR A STRATEGY FOR SWEDISH PARTICIPATION IN AND HOSTING OF ESS



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THE EUROPEAN SPALLATION SOURCE – A WORLD-LEADING TOOL FOR RESEARCH, EDUCATION AND INNOVATION

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FOREWORD

The Government mandate U2014/3980/F entails “stimulating Swedish participation, use and skills supply in the construction and operation of the European Spallation Source (ESS)”. The mandate stretches through May 2019, with interim reporting in May 2016. The mandate includes producing a strategy for Swedish participation in and use of ESS to promote aspects such as skills supply and recruitment of neutron users, as well as research and technology development.

This proposal for a national strategy (hereafter called the “Strategy for ESS in Sweden”) includes both opportunities and challenges for the Swedish hosting of ESS. It is about how Swedish actors can participate through research, development and deliveries related to ESS. The work on producing the strategy has been carried out in close collaboration with a reference group chaired by Karin Markides and including representatives from academia, business and public authorities. The strategy stretches until 2030, and shows opportunities associated with ESS and synergies with Max IV, the synchrotron light facility in Lund, which will soon be opened. The strategy also makes proposals for measures to increase the impact of the Swedish inputs.

The internal work within the Government mandate of producing a proposal for a strategy for ESS in Sweden was led by Camilla Jakobsson, who has collaborated with Leif Eriksson as editor of the strategy. Eva Barkeman did the proofreading. An internal steering group consisting of Ann Fust/Jonas Björck, Jan Bolin, Lars Kloo, Björn Halleröd, Sofie Björling, Mikael Jonsson and Johan Holmberg has monitored and supported the work.

I would like to express warm thanks to all who have contributed to the Strategy for ESS in Sweden, and I look forward with confidence towards the continued development of ESS, and with the hope that this proposal will inspire more people to carry out more work!

Stockholm, May 2016

Sven Stafström, Director-General, Swedish Research Council

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THE EUROPEAN SPALLATION SOURCE – A WORLD-LEADING TOOL FOR RESEARCH, EDUCATION AND INNOVATION:

The Swedish Research Council’s proposal for a strategy for Swedish participation in and hosting of ESS

Gaining knowledge about fundamental physical conditions, investigating the characteristics of existing materials, inventing and improving various types of materials in order to understand biological process for refining plants and curing diseases are intimately associated with human history. The most revolutionary aspect is perhaps how the development of new materials have impacted on the transfer of knowledge – between individuals, between subject areas and between cultures, and over time. Examples worth mentioning are clay tablets for cuneiform writing, paper for manuscripts and printed books, and also today’s electronics that form the basis for digital media. Studies and developments of materials have had a crucial impact on the development of humanity, and will continue to play a major role in finding solutions to many of the great challenges of our times.

Facilities for advanced study of molecules, and the materials and processes related to them, can contribute to better understanding of new discoveries and to efficiency improvements within a number of areas, such as medicine and health, climate and transport, energy and environment, and also foods and cultural heritage. Research and development play an ever more important role in the management of societal challenges. In early 2016, the Swedish government began the work of achieving the UN’s defined global goals within Agenda 2030, which integrates the three dimensions of sustainable development; the economic, the social and the environmental dimensions. This will require a challenge- and knowledge-driven conversion. According to the agreement between the countries of the world, the goals shall be fulfilled by 2030, which opens up extraordinary opportunities for revolutionary research breakthroughs at ESS.

Sweden has shouldered a very great responsibility for the European Spallation Source, ESS, which is now being constructed in Lund, next to the synchrotron light source Max IV. The facilities are each expected to provide unique opportunities for research and development, at the same time as together constituting a competency cluster with global attraction, by offering complementary technologies. A joint assessment of the effects of the investment will only be possible after a few years of operation, but follow-up of activities related to the facility and its impact on research, education and innovation must begin already today.

The journey up until 2030 will be challenging and filled with both opportunities and obstacles that require continuous follow-up and measures to maximise the benefit of the investment. Already this year, 2016, a major step forward for research and development is taken when the world’s most advanced synchrotron light facility based on innovative Swedish technology, Max IV, is opened on the lightest day of the year.

About the strategy

The Government mandate U2014/3980/F entails “stimulating Swedish participation, use and skills supply in the construction and operation of the European Spallation Source (ESS)”. The mandate stretches through May 2019, with interim reporting in May 2016. The mandate includes producing a strategy for Swedish participation in and use of ESS to promote aspects such as skills supply and recruitment of neutron users, as well as research and technology development.

This proposal for a national strategy (hereafter called the “Strategy for ESS in Sweden”) includes both opportunities and challenges for the Swedish hosting of ESS. It is about how Swedish actors can participate through research, development and deliveries related to ESS. The work has been carried out in close collaboration with a reference group including representatives from academia, business and public authorities. The strategy stretches until 2030, and shows opportunities associated with ESS and synergies with Max IV. It also makes proposals for measures to increase the impact of the Swedish inputs. These measures must span

time (short-term and long-term), geography (national, linked to strengths in regions and attraction in the world), and sustainability (goals, working formats and responsibilities in collaboration).

Early proposals for measures

The most important first measures in the Swedish Research Council's proposal for a strategy for ESS in Sweden, at overarching level, are as follow. More proposals are available in the action plan (not available in English).

- **Create a coordinating instance at Government level**

The Government should already in 2016 identify an actor at Government level with the assignment to act as a coordinating instance for bridging various policy areas and the large number of actors who are already active with preparations for ESS. Examples of measures spanning the responsibility areas of several ministries and public authorities are strengthening the commitment among the country's higher education institutions (HEIs), facilitating recruitment of international competencies, increasing the participation by business and using the potential of developing the area around ESS and Max IV as a national knowledge and innovation environment.

- **Create a national science park for the innovation environment**

The knowledge and innovation environment surrounding ESS and Max IV shall be coordinated by a non-profitmaking national actor (such as a facilitating science park) that gathers together the participating HEIs and other actors. The collaboration shall be based on and support the actors strengths, existing meeting places and collaboration partners within the private and public sectors. The extended responsibility thereby undertaken by these HEIs should be supported by basic funding by the state. The development of a facilitating science park should be carried out in collaboration with the bodies responsible for development in the regions that are active today, and that are open to changes over time. All types of companies of relevance to Sweden that manufacture products dependent on material performance should be attracted to participate actively in the environment. The role of the research institutes should also be clarified in the national meeting place surrounding ESS and Max IV, and in the longer term at each HEI.

- **Encourage actors to make proposals concrete**

Encourage the actors with main responsibility for the challenges in the action plan (not available in English) in the Strategy for ESS in Sweden to develop action and time plans as soon as possible where the proposals in the strategy are made concrete. These action plans shall involve all the relevant collaboration partners.

- **Task HEIs to develop strategies**

Task HEIs to develop their own goals and strategies for how to benefit from ESS within research, education and utilisation. This applies in particular in areas where the HEIs have strategic environments (SFOs), skill centres, leading research infrastructures, collaboration with the business sector, other external strategic collaboration or similar, and where there are synergies with Max IV.

- **Facilitate employment**

Review policies, laws and regulations for the purpose of facilitating recruitment of the necessary skills needed for these new facilities for research and development. This includes developing support for mobility and the establishment and development of companies, but also creating incentives for these highly skilled persons and their relatives who are considering relocating to Sweden, or who are already here, to choose to stay here and work in the country.

- **Involve the business sector**

The Swedish business sector shall benefit from ESS and Max IV, both as suppliers to and users of the facilities, and as recipients of the results generated. The participation of business should be based on the strength that collaboration between academia and industry entails, that is to say use and develop the working

formats and the collaboration that is already working. In addition, consider tasking a new or existing actor to promote technology development relating to high-technology infrastructure facilities to further enhance the prerequisites for business sector participation.

- **Follow up**

The government should regularly follow up the Swedish commitment to ESS, its effects and how the strategy impacts on various sectors and regions in Sweden.

Framework

This strategy is conditional on ESS becoming the world-leading international infrastructure promised by the ambitious goals. The strategy is based on a vision, a mission and overall goals, as well as prioritised interim goals for opportunities arising from ESS. The strategy is complemented with an action plan (not available in English) to be followed up every year, based on the challenges identified. The proposals in the action plan are concretised through the actors responsible being encouraged to describe suitable measures, including opportunities and risks. While the strategy for ESS in Sweden spans 15 years, the action plan shall be supplemented and updated annually.

The strategy comprises the following parts:

- Vision and mission
- Overall goals
- Prioritised interim goals
- Delimitation

The Swedish version of the strategy also includes:

- Appendix A: Action plan with description of the process for annual follow-up, identified challenges and persons responsible, plus examples of ongoing activities.
- Other appendices:
 - B. Mapping of stakeholders and persons responsible
 - C. Acronyms and glossary
 - D. Reference group
 - E. Government Mandate U2014/3980F

A STRATEGY FOR SWEDISH PARTICIPATION IN AND HOSTING OF ESS

Vision

ESS in Sweden – a world-leading knowledge environment for the sustainable materials of the future.

Mission

Sweden shall work towards a strong national scientific foundation for users from academia, the business sector and institutes to utilise the opportunities of ESS and synergy effects with Max IV.

Sweden shall work towards a scientific culture at ESS based on openness and trust.

The Swedish business sector shall reinforce its competitiveness by being active at the facilities as suppliers to their development, as users for their own development and/or as recipients of results in collaboration with other actors.

Sweden shall work towards ESS being further developed in line with the needs and advances of science.

Overall goals

As host to ESS, Sweden has created a world-leading knowledge environment, based within materials science in a broad sense, which reinforces Swedish research and competitiveness.

By 2030, Sweden shall be the first choice for researchers, companies and institutes who wish to use the opportunities afforded by ESS and Max IV to address the great challenges of our times by investigating and understand the structure and dynamics of molecules, materials and objects.

Prioritised interim goals

In order for Sweden to benefit from one of Europe's largest facilities for research and development being built in our country (and adjacent to our greatest national research infrastructure), the following prioritised interim goals will be the starting point for an annual strategy process. The prioritised interim goals are closely linked to each other and are conditional on collaboration between academia, the business sector and other actors.

1. As host country, Sweden shall assume long-term responsibility for ESS to ensure the potential of the facility and the co-location with Max IV are utilised.
2. Sweden shall promote the use of neutron scattering for research and development, to ensure Swedish academia and the business sector relevant to Sweden benefit.
3. Sweden shall create a globally attractive knowledge and innovation environment, with ESS and Max IV as the corner stones.
4. The Swedish business sector and academia shall act as suppliers to ESS, and thereby benefit from the technology and competency development this entails.

Description of prioritised interim goals

1. As host country, Sweden shall assume long-term responsibility for ESS to ensure the potential of the facility and the co-location with Max IV are utilised.

As host country, Sweden has particular responsibility to ensure ESS is developed to its full potential, through factors such as balancing scientific and financial interests. The hosting, of both ESS and Max IV, entails long-term undertakings and needs to be developed in line with the facilities.

As host country, Sweden has a responsibility to follow up the development of ESS continuously and to propose or undertake suitable measures to achieve the overall goal of the investment.

1.1 In order to bridge various policy areas and the large number of actors who are already active, the Government should institute national coordination at Government level as soon as possible in 2016. Examples of measures that span the responsibility areas of several ministries and public authorities are working to reinforce the commitment among Sweden's HEIs, facilitating the recruitment of international competency, increasing the participation of the business sector and utilising the potential of establishing the area between ESS and Max IV as a national knowledge and innovation environment.

1.2 Together with the other member states, Sweden shall ensure that ESS develops into – and remains during its expected operational life – a world-leading infrastructure for research and advanced development with the aid of neutron scattering. The host country has a special responsibility to work towards the overall goals for ESS being fulfilled.

1.3 As host country, Sweden shall work towards research in all areas where neutron scattering and complementary technologies can provide added value being developed in the long term, and that the potential of the Swedish business sector to contribute to efficient operation and effective development of ESS is utilised.

1.4 Research involving neutron scattering at Swedish HEIs shall be promoted with the aim of setting the tone for research at ESS. Collaboration towards new areas, between HEIs and other relevant actors, shall be encouraged.

1.5 Sweden shall work towards existing structures, for features such as data networks, calculation and storage, being used and integrated in the development and use of ESS.

1.6 Sweden shall work towards ESS and Max IV attracting investment from the international business sector and research-intensive industry. The indirect effects caused by the establishment of ESS and Max IV shall be utilised in processes such as the development of the adjacent knowledge and innovation environment linked to corresponding environments around participating HEIs in Sweden.

1.7 The potential for collaboration between ESS and Max IV, and between the researchers who use both facilities, shall be utilised.

1.8 As host country, Sweden shall work towards developing projects that may facilitate efficient use of the facilities.

1.9 As host country, Sweden shall work towards prioritisations and decisions being made with the best interests of science in mind, and with the greatest possible transparency.

1.10 Sustainable development – social, ecological and financial – shall be taken into account both during the development and the use of the facilities.

1.11 The development of ESS shall be followed up and documented continuously.

2. Sweden shall promote the use of neutron scattering for research and development that favours academia and the business sector of relevance to Sweden.

Swedish HEIs are central to the country's research and development. The fact that the spallation source ESS is being constructed in Sweden gives the HEIs very good opportunities to reinforce or build up research within areas that may use ESS, and preferably also complementary techniques at Max IV. Already during 2016 and within the framework of their mandates, HEIs should draw up a goal description and a number of strategic choices in terms of areas such as education, recruitment and development of strong research environments. In addition, several HEIs should be able to engage directly in the development of ESS and Max IV in terms of instruments, analysis methods, sample management, etc. One strategic question for Sweden is whether it wishes to be part of the initial instrument development, which if so would require an immediate financial input, where the skills that exist in the country are given direct support to enable them to be active partners in the already ongoing development projects. Primary responsibility lies with Sweden's HEIs, but targeted support from the Government would ease the process.

Both HEIs and funding bodies are responsible for acting in the long-term interests, so that major investments, such as the Swedish Foundation for Strategic Research's investment in a research school for neutron scattering and Nordforsk's neutron programme, have the desired effect. Main responsibility again rests with the HEIs, but research funding bodies and other actors are also responsible for supporting this development through dialogue and tools in the form of strategies and incentives, various forms of financial support and communication efforts.

ESS and Max IV have the potential to become important tools for several sectors of industry of relevance to Sweden. For this group of users, there may be a need for special conditions for sample handling, user support, quick access and support in all parts of the experimental process (formulation of experiment, implementation, analysis and synthesis of results, etc.), which should be developed in conjunction with the facilities. Several of these needs are shared with other categories that need user support, but there may be other marginal conditions to take into account for the business sector, such as a need in some cases to keep results confidential.

As most of the use of infrastructure for research and development by the business sectors is conducted through collaboration with academia, the importance of good relations between actors from academia and the business sector cannot be sufficiently underlined. This collaboration should be developed, particularly within the framework for competency centres or other similar long-term programmes at each HEI. Here, HEIs' ESS strategies should be based on their own functioning collaboration models with the business sector, research institutes and the public sector, and also campus-based science parks and innovation offices. Good examples of this type of support can also be gathered from instances such as Denmark's scientific "portals" for industry¹.

2.1 Sweden shall support research using neutron scattering for the purpose of reinforcing Sweden's opportunities to contribute to the long-term development of ESS and the use of complementary technologies.

2.1.1 Swedish participation in the development, construction and use of instruments at ESS shall be safeguarded. In this work, collaboration between actors, primarily participation from Swedish HEIs, shall be promoted.

2.1.2 Collaboration shall take into account opportunities to conduct experiments using instruments at both ESS and Max IV.

2.1.3 Adapted user support shall be developed for users from academia and industry, in particular with focus on translating industrial challenges into implementable tests that provide documentation for tomorrow's innovations. The support can be provided both via the facilities and via national actors from HEIs or consultancy-oriented knowledge companies that act as intermediates.

2.2 Researchers based in Sweden shall be early users of instruments at ESS.

2.2.1 Access to the neutron sources that are leading today – and up until ESS is fully developed – shall be safeguarded to ensure Swedish researchers are competitive and experienced users when ESS comes into operation.

¹ See for example <http://innovationsfonden.dk/da/case/historisk-mulighed-gribes-dansk-industriell-vaerdiskabelse-gennem-verdens-mest-kraftfulde>

2.2.2 In the medium to long term, competitive researcher groups who use or can use neutron scattering shall be supported. This applies both to expert users and other users.

2.3 The Swedish user base for ESS shall be expanded and widened.

2.3.1 In the short to medium term, the user base shall be expanded, for example through strategic recruitment to Swedish HEIs of researchers within relevant areas; both established researchers and those who can be expected to be at the peaks of their careers when ESS comes into operation. The research schools that are now starting can be seen as an early and first step in this direction.

2.3.2 Information efforts shall be aimed at the areas that do not currently have any regular neutron users – but where the potential is great – in order to show representatives from these areas the opportunities offered by ESS.

2.3.3 Facilitate access to experiment time for users other than from academia through promoting the innovation potential of the project, as well as its scientific quality, being weighted into decisions in conjunction with evaluation of applications.

2.3.4 Gender equality shall be promoted among researchers using ESS and in governing and advisory bodies related to the facility.

2.3.5 Opportunities to deepen first-cycle education through theoretical and practical units at ESS and Max IV shall be utilised by Swedish HEIs.

2.3.6 Institutional collaboration shall be built up nationally within relevant areas of strength in order to establish platforms within new user areas that can increase interaction with and stimulate business sector participation through collaboration with researcher groups at the HEIs.

2.3.7 Strategies for Swedish involvement in facilities for neutron scattering and, as relevant, other scattering techniques shall be coordinated to achieve synergies and resource-efficiency.

2.4 Sweden shall strive to use the opportunities offered by handling data generated by ESS, for example through Swedish researchers participating in the development of the ESS data centre in Denmark. Collaboration shall also take place with Swedish organisations such as Snic and Sunet, which will then need increased resources to meet the new needs.

2.5 In an international context, Sweden shall support research and development using neutron scattering, for example in programme committees within the EU and in discussions with other states, and thereby safeguard the long-term operation and development of ESS.

2.5.1 Collaboration between relevant actors shall be promoted for the purpose of working towards operational investments that provide long-term financing of ESS, in particular as concerns Swedish participation in the development of future instruments.

2.5.2 Sweden shall collaborate with the other Nordic countries, currently primarily Denmark and Norway, to broaden the user base and to contribute to competency development within neutron scattering.

2.5.3 Existing bilateral agreements and collaborations with countries such as France, United Kingdom and Germany (the facilities ILL and ISIS, and research collaboration within the Röntgen-Ångström cluster, RÅC) shall be developed to safeguard increased exchange and to ensuring they contribute to competency development towards ESS and synergies with other technologies.

2.5.4 Sweden shall work towards areas and themes that are relevant for ESS and Max IV are included as far as possible in upcoming calls within EU programmes and ensure that the stakeholders involved are aware of these opportunities.

2.6 Continue building on good collaborations and integrate development and use of ESS in functioning working formats between business sector actors and researcher groups at Swedish HEIs. This applies particularly to utilising spin-off effects within the innovation systems of all participating HEIs.

2.7 Use of ESS within academia and the business sector shall be followed up regularly.

3. Sweden shall create a globally attractive knowledge and innovation environment, with ESS and Max IV as the corner stones.

ESS and Max IV are each unique facilities for research and development, which will attract prominent researchers to Sweden. The fact that they are being constructed in close proximity to each other will further strengthen the potential to establish an internationally leading competency cluster. In this development work, and as the use of Max IV and ESS increases, a large number of actors will be active at the facilities or in their proximity. Persons ranging from Masters students and researchers to entrepreneurs and employees in the business sector can contribute to the knowledge environment, which acts as a national gateway to the international knowledge base within the area. One model is a facilitating science park that has the mandate, on a non-profitmaking basis, to:

- Safeguard the development of the physical environment by offering an attractive collaboration and support environment for actors from academia, the business sector and society in constant development.
- Strengthen the link to the users' geographic location and the collaboration that develops there between academia, the business sector and society.
- Offer a location for advanced service functions to support the actors' development, for example through an Industrial Liaison Office (ILO) for business contacts.
- Support the initiation of activities among the actors in the knowledge environment, who then become responsible for the continued operation and development of these activities.
- Support Sweden's sustainability goals within Agenda 2030.

The development of the model for a facilitating science park should be done in collaboration with the bodies responsible for development in the regions that are active today, while being open to changes over time. This collaboration should be designed in such a way that it supports the meeting between the business sector, academia and public actors in each region. The national actor then develops natural support functions at relevant science parks across the country.

The crucial drivers to visit or establish oneself in the knowledge and innovation environment surrounding ESS and Max IV are the high-class research facilities and the stimulating scientific environment. At the same time, functions such as housing, restaurants, social meeting places and transport are central, and need to be both fit for purpose and attractive. For researchers and personnel associated with ESS and Max IV over a longer period, it is not just the immediate surroundings that have the power to attract, but also functions further away, and general conditions in the country. In order for the highly skilled persons and their relatives who are considering relocating to Sweden, or who are already here, to choose to stay here, areas such as migration, tax and labour market policies need to be reviewed. The potential of the environment surrounding ESS and Max IV lies in creating the right prerequisites, a critical mass and the right actors to achieve the goals. ESS and Max IV should be seen as a testing ground for developing Sweden's chances of offering an internationally attractive knowledge and innovation environment.

Considering that researchers and business sector actors who wish to use Max IV are already in the starting blocks ahead of the opening of the facility in summer 2016, the most fundamental functions must be established more-or-less immediately – with the overall picture and the long-term use in mind.

3.1 Sweden shall create an attractive and functional knowledge and innovation environment in conjunction with ESS and Max IV. The completion of the facilities and the detailed planning of the area between them shall be the starting point for promoting such an environment. Agreements that define the development of the area and the responsibilities and influence of various parties should be drawn up during 2016 between the facilitator (see below), regional actors and others.

3.2 A national, non-profitmaking facilitator should be established as soon as possible, for example according to the model for a national science park (see above), who together with the actors involved can develop the area adjacent to ESS and Max IV into a knowledge environment with global attraction. The commitment at national level may be effected through interested HEIs plus private and public actors forming a partnership with the task of developing the knowledge and innovation environment. The profits created can be returned to the operation, and benefit research and innovation. The opportunities for part-financing from the EU should be reviewed.

3.3 Policies, laws and regulations should be reviewed to facilitate mobility and recruitment of the necessary competency and the establishment/development of companies. In this way, the highly skilled persons and their relatives who are considering relocating to Sweden because of the new facilities can choose to stay and work in the country.

3.4 Max IV should be used as a launch pad. When the facility becomes operational in summer 2016, new user groups from academia and the business sector will come to the area. They have the opportunity to take part in experiments at an advanced research facility, which might create an incentive for them to then participate in the development of ESS and to try new technologies.

3.5 The need to develop complementary laboratories and opportunities for newly formed spin-off companies close to the facilities shall be taken into account when planning the area, as well as existing service and technology companies. In the first instance, the users' scientific needs shall be the driver for these, but the innovation potential shall also be weighed into the equation.

3.6 The area shall function as a "shop window" displaying Swedish leading edge technology and competency to a national and international audience.

3.7 Opportunities for European financing and opportunities for coordination of national/international funding bodies and other stakeholders shall be utilised.

4. The Swedish business sector and academia shall act as suppliers to ESS, and thereby benefit from the technology and competency development this entails.

Sweden shall support the business sector to benefit from the development and operation of the facilities and use knowledge development to meet global change and competition. Innovation takes place on a large scale also in the industrial companies who are part of the development and use of the facilities. The area around ESS and Max IV will become a competency cluster, where the Swedish business sector gains access to the greatest talents, and where mobility between and within academia and industry is facilitated.

Companies of relevance to Sweden should improve their participation in the procurement to deliver finished materials or components to the infrastructures. They shall also reinforce their ability to compete with leading edge competency, technical developments and innovative solutions. The environment around the complex infrastructures now being constructed will constitute a knowledge hub, where various forms of support measures will give great potential to strengthen the ability of Swedish companies to change and become competitive in the long term.

4.1 Swedish business actors shall be collaborating partners in the development of both ESS and its surrounding functions. Swedish companies can also benefit from the new innovations to which the collaboration and development at the facilities will give rise. International attraction and a global research position offer opportunities to develop activities for both research and innovation in surrounding areas. The Swedish involvement in ESS shall contribute to increasing private investment in research.

4.2 The strength of collaboration between academia and industry shall be reinforced and developed. The working formats and collaboration that is already working can be used and developed into also include tests at the facilities and delivery of advanced equipment.

4.3 A prerequisite for ESS, Max IV and similar facilities in the international front line is that each country has an organisation for industry collaboration that functions as a link between each country's potential suppliers and the facility. This function, which will provide support to the facility in the form of contacts with relevant actors and use information to mobilise the country's actors to participate as suppliers during the development and operation of the facilities, needs to be reinforced in Sweden. The reinforcement should start from existing structures and make opportunities visible via the proposed facilitator.

4.5 Ensure that there is a professional organisation at ESS to handle business sector contacts. This organisation shall collaborate with the local management of these issues by the HEIs.

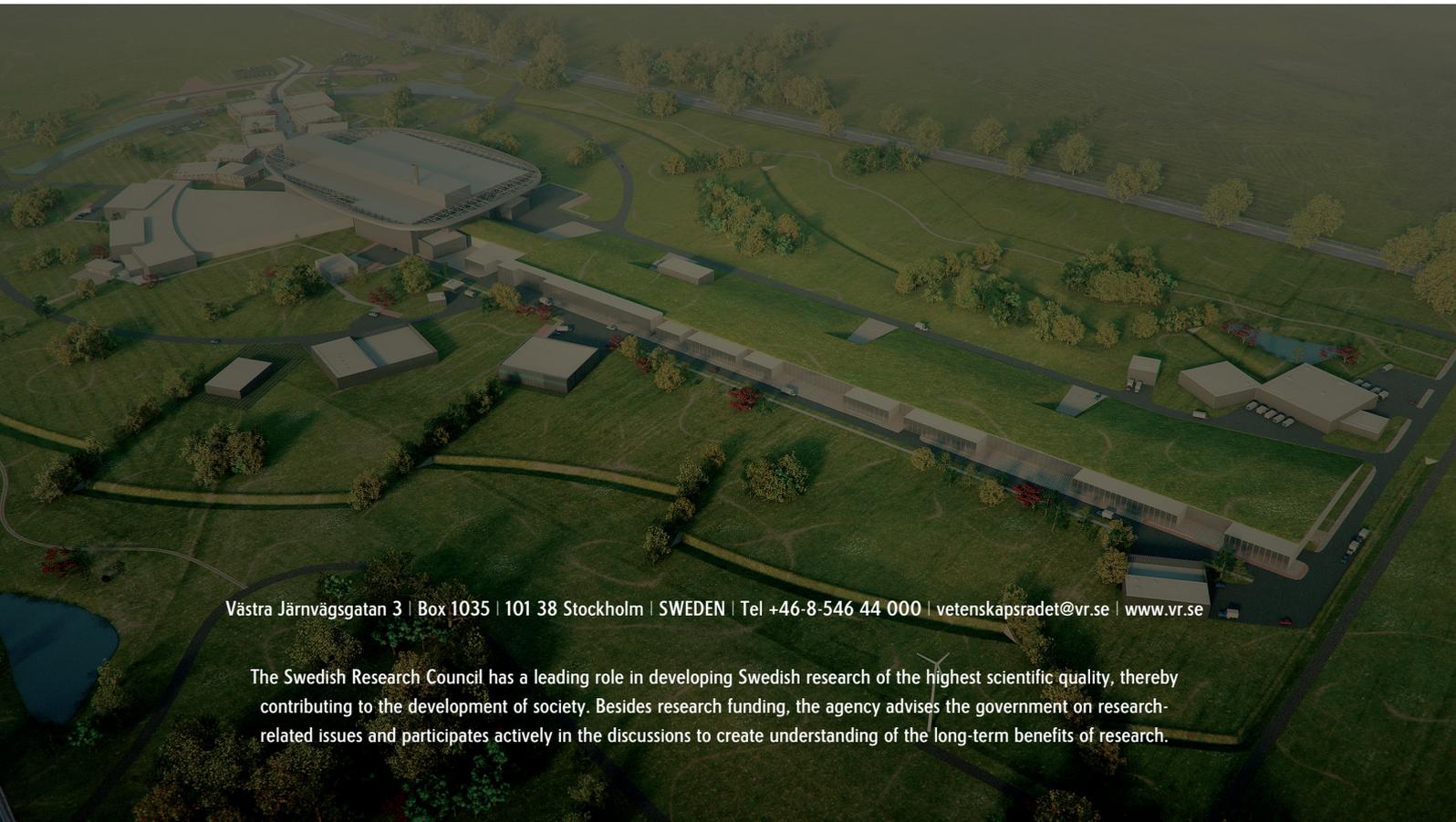
RESERVATION

In accordance with the government mandate, this strategy is limited to the ESS facility, including the consequences for Sweden as host country and closely related activities such as research at universities and synergies with Max IV. Additional strategies for the use of other techniques for examining materials would be welcome. Regional or sectoral strategies may also be appropriate complements to this strategy.

Since the ESS is not ready to be taken into more extensive operations until around 2025, the strategy has a higher level of detail early in the period leading up to the start of operations.

Vision and strategies cover the entire 15-year period until ESS is in full operation in 2030, while sub-strategies and sub-goals are more flexible.

ESS (European Spallation Source) is a multi-disciplinary research facility built outside Lund. At ESS it will be possible to study all types of materials, including cells and molecules, using neutron beams. This proposal for a strategy to stimulate Swedish participation, use and skills supply for the construction and operation of the ESS extends until 2030.



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The Swedish Research Council has a leading role in developing Swedish research of the highest scientific quality, thereby contributing to the development of society. Besides research funding, the agency advises the government on research-related issues and participates actively in the discussions to create understanding of the long-term benefits of research.