



Research Strategy 2021 – 2026



Research Strategy

2021 – 2026

SUMMARY

The Swedish Foundation for Strategic Research (SSF) is an independent organisation with the objective to fund research within technology, medicine, and natural science with the aim of strengthening Sweden's long-term competitiveness. The research must be at the forefront internationally and relevant for meeting the challenges of industry and society. SSF organises its funding into programmes, typically prioritising areas of research and with the agility to create new types of grants. Focus is placed on cross-discipline collaboration and the mobility of researchers between industry, academia and society, as well as internationally. Efforts are directed towards postgraduate training, career support, enabling technologies, new scientific methods, use of research infrastructure, and the utilisation of research findings. In addition,

SSF exerts its influence by stimulating innovation, quality, and collaboration. In dialogue with stakeholders, it aims to find leverage opportunities for efforts. The research must fulfil the dual criteria of scientific quality and societal relevance. SSF's support is typically aimed at time-limited projects, where the objective is to act as a catalyst for the long-term development of participants. Entrepreneurial researchers are given the freedom to formulate research questions, put together research teams, and choose methods.

The overall goal of this strategy is to elevate Sweden in times of intensified international competition. Especially the global challenges of sustainable development require more strategic research. Sustainability is a prerequisite for success and is a competitive advantage within product development. Furthermore, SSF wants

to bridge the gap in the funding landscape between basic and needs-motivated research. Since there is no obvious funding for strategic research from the Swedish government, SSF is even more important. Its historic success is directly linked to the independence of SSF and its long and loose time frames. One change within this strategy is that SSF has decided to no longer have an end date for its operation. Therefore, its spending will have to be reduced for a few

years. On the plus side, this will bring increased financial stability, better predictability for future spending and, over time, increased grants for Swedish research. SSF's research portfolio is being renewed through the launch of multidisciplinary research areas, linked to societal challenges. In addition, career and mobility support will be refined. SSF is stepping up efforts to help Swedish research groups become involved in the research programme Horizon Europe.

ABOUT THE FOUNDATION

SSF is an independent non-profit research foundation. SSF acts independently when funding Swedish research. The purpose, as laid down in the statute (§1), is to:

- **support research within natural science, engineering, and medicine**
- **promote the development of strong research environments of the highest international standard and of significance for the development of Sweden's long-term competitiveness.**

Recipients eligible for support from the Foundation are typically active within Swedish universities (both new and old), research institutes, regional hospitals or companies.

The activity clause states that efforts can be directed towards both basic and applied research, and, not least, areas between the two. However, the research should always be strategically relevant for Sweden. Typically, this involves:

- **a concentration of efforts in order for internationally competitive research centres or research areas to be established**
- **interdisciplinary projects and programmes**
- **the establishment of cooperation networks or firmer forms of collaboration nationally and internationally, for example by the establishment of an international exchange programme for researchers**
- **promotion of postgraduate studies and recruitment of researchers**
- **the establishment of research centres or research specialties in close affiliation with universities and colleges**
- **collaboration between academia and industry in areas of particular interest to industry**

- **the promotion of mobility of researchers internationally and between universities, institutes and companies.**

In order to fulfil its purpose, SSF appreciates that research disciplines other than those within science, technology and medicine are linked to the projects, and funded by others such as, for instance, the relevant university. This can strengthen the relevance and impact of the research.

In choosing to fund **programmes**, SSF is making targeted calls for research grants to researchers and projects, selected following expert evaluation of applications. Advisory committees include expertise from academia, industry and society, including international evaluators and sometimes interview groups. From time to time, we review the different programmes and respective projects as well as the procedures for calls and advisory committees.

SSF's support for research generates scientific results and research expertise that enable progress within academia, industry, medical and health care, and government agencies. Contact between researchers and users in industry and society is seen as a particularly important success factor.

SSF selects recipients of research grants according to two main criteria, both of which must be met:

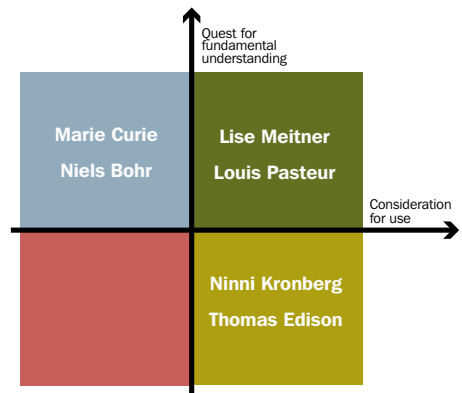
- **Excellence**
- **Strategic relevance.**

Excellence refers to the scientific quality. The concept of *strategic relevance* is aimed at

addressing *important* problems and opportunities (where success will benefit many people), solvable problems, neglected problems or untapped opportunities. For each case, the potential benefit, application or commercialisation is set out.

Progress within disciplines is desirable, but not sufficient to meet the requirement for relevance. Project applications shall state which societal needs will be addressed, what opportunities are created, and how the results will be utilised. SSF makes special funding available for this. Today, sustainability permeates the strategic relevance of all projects.

SSF uses Pasteur and Meitner's Quadrant¹ where the researchers were driven both by a desire to understand phenomena scientifically (arrow pointing upwards) and to create applications (arrow pointing right).



ECONOMIC CONDITIONS

SSF's capital is made up of funds set aside when the Foundation was set up in 1994, as well as the interest gained and possible future recapitalisation. At the start of 2021, SSF had spent nearly SEK 16 billion on research grants through careful management of the original

1. Donald Stokes' Pasteur's Quadrant, Brookings Inst. Press, Washington, DC (1997) supplemented, Lars Hultman (2017)

capital worth SEK 6 billion. At the same time, SSF had a remaining capital of more than SEK 11 billion.

In 2020, SSF decided to enhance its financial stability in order to achieve overall increased spending well into the future, and to achieve better predictability of future grants. In this current strategy plan, the annual framework for research grants for new initiatives is set to SEK 300 million. This is intended to create stability by maintaining a capital base that can offset fluctuating capital returns in the future. However, due to decisions made in previous years, the average instalments will remain at a much higher level during the period 2021 – 2026. For the subsequent strategy period, SSF is expected to be able to offer annual grants worth SEK 400 million, and then to reach a permanent annual level of SEK 500 million.

This *insurance model* provides better prerequisites for return on capital and guarantees the Foundation's long-term viability and efficacy. The assessment is that also in the future Sweden will rely on the independent Foundation for funding of strategic research within its remit, where success is directly linked to its independence and the long and loose timeframes.

Donations and a recapitalisation from the government would increase the proportion of strategic research in Sweden, which is low on an international scale. The importance of strategic research for national development and sovereignty is reflected in the way the EU, the US and China are acting. As Swedish research represents only one percent of research globally, we need to prioritise excellence and international attractiveness in our research. A report by the Royal Swedish Academy of

Sciences and the Royal Swedish Academy of Engineering² points to the need for Swedish funding for strategic research, operating at arm's length from the government, and targeting needs-driven research with a longterm perspective focused on applications for industry and society.

THE VALUE OF EXTERNAL RESEARCH FUNDING

External research funding, i.e., in addition to an institution's own resources, has several positive effects:

- **promotes quality in research through open and transparent competition**
- **initiates inter-, multi-, and transdisciplinary research with collaboration between different universities and actors in society**
- **introduces new research areas and strategic programmes.**

As an independent, non-governmental organisation, SSF has an outstanding degree of freedom to meet the above points. Optimal implementation of research initiatives requires prioritisation from participating universities, research institutes or industry. This may involve harmonisation of the parties' operational strategies and researchers leading projects being provided with what they require. Merit systems may need to be strengthened in terms of collaboration and utilisation. The Foundation does not normally request co-financing (*in kind*) from participating industries, but commitments are appreciated. Based on the

2. SSF – Att vara eller icke vara? Lars Calmfors (the Chair's evaluation group) 2014

above circumstances, the university concept of "full recovery of costs" for projects (also known as the OH model) does not seem justified for externally funded research projects.

ACTING STRATEGICALLY

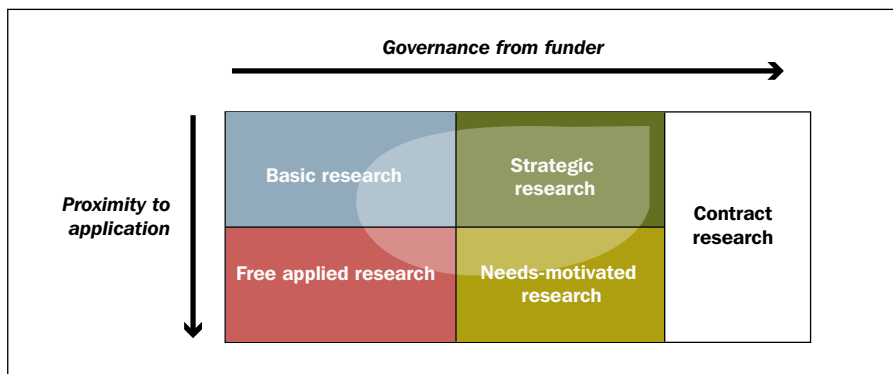
Society is undergoing formidable transformations. The need for discovery and innovation is increasing, whilst existing knowledge and proven experiences need utilising. Research and innovation create opportunities for solving various societal challenges. Hence, this requires basic research targeted at such problems in parallel with users being able to utilise scientific achievements. The figure below shows SSF's position in the research system:

administrative burden is minimised to annual reports and a midterm evaluation.

Circumstances in Sweden mean that there is no government-run funding organisation explicitly for strategic research. Hence, SSF plays a crucial role in bridging the funding gap between basic research and research driven by innovation and need.

Internationally, there is a clear trend towards more strategic research and effective supporting instruments. The intention is to speed up discoveries that can be applied within high-tech industry and essential societal infrastructure.

SSF creates progressive forms of research support. This is not intended to supplement funding from other organisations or as a sub-



In terms of the area for respective funding call, SSF operates according to a top-down perspective based on comprehensive problem descriptions and user interests. The perspective is then altered so that in their application the researchers themselves choose their approach and implementation. Then, selected projects are given the greatest possible freedom in how the funding is used, whilst the

stitute for government support. SSF's strategy is to reward research that will contribute to increases in productivity and competitiveness within the foreseeable future, whilst also encouraging research breakthroughs. This requires commitment and perseverance from researchers, and efficiency at the system level.

The bottom line is that SSF primarily targets entrepreneurial researchers, giving them great



freedom to define their research, to put teams together, and to choose methods whilst being responsible for achieving results and for communicating these to the wider society. The focus is therefore on generating useful results rather than working according to a stipulated format.

WHAT IS STRATEGIC RESEARCH?

The interpretation of the two key concepts of **strategic research** and **Sweden's long-term competitiveness** determines how SSF carries out its mission.

Strategic research is defined by SSF as:

Targeted application-inspired basic research.

Strategic research forms a bridge between basic research (where the future is not defined) and product development through applied research (where the future means short-term). SSF is encouraging the utilisation of high-quality research with great potential for results

being used. This can be achieved through an inter-/multidisciplinary approach being applied in projects, and with calculated risk-taking in research planning.

Strategic research is based on research that meets the long-term societal need for applied knowledge, i.e., research of the highest quality that is relevant and has a good chance of having an impact in the long term. At the same time, SSF is content supporting researchers working their way up the value chain towards new products and services. The benefits are assessed from, among other things, the following tangential aspects:

- **internationally brilliant, complete academic environments that integrate knowledge and innovation through interconnected training, research, and collaboration**

- **enabling technologies for sustainable development**
- **synergies between private and public research funding where the utilisation becomes effective**
- **research with results that form the basis for development of existing or new businesses, including by the researchers themselves**
- **research graduates, who through broad post-graduate training and generic abilities become attractive for employment within industry and society**
- **research as a focal point for international cooperation, leading to investments made in Sweden**
- **new medical treatment methods against disease, and health interventions.**

SSF's definition of *long-term competitiveness* is based on the impact research results have on society, outside of academia, in 5 to 15 years' time. SSF operates, correspondingly, at the intersection of basic research and areas of application potential.

The competitiveness is evaluated based on how well Swedish research and postgraduate training score in an international comparison, and how these contribute to industry increasing their market shares or lead to a more efficient society. SSF's research strategy shall contribute to the advancement of the country's position in the world, and to the expansion of our researchers' contribution to

global innovation and knowledge. At a time when competition for skills and talent is increasing worldwide, Sweden should be a country where it is attractive to seek higher education and livelihood.

STRATEGIC INSTRUMENTS

The Foundation's choice of research areas and types of grants are essential instruments, as are the researchers contributing their expertise in interdisciplinary and multidisciplinary collaborations in order to attain a critical mass of knowledge. Examples from SSF's previous initiatives are framework grants within thematic areas such as digitalisation, life sciences technologies, and advanced materials development, which have led to a significant reinforcement of Swedish research. For individuals, it is about rewarding mobility and leadership among young researchers as well as creating career opportunities for key people working in research infrastructure. Thus, it concerns training, recruiting, and retaining excellent researchers.

The research environment's driving force and alertness to relevant problems are often crucial for success, as are the stakeholders' competence to procure research and subsequent capacity for adsorbing results at the collaborating clinic or company.

In addition to **the main criteria scientific quality and strategic relevance**, SSF applies several strategic perspectives when selecting research projects, depending on the call:

- **Multi- and/or interdisciplinarity**
- **Internationalisation**
- **Mobility between sectors**
- **Management of IP rights**

- **Leadership**
- **Sustainability.**

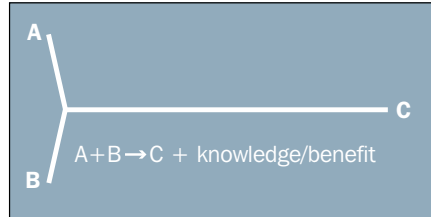
An inclusive leadership of respective project is a key success factor. Gender equality and equal opportunity among applicants are other factors. SSF has the same average grant acceptance rate for women as for men.

The Foundation aims to ensure that all research grants are more than sufficient for projects to achieve what is expected of them.

INTER- AND MULTIDISCIPLINARITY

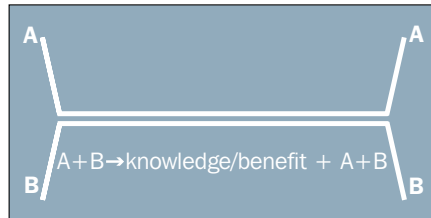
As discussed above, SSF encourages new forms of collaboration between research environments. Here, inter- and multidisciplinary approaches are important elements used interchangeably as goals and means within the strategy. This is because SSF seeks to promote Sweden's future competitiveness, the challenges and solutions of which cannot be expected to adhere to academic scientific disciplines. The context of each call or how researchers can best find it will determine what discipline it falls under. Mixed forms of inter- and multidisciplinary are equally attractive.

Calls are encouraging change; they are aimed at bringing forward new disciplines and transformation in the way research is conducted, and to provide combined force. There is some language and conceptual confusion in society about inter- and multidisciplinary studies. As, together and individually, they are important factors for strategic research, SSF formulates the definitions it uses and specifies how these fit into its operations:



Interdisciplinarity is a research activity involving knowledge, methods, and expertise from different scientific disciplines. Researchers meet in the border area between subjects (A, B) and can create new disciplines (C): Examples from classic SSF programmes are interdisciplinary framework grants and thematic graduate schools.

Multidisciplinarity also involves several scientific disciplines. Activities are collaborations and interactions between different fields of knowledge around a common problem, but the researchers remain within their respective fields and continue to build expertise within their discipline:



Notable here are SSF's focus on sustainable development at its *Advanced Research Centres (ARC)* as well as its upcoming *Multidisciplinary Research Centres (MRC)*. Such collaboration can be temporary, but may also become permanent. Framework grants also include elements of multidisciplinary.

The utilisation process can be linked to **translational research**, as scientific know-

ledge is transferred from the lab environment to applications, clinics or other users. Trans-disciplinary research takes place when concepts, methods and *know-how* from several disciplines merge through active collaboration between researchers and parties outside academia. The term is sometimes used as synonymous with interdisciplinary studies, but then in a broader – organisational – meaning, for a desired lasting change, for example, through continued collaboration outside academia. In some calls, SSF encourages the fusion or convergence of research within parts of medicine, science and technology. For increased cross-fertilisation, further research disciplines other than those central to SSF's scientific areas, will become relevant in future calls, then with additional funding from other organisations, such as the universities themselves.

THE FOUNDATION'S MOMENTUM

Since its inception in 1994, SSF has played a system-transforming role in Swedish research.^{3, 4, 5, 6-7, 8} We aspire to break institutional lock-in and counteract institutional capture. SSF creates new forms of collaboration between higher education and users. During various periods, SSF has provided funding for innovative graduate schools, strategic centres, and interdisciplinary framework grants within emerging research fields. The graph on the next page shows these periods and an upcoming period of multidisciplinary focus with initiatives for mobility.

In thematic areas, SSF has promoted research on information, communication and systems technology (ICST), life sciences, and bioengineering as well as advanced materials and technologies, not least nanotechnology.

Scientific publications from SSF hold the top spot for citation rate compared with research funded by the government's research councils and basic research funding.⁹ This supports the idea that research based on criteria for relevance can be combined with, or leads to, high scientific quality.

In 2021, more than 300 projects are underway with funding from SSF, and since the start in 1994, more than 1,800 projects have been made possible. The projects are assisted by research secretaries and programme committees, for example in order to support conferences, investigations/reports and research communication as well as for utilisation and international links.

FUTURE FOCUS

SSF has decided to extend its activities well beyond the previously applied 15-year horizon. The economic conditions for consideration of this are presented on page 4 and will represent a broadly halved financial framework for research during the next five years. The aim is to strengthen the Foundation's financial stability in order to achieve overall increased funds and better predictability of future grants.

For this reason, as well as in order to face accelerating international competition, SSF will in future prioritise its role as a catalyst for Swedish research, driven by initiatives and results aimed at creating added value. We all want to enable more research and achieve more benefits per invested Swedish krona. The assessment is that this is possible for a marginal player like SSF, that in 2021 represents just under two percent of the government's total spending volume. SSF will need to

3. I den absoluta frontlinjen, Sverker Sörlin 2005

4. Faugert Effektstudie 2014

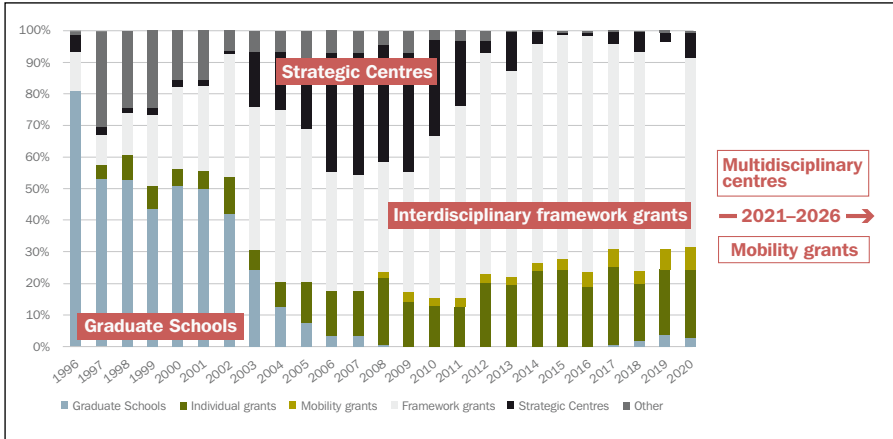
5. Tillväxtnalys 2015

6. The [IRC] Centres of Attention, Damvad 2017

7. Stiftelsema ett kvartsekel, Klas Eklund 2019

8. Analysis of Intersectorial Mobility, Technopolis 2019

9. Vetenskapsrådet: Rapport Dnr 351-2014-7356



Instalments per grant type since start.

sharpen its tools in order to support creativity and innovation within research, postgraduate training, and collaboration. Initiatives will be directed towards entrepreneurial researchers in strategic areas and research environments. Also on the agenda are focal points in research together with effective preparation of calls and applications.

In future calls, SSF will stimulate multidisciplinary efforts. The calls are supposed to encourage project proposals that are excellent or – even better - 'outstanding'. Another important factor is that the research should be able to result in indepth knowledge and competence that can be *applicable* in knowledge-intensive and high-tech industry or society sectors in Sweden.

Ideally, results from projects supported by SSF should be utilised. This enables the desired validation of research results in important environments.

The ten levels of the *Technology Readiness Level* (TRL) scale, developed by NASA in the 1970s¹⁰, is used for many of SSF's research

areas. Here, SSF places its activities at the lower levels 1-6, with emphasis on 2-5, so that they range from the formulation of technology concepts and applications in connection with a discovery/innovation to the realisation and verification of these in relevant systems. We are stimulating research within areas that may not have collaborated previously. These new links are made with the aim of achieving synergies across boundaries, i.e., benefits at the margins of disciplines that may enable new solutions. The wide TRL range corresponds naturally to linked professions and disciplines, expanding the project framework towards inter- and multidisciplinary.

The timeframe for individual efforts normally includes a grant period of 3–6 years. This is to enable activities to fit into the long-term plan within the educational institution in question, or to bring to competitiveness new fields that are then further developed at universities and research institutes or by industry and implemented in the rest of society.

10. Mihaly, Heder (September 2017). «From NASA to EU: the evolution of the TRL scale in Public Sector Innovation». *The Innovation Journal*. **22**: 1–23.

TYPES OF GRANTS

The current strategy covers SSF's activities over a period of five years. Decisions on calls are made in line with internal preparation supported by experts. The types of grants chosen will be reviewed annually based on their ability to promote the greatest possible strategic impact at the time.

SSF uses a dynamic grant structure based on tactically strategic considerations. Common to SSF's research support is that boldness of innovation and risk-taking in projects are rewarded, and that links between needs and actors within industry and health and medical care are established already during the phase when problems are being formulated. Equally important for the implementation of the research is an active and structured acceleration of the utilisation of research results (see final section).

At the start of this strategy period, SSF's research portfolio includes the following types of grants. These may be modified, new ones added, and programmes ended once their purpose have been fulfilled:

- **Centres**
- **Career**
- **Mobility**
- **Ad hoc efforts.**

The main change from previous periods of SSF activity is the introduction of multidisciplinary research centres (MRCs) and the pause in interdisciplinary framework grants. This results in the number of research areas being preserved, but with fewer and larger projects within them.

MRCs are defined based on major societal challenges, whilst framework grants were

intended to initiate new research areas, or support neglected areas, which SSF has delivered.

CENTRES

Multidisciplinary Research Centres

Here, SSF introduces the grant type *Multidisciplinary Research Centres (MRCs)*. An MRC includes coordinated research where different scientific competences work together to solve actual challenges, where there is a clear scientific question based on gaps in knowledge and plans for the implementation of research in industry and society. The perspective used is research motivated by needs, where innovation and efforts on a broad front help to solve an explicitly formulated mission (cf. *EU mission*). MRCs will also enable mixed forms of multidisciplinary, preferably with elements of interdisciplinarity.

SSF identifies areas for MRCs according to its own mapping and suggestions based on research needs corresponding to a significant challenge. An MRC is built around a group of researchers in Sweden who are world-leaders within the targeted area. Calls are then made, and viable programme proposals are selected for each area, taking into account the marginal benefit of SSF's funding.

Participating researchers join in from different faculties/universities where each of them is a leader in their field. The main applicant is also the leader of the centre. Given the scale of the activities, it makes sense to employ a deputy centre leader, as well as coordinators of administration, postgraduate training, and collaboration/utilisation. Naturally, stakeholders and competent individuals from industry and society are invited to join the boards of cen-



Karin Markides, Zhen Zhang, Marija Cvijovic, and Anna Martinelli with FFL-6:s delegation on study trip to Tokyo.

tres. Research issues as well as the regulation of intellectual property rights within an MRC are agreed between the parties involved, including industry participants. SSF wishes to see active stakeholder participation and seeks leverage from complementary funding, with the MRC at its core.

Because an MRC pulls efforts together to solve a clearly defined task and is expected to act dynamically, it is natural for the participating researchers to move on to other challenges once the project period has ended. The researchers' generic abilities developed during the project, together with knowledge gained within disciplines and insight into applications will then become an additional strategic resource for Sweden. Hence, at least within universities and already during the application phase, contingency, decommissioning and transitional planning should exist for an MRC, preferably anchored with the respective leader. As already stated, SSF is not a permanent sponsor.

CAREER

Future Research Leaders (FFL)

The FFL programme refers to a tenure track towards professorship for young researchers (career age; four to seven years following a PhD degree) showing potential for a leadership role, and intends to give these the opportunity to set up ground-breaking and internationally recognised research groups. With eight generations so far, FFL is a pioneering programme in Sweden and continues to be developed, not least for extensive leadership training. The programme contributes to the creation of a complete academic environment, i.e., one that includes research, training and collaboration. Afterwards, the researchers are expected to be able to take on organisational responsibilities also outside academia. Calls for FFL are planned to continue every three years.

Research Infrastructure Fellows

The programme is aimed at individuals with unique skills, interested in a career as *beam-line scientists* or research engineers at a research infrastructure affiliated to Sweden. Applicants should have worked for between two and ten years following their PhD degree. The aim is to develop scientific methods, instruments, labs, data bases/registers, etc, and to make these available for wider use, including by players outside academia. A prerequisite for the grant is that the universities concerned themselves prioritise the infrastructure in question and can administrate these positions within their employment systems.

Development of Instruments, Techniques, and Methods

To continue moving forward, the research front requires new techniques and ever more advanced instruments. Despite this, incentives for such development work are often lacking in academia. Therefore, SSF regards it as an urgent and strategic task to support the careers of inventive individuals within this area. The programme includes individuals active at universities or institutes, who build scientific instruments or develop new techniques or methods. The target group is research engineers wishing to focus on development or verification work. Faculty employees with up to ten years' experience following a PhD degree may also be considered, but then only if the development of instruments, techniques or methods is their main activity and they are involved in the practical work rather than supervising others to carry out projects.

MOBILITY

SSF has always encouraged the mobility of researchers. We have built one of Sweden's most colourful palettes of programmes that stimulate mobility. This strategy will be continued in this strategic plan through the development of various offerings to academia, industry, research institutes, healthcare, and authorities. This will be especially important as we exit the Covid-19 pandemic, which has prevented exchanges and hampered creative processes.

Strategic Mobility

A qualified person from a university (alternatively a research institute) or company (alternatively an authority or hospital) can apply for funding of salary to carry out a strategic research project within a sector other than the one in which they are currently working. Hence, exchanges can be bidirectional. Calls are usually made annually.

Industry and Institute PhD Students

SSF is concerned about the situation in Sweden, where the number of PhD graduates is stagnating and many of those newly graduated with a PhD degree choose to leave the country. As research skills are an increasingly important strategic factor, SSF is directing support towards the skills development of young people within industry, clinics, authorities, and research institutes. This is done through the programmes Industry PhD Student (ID) and Research Institute PhD Student (FID). Applicants must be employed by an organisation separate from the university or research institute where they have been admitted as PhD students, and must spend equal time within

both organisations. The plan is to make calls annually (ID) and biannually (FID).

Adjunct Professor/Lecturer

In Sweden, much research competence can be found within industry, authorities, and the healthcare sector. It is estimated that about two thirds of Swedish research and development are carried out outside academia. These industry researchers can develop into builders of bridges between academia and its societal surroundings for exchanges of research challenges and knowledge. The programme enables six years of 20-50 percent employment as an adjunct professor or lecturer at a Swedish university. Hence, the researcher must spend at least one day a week at the university.

SSF Sabbaticals

The programme is aimed at lecturers and professors at Swedish universities. It enables a oneyear sabbatical for work at a foreign research organisation within a different field than the one in which the applicant is currently active. The purpose is to encourage mobility within the university system and to help solve significant research challenges through inter-/ multidisciplinary. Equally important is the promotion of cross-fertilisation and an international perspective on research in Sweden. Grants cover the cost of 6-18 months' stay abroad at organisations such as universities, industries, hospitals, research infrastructures or institutes.

Bilateral programmes

SSF's programme for international cooperation covers East Asia (Japan, South Korea, Taiwan) and Israel. These countries are characterised by internationally high-ranking research and market

potential. Calls are made at selected times in cooperation with respective country.

AD HOC EFFORTS

Ad hoc efforts are made when SSF finds it necessary. A recent example is the start-up support for the Swedish-led EU research programme **Battery 2030+**.

Application help for Horizon Europe

From 2021, SSF is offering targeted support aimed at significantly increasing Swedish participation in the EU's research programme Horizon Europe (HEU). The goal is to act as a lever for increased HEU funding for Swedish research by offering application support for researchers. Hence, funding is available to cover time, travel, and consultancy service costs spent whilst applying for HEU grants under Pillars 1 and 2. The target group is highly merited Swedish researchers looking to engage in HEU projects of strategic relevance for Sweden.

UTILISATION OF INFRASTRUCTURE

Research infrastructure is an often-overlooked strategic success factor for research and utilisation. The government is principally responsible for the provision of large-scale infrastructure. Decisions regarding medium and small-scale investments in, for instance, labs and instruments, are made at university level. For this reason, SSF does not invest in infrastructure. However, we do support projects where infrastructure (both Swedish and international) is used and encourage researchers to develop this through their own activities.

Sweden needs to capitalise on its major investments in, for example, MAX-IV, ESS, and



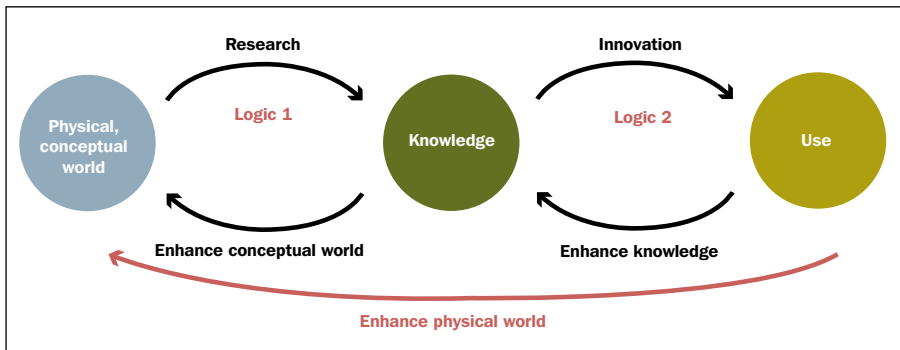
SciLifeLab. Also, infrastructure-like efforts are needed within IT in order to secure digital sovereignty for Sweden and Europe, as are various types of testing and demonstration facilities. Similarly, investments made in industry take on an infrastructure-like nature in semiconductor and battery plants, CO₂-free steel production, and “vaccines factories”, interacting with research. Here, SSF’s various career and mobility programmes can provide positive impetus.

SSF contributes to the fulfilment of the research infrastructures’ societal contract by providing grants for, among others, key people who within their position and as a main career work to develop such labs and instruments/ techniques/methods/databases, and to remove obstacles for more users, including attracting applications within industry.

SSF is currently conducting a coordinated research effort through a coherent and scalable digital infrastructure for data, communication and computation. This is a mainstay for further digitalisation in Sweden. Needs that emerge from this are, for instance, digital

autonomy and cybersecurity. This will enable us to be in control of the digital infrastructure upon which we are becoming increasingly dependent. A significantly increased energy efficiency in applications for information, communication, and systems technology will be required to achieve good sustainability. For Sweden to better meet its needs, SSF is investing about SEK 1.2 billion on basic research that could have an enabling effect in 10+ years’ time. Examples include the frame-work programmes: *Big Data and Computational Science*, *Computing and Hardware for ICT Infrastructures*, *Cybersecurity and Information Security*, *Future Software Systems (announced in 2021)*, and *Smart Systems*.

During the current strategy period, SSF intends to finance an extension of its **Swed-NESS** neutron scattering graduate school, adding a post-doc programme aimed at the school’s approximately 40 PhD students graduating in the next few years. Thereafter, the most successful post-docs will be offered repatriation support at a Swedish university, through targeted SSF Ingvar Carlsson Awards.



SSF supports research that generates new knowledge and use for society, according to its respective logic. Feedback in the system leads to a developed world.



The 2019 SSF Utilization Prize was awarded to Maria Strømme, Carlota Canalias, and Håkan Engquist.

The idea is to retain strategic competence in Sweden. SwedNESS is heralding a major expansion of the user base for applied neutron scattering and is strengthening Sweden's research as well as industrial development at ESS. In this way, SSF's targeted initiatives should contribute to the country's long-term competitiveness.

RESEARCH UTILISATION

As explained above, basic research and utilisation need to work more hand in hand. Therefore, SSF seeks to prioritise research areas where there are extra urgent needs/opportunities, and wants to reward projects that include innovation and the utilisation of basic research. In grant applications, researchers indicate how they intend to utilise the project results, for example through technology transfer, industrialisation, demonstrators (new functional or technology concepts) or imma-

rial rights, as well as new treatment methods in healthcare. Three percent of each major research grant (such as MRC, framework grants, and FFL) is reserved for such utilisation. Researchers can use the funding for proof-of-principle studies, patent applications, clinical trials, and commercialisation, among other things.

Particularly successful utilisation initiatives within projects financed by the Foundation may be considered for SSF's Utilisation Award. In addition, SSF emphasises the value of researchers interacting directly with industry and healthcare, etc, as well as with the universities' innovation offices and holding companies, and research institutes, using these as bridges for utilisation between academia and industry.

- SSF is all this.



SSF
Research that Shapes the Future

The cover art was made by Nina Roegind and features a detail from a painting by Hedda Gumpert, which can be seen at the Foundation's office.

-Welcome!

SWEDISH FOUNDATION FOR STRATEGIC RESEARCH

- Works to reform Swedish research towards excellence and impact.
- Creates bridges between basic research and needs-motivated research where results will be utilised.
- Supports research and postgraduate training within engineering, medicine, and natural science in order to strengthen Sweden's future competitiveness.
- Continuously funds 300 projects at universities – many of them in collaboration with industry and research institutes.
- Makes targeted research initiatives, often of an inter- and multidisciplinary nature
- Distributes career grants to prominent research leaders, with emphasis on younger talents.
- Encourages the mobility of researchers around the world, as well as between academia, institutes, industry, healthcare, and other players in society.
- Contributes to the creation of research instruments, methods, and techniques as well as skills for research infrastructure.
- Annually distributes grants worth SEK several hundred million.



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