SWEDISH FOUNDATION FOR STRATEGIC RESEARCH

Influence

of Swedish Foundation for Strategic Research Funding for Utilization of Research Results 2009-2021

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1. Preface

Since 2009, the Swedish Foundation for Strategic Research (SSF) has allocated 3% of larger grants promoting utilization of research results generated within projects. In 2021, SSF decided to investigate the impact of utilization projects during the period 2009-2021. More than 160 project grants were analysed in the study, based on a questionnaire to the project leader and interviews.

During 2022-2024, a European Reference Group (ERG) has compiled this report in liaison with SSF.

I thank the members of the ERG and express my sincere gratitude to them for their important expertise and diligent work with this study.

The contribution from all previous grant holders are also highly appreciated.

Stockholm April, 2024

Lars Hultman
CEO
Swedish Foundation for Strategic Research - SSF

2. Executive summary

The Swedish Foundation for Strategic Research (SSF) has since 2009 allocated 3% of larger grants to the utilization of research results, to be used at the discretion of the grant holders.

The study is based on an in-house desktop review of final reports and applications for utilization projects, a digital questionnaire to main grant holders, interviews with some of the main grant holders, and an international comparison. The study material covers 166 projects during 2009-2021 with a total budget of € 281 million.

It has focused on four specific questions from which the following conclusions are derived:

Question	Conclusion
Q1: Does SSF's utilization fulfil the foundation statutes' requirements for "development of Sweden's future competitiveness"?	**C1.1:** SSF's utilization grant significantly increases the utilization in SSF projects. The utilization grant also contributes to follow-on utilization in other projects by strengthening researchers' mindset towards utilization as well as their capacity for industry collaboration.
Q2: Does SSF's utilization meet the researchers' needs and does it stimulate them to become further involved in utilization?	**C2.1:** The needs are met for the majority of researchers with regard to the size of the funding. However, projects where the utilization grant was perceived to be too small might include cases that require high-risk downstream research and market entry, but which have great potential for utilization and impact. **C2.2:** The researchers' needs are met to a significant extent with regard to the complementarity of the SSF utilization grant and other sources of funding. **C2.3:** The number and share of respondents that would have opted for similar utilization efforts are quite small, which indicates that the utilization grant is largely attuned to the needs of the researchers and that the utilization grant acts as a catalyst that enables utilization. **C2.4:** The information given to researchers about the utilization grant during the project can be improved. C2.5 As many found it easy to apply for utilization funding and a few found it difficult, the needs of the researchers are largely met. **C2.6***:* SSF's utilization significantly stimulates researchers to engage in utilization. Utilization arenas can be put in place to increase the stimulation and experience sharing even further.
Q3: Utilizing or not utilizing – what are the major deciding factors?	**C3.1:** SSF should continue to ensure that researchers whose work involves both basic and applied research apply for SSF funding, as well as researchers whose work involves basic research with a long-term potential for utilization. This is done by further clarifying that SSF targets these researchers. **C3.2:** The availability of the utilization grant is in itself an important deciding factor for utilization and should as such continue to be a component of the future SSF approach to stimulate utilization. **C3.3:** Future application procedures should be developed from the point of view that it should be easy to apply for utilization.
Q4: What good examples are there in SSF's utilization and internationally?	**C4.1:** Internationally, there are no funding organisations fully comparable to SSF. The closest funding schemes which have been analysed are EIC Transition at the European Commission and SPRIND in Germany. **C4.2:** The international comparison confirms that utilization grants are important for stimulating utilization. The comparison also shows that the relatively small size of the SSF utilization grant, the lack of follow-up funding, and limited direct support to researchers might limit the extent of SSF's approach towards meeting the defined statutes.

A set of general conclusions can be drawn from the investigation:

• Most of the researchers are satisfied with the purpose of the utilization grant, i.e., to contribute to the development of Sweden´s competitiveness.

• Most of the researchers think that a utilization grant of 3% is sufficient and meets their needs, however, some emphasize the need for greater flexibility in terms of usage and size - in particular respondents in projects that require high-risk downstream research and market entry, but which have great potential for utilization and impact.

• Most researchers are positive and believe that the funding has stimulated them to become involved in utilization.

The overall conclusion is that the utilization grant has played a significant and positive role. It has strengthened researchers' mindset towards utilization, and it has increased the utilization outcome from projects and given applicants a sense of legitimacy. It is well viewed among researchers since it is complementary to other funding, quite easy to apply for, the amount is enough in most cases, and it can be used rather flexibly.

Despite these positive influences of the scheme, ERG has found opportunities for improvement - both directed at SSF but also towards SSF's role in the innovation ecosystem as a whole and its collaboration with other actors. Therefore, the following five recommendations to SSF are made:

R1 Require that university support functions are aware that utilization grants are applied for, and that they are committed to assist where needed.
R2 Increase the flexibility of size and usage of the utilization grant.
R3 Extend the time to apply for and use utilization grants after project completion.
R4 Engage more systematically in dialogue with other funding organizations with an interest in utilization.
R5 Arrange continuous meeting arenas about utilization, including demand-side actors such as companies, users, citizens, or investors.

3. Background

From the inception of SSF, utilization[1] – defined as "activities intended to ensure that research results impact upon and create value in society as well as being of significance for the development of Sweden's long-term competitiveness"[2] - has formed part of SSF's statutes. In 2009, SSF decided to strengthen all major research grants in order to actively stimulate the utilization of research results. Hence, the Board decided to set aside 3% of all major grants for utilization, over SEK 5 million.[3] Projects can apply for utilization funding on a voluntary basis during the project duration. This was formalized by the introduction of a new paragraph/annex to all larger grant contracts - see Appendix 10.6. From a policy perspective, this implementation of utilization projects was unique in the Swedish system at the time. To be noted is that researchers in Sweden have the rights to the intellectual property of the research results and immaterial assets that they develop.

In recent years, the expectations of utilization and of research results yielding societal impact have grown. Public investments in research are more closely linked to utilization efforts, which in turn are linked more closely to the implementation of societal changes. At European level, the EU's current framework programme for research and innovation, Horizon Europe, has a clear focus on societal challenges and on utilization and innovation. In addition, the European Research Council (ERC) and the Swedish Research Council are financing utilization (Proof of Concept grants), and the European Innovation Council expanded on a similar scheme within the Horizon 2020 Future Emerging Technologies Programme (Innovation Launchpad) by offering a dedicated Transition scheme to bridge research to market. The Swedish foundation, Knut och Alice Wallenbergs Stiftelse, has a utilization program called Wallenberg Launchpad, WALP.

The Swedish government recently carried out a special inquiry, the Innovation Support Inquiry[4], with the aim of further developing the role played by higher education institutions for utilization and innovation. These factors are expected to make a clear mark on research policy and efforts from university management in the coming years. Several private IPR companies have also been formed for the commercialization of research results – e.g., SweTree Technologies, OBOE IPR.

In 2021, SSF decided to investigate the influence of its 3% allocation of grants for utilization projects that ended during 2009-2021. The study embraces 166 with a total budget of € 281 million, 2009 - 2021.[5]

In the SSF system, each project can apply for utilization funding within:

- Proof of Principle studies,
- Assessment of commercialization potential (max. SEK 150,000 per research idea),
- Costs related to patenting (max. SEK 150,000 per research idea),
- Other forms of utilization.

In practice, each grant holder (main PI) can apply for different utilization projects, i.e. with different research results or intellectual assets, up to the 3% set aside from the total grant during the project period.

Roughly € 6 million have been used for about 400 utilization projects. 60% of the utilization funding has been used for Proof of Principle studies, 13% for Assessment of commercialization potential, and 24% for Patenting.[6]

1. The word exploitation and utilization are used synonymously by SSF and also in this report.
2. From SSF's statutes: " §1. The objective of the Foundation, which shall be known as the Swedish Foundation for Strategic Research (Stiftelsen för Strategisk Forskning), shall be to support research within natural science, engineering and medicine. The Foundation shall promote the development of strong research environments of the highest international standard and of significance for the development of Sweden's long-term competitiveness. "
3. There are exceptions, but those programmes are excluded in this study – see Chapter 5.
4. Swedish state public inquiry: Innovation som drivkraft - från forskning till nytta, Betänkande av Utredningen om ett utvecklat innovationsstöd vid universitet och högskolor, SOU 2020:59, Stockholm 2020.
5. € 1= SEK 11.9 (2023-03-03)
6. Approx. 3% have been used for other forms of utilization, e.g. construction of database or prototype. Average duration of the projects was 5.87 years.

4. Objective

The objective of this study is to answer four main questions:

1. Does SSF's utilization fulfil the foundation charter´s requirements for "development of Sweden's future competitiveness"?

2. Does SSF's utilization meet the researchers' needs and does it stimulate them to become further involved in utilization?

3. Utilizing or not utilizing - what are the major deciding factors?

4. What good examples are there in SSF's utilization and internationally?

By answering the questions, the ERG intends to provide SSF with advice and recommendations for improving the policies for and execution of utilization projects in SSF's future programs. The conclusions are presented in Chapter 9.

A set of five recommendations, based on interview data and survey data, are presented in Chapter 8.

5. Boundaries and methods

The study is based on an SSF in-house desktop review of final reports and applications for utilization[7] projects (Appendix 10.1), a digital questionnaire to grant holders (Appendix 10.2-4), online interviews with four of them (Appendix 10.5), and a comparison with two international schemes. A European Reference Group (ERG) was tasked to outline the major conclusions from the in-house review and results from the questionnaire, both performed by SSF. The ERG interviewed four grant holders and made a comparative study of two benchmark examples in funding schemes outside Sweden. The members of the ERG have extensive experience in the area of utilization of research results. The members of the group are introduced in brief CVs in Appendix 10.7.

SSF has analysed final reports and applications for utilization projects where the earliest end date was 2009-07-01 and the latest end date 2021-12-31. Only grants of over SEK 5 million were included, for these 3% of the total budget were set aside for utilization efforts.[8] Some programmes were excluded since they had no explicit utilization budget. One example is the Ingvar Carlsson Award programme for young researchers. These awards are mainly intended to build up research groups at early stages, rather than to produce research results that potentially can be utilized. The total budget of these excluded awards amounts to SEK 160 million, which is less than 5% of the total budget of the projects included in this study. Finally, the study did not analyse any project that was prematurely cancelled/terminated by SSF.

The analysis of final reports and applications for utilization projects provides basic data on the category of utilization, i.e. proof of principle research, patenting etc, and results from utilization projects until the end of 2021. Quantitative data from this analysis are presented in Appendix 10.1.

In total, 166 projects were identified as eligible for utilization funding.

From a methodological viewpoint it is challenging to identify the added value of the utilization grants, i.e. to what extent utilization would have happened without the 3% utilization funding. While this issue is not within the explicit scope of this study, and certainly not at all quantified, the study has, to some extent, tried to understand this through questions in the questionnaire and interviews.

As indicated by the name, this study did not investigate the extent of the actual societal impacts from utilization. This means that the study will not point to any impact on industry or other society sectors in terms of economic or other kind of long-term impacts as a result of the 3% utilization grant. It only aims to assess whether the utilization grants as implemented are successful in incentivising, triggering and ramping-up utilization work in real terms. In any case, the long-term external impact of SSF's efforts is very challenging to investigate. From a methodological point of view, it is hard to identify the impact of the projects since they finished rather recently. It's also hard to justify and causally link a single utilization result to an impact on industry, typically 5-10 years after the utilization project ended, considering also the relatively small size of the utilization grant. Another complication is that any impact in the form of innovations[9] normally derives from multiple utilization efforts at different times over a long period and from different stakeholders, e.g. different research results from different research groups, and as a result of a range of exogenous factors, e.g. the investment landscape.

7. The word exploitation and utilization are used synonymously by SSF and also in this report.
8. Average budget for a project was € 1.7 million. Maximum € 2.9 million
9. Here defined as: Innovation is production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and the establishment of new management systems. It is both a process and an outcome. Source: Edison, H., Ali, N.B., & Torkar, R. (2014). Journal of Systems and Software 86(5), 1390–407.

6. Analysis of final reports
and applications for utilization of research results

All 166 eligible projects have sent a final report to SSF and could use 3% of the approved grant during the project period i.e. 2009-2021. The first set of data from SSF's project database is presented in Figure 1, where the utilization rate is presented.

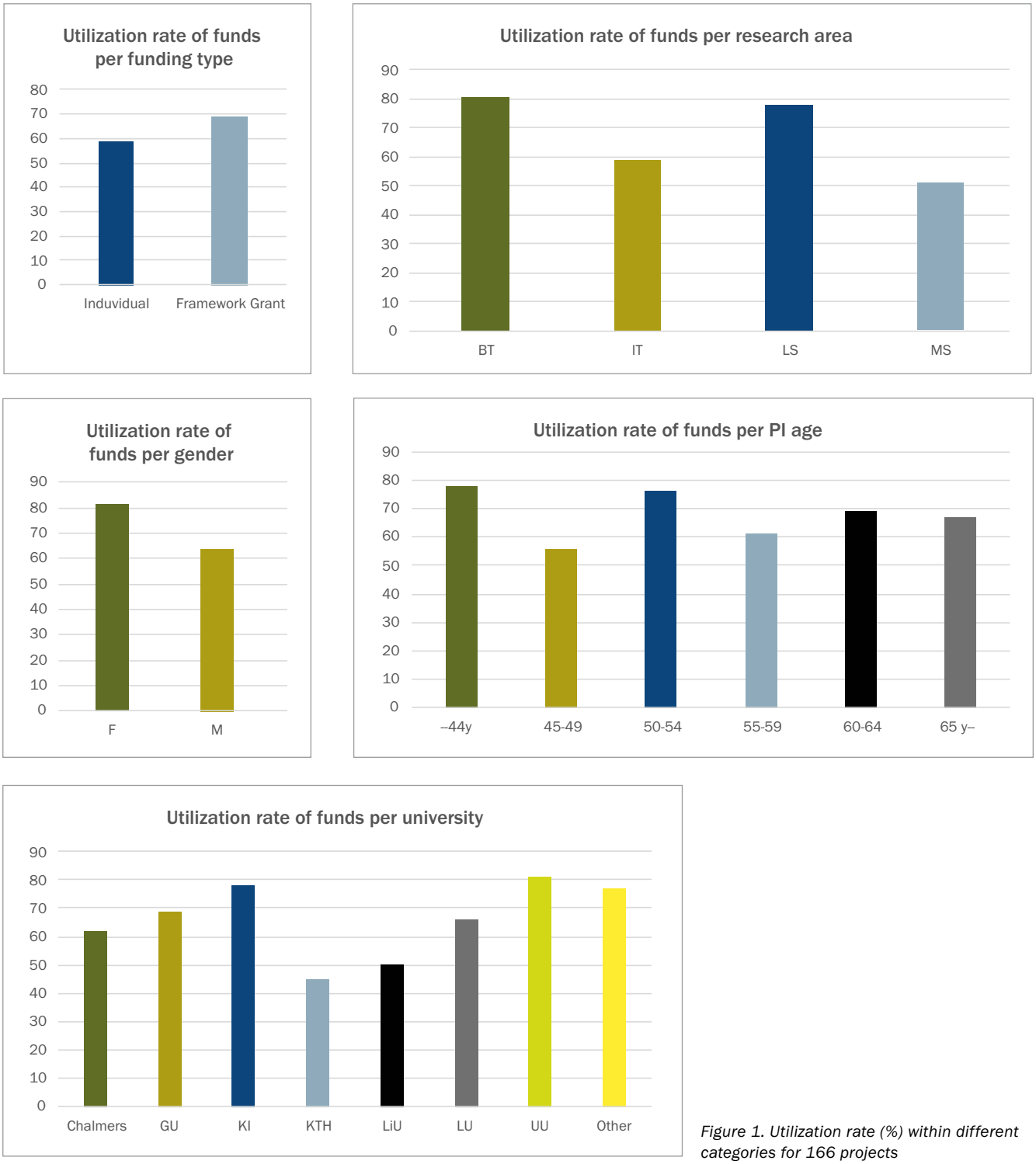
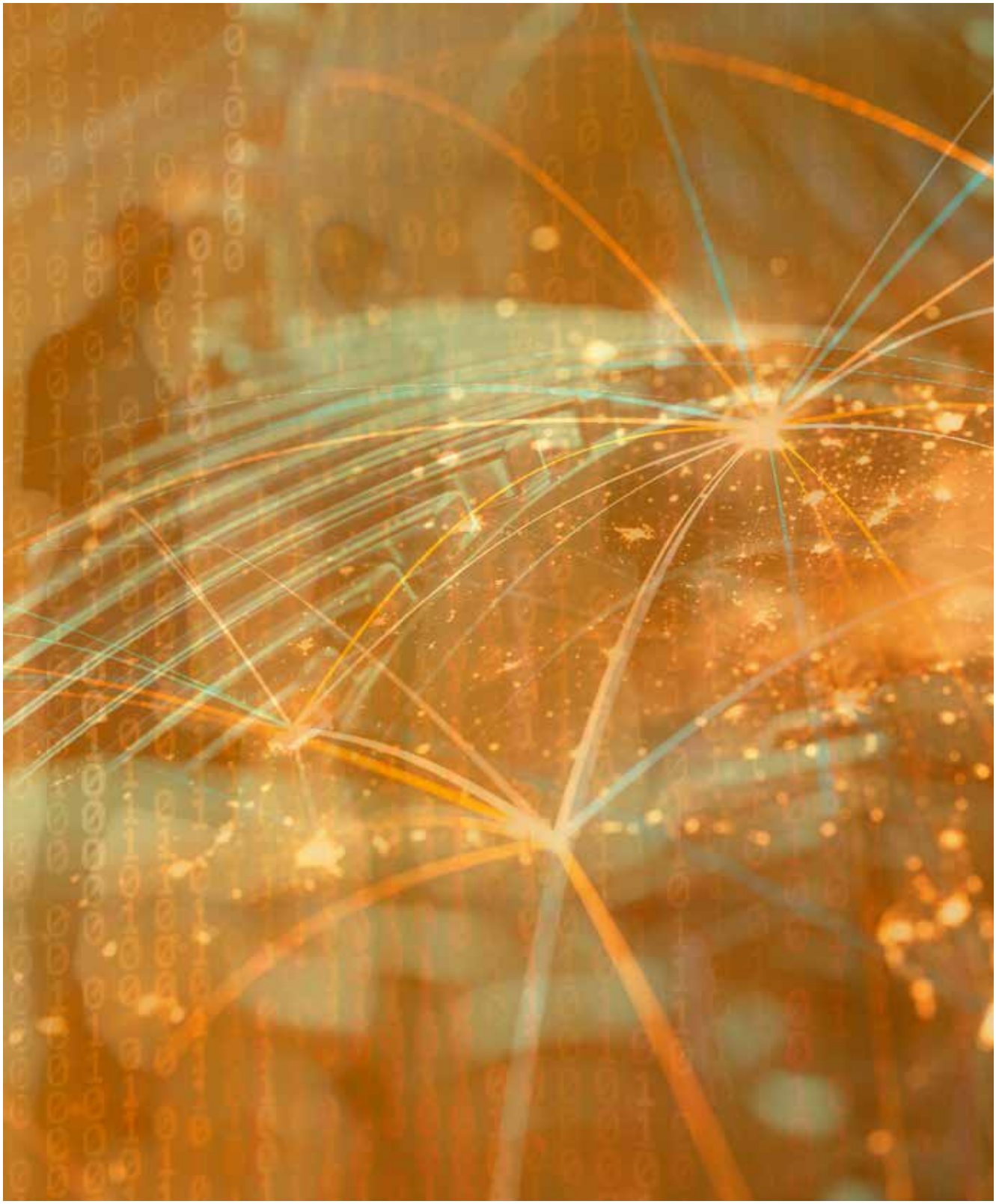


Figure 1. Utilization rate (%) within different categories for 166 projects

The projects had a total budget of € 281 million, of which approximately 2% was used for utilization projects.[10]

The total utilization rate for the period was 71% of available utilization budget. The distribution of the utilized money for different research areas is presented in Figure 2. Life Science (LS), where 44% of the respondents of the survey were active, are clearly the most intensive users of utilization grants, while Advanced Mathematics (AM) are the least intensive ones. LS also have the biggest share of actual budget to projects, Figure 3.



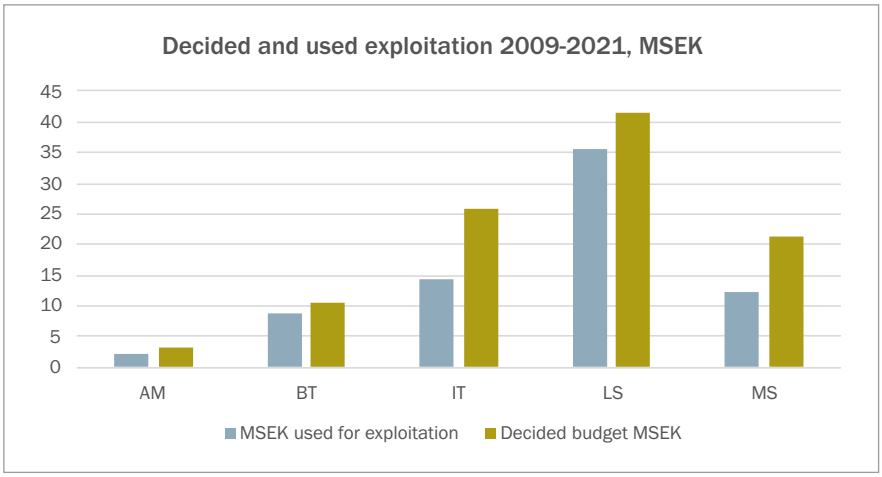


Figure 2. SEK used for utilization in 2009-2021 in the areas of Applied Mathematics (AM), Biotechnology (BT), Information Technology (IT), Life Science (LS) and Mathematical Science (MS).

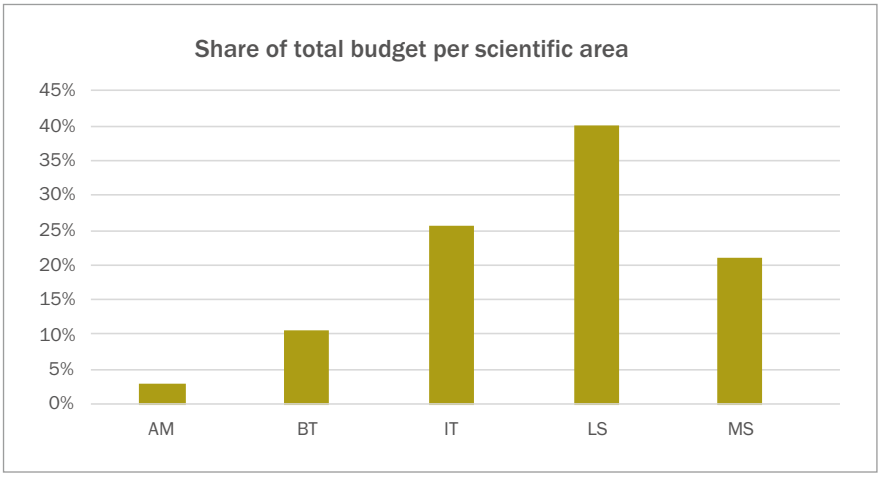


Figure 3. Share of total budget (€ 281 million) per scientific area 2009-2021.

In total 424 applications for utilization projects were approved by SSF. 60% of the approved budget was for Proof of Principle research, 13% for assessment for commercialization potential, and 24% for patenting. In total 266 patents were filed and/or approved, and 58 startup companies were claimed to have been set up because of the projects. The projects also reported utilization in the form of demonstrators, pilots, platforms, protocols, standards, e.g., for healthcare, models, software, and "secrets" beneficial for/transferred to society.

25 of the 166 projects did not use the 3% at all. Some of those projects argue in their final report that this is because of the type of research conducted, i.e., basic research. About half of these projects have pursued utilization without SSF funding. Those projects have produced 24 patents and 2 startup companies. The reason why these later projects proceeded with utilization efforts without taking advantage of the SSF utilization funds is unknown but might be worthwhile addressing.

The ERG does not consider it necessarily a failure of the utilization grant scheme when a project does not use the opportunity. If utilization were to be considered as an up-front must in each and every project, the nature of the research would be artificially biased, probably away from the riskier research that could, in the longer run, have great impact.

Detailed data from the analysis of the final reports and applications for utilization of research results are presented in Appendix 10.1.

10. € 289 million were decided, € 281 million were actually paid to the projects of which € 6 million for utilization. € 1 = SEK 11.9

7. Results from interviews with PIs and the international comparison

Four PIs, all with previous participation in an SSF project, were interviewed by ERG. The projects cover Materials Science, Information Technology, Biotechnology and Life Science. The interviews were conducted digitally during spring 2023 and lasted around 90 minutes for each PI. The interviews centred on the questions in Appendix 10.5.

The contents from all interviews were aggregated in a data matrix consisting of respondents and answers. From the data matrix, 12 main Statements were generated. Each of the Statements was then matched with the questionnaire data to see if and to what extent they were supported and if additional details could be added.

In addition we interviewed representatives from two international funding schemes; SPRIND[11] in Germany and the European Innovation Council (EIC), at the European Commission.

These data sources constitute the basis for a set of five recommendations for how SSF could adopt its approach to stimulate and support utilization moving forward.

7.1. Interview Statements and questionnaire responses

In the following we present Interview Statements 1-12 (S1-S12) further corroborated by the questionnaire responses.

S1 Initially, it is hard to know what the best utilization efforts are, how much they will cost, and when they will have an impact.

Figure 31, Appendix 10.2., shows that well above 70 out of the respondents see potential for utilization after project completion, but only 11 respondents see no potential. The question asked was: "If additional SSF funding had been available, would you have used the opportunity for utilization of the project results after your project was finished?". This raises the question if the current period of six months after project end date in wich to use the utilization grant is sufficient or if it should be extended.

S2 The utilization grant is too small.

The interviewees pointed out that the utilization grant was too small in relation to the utilization needs and opportunities of the projects.

This Statement should be put into the context of Figure 29 that shows that over 80 respondents believed a utilization grant of 3% was about right and almost 10 respondents believed it was too small. Interviews conducted with PIs did however indicate that certain projects, especially those that require high-risk downstream research and market entry, but which have great potential for utilization and impact, could benefit from additional funding, which would allow them to further develop and strengthen their utilization efforts.

S3 Utilization can increase by learning about utilization from researchers at other universities, from industry, innovation ecosystem representatives, SSF staff and other SSF projects.

The decisive factors in the answers to factors decisive for the utilization of research results, point at the importance of experience and collaboration with industry and other startups for encouraging utilization efforts. This shows that it is important to mobilise industrial companies and startups within the project context. This is something where university support functions might help, as well as researchers from applied research environments. In this sense the questionnaire data supports recommendations R1 and R7, see Chapter 8 Recommendations.

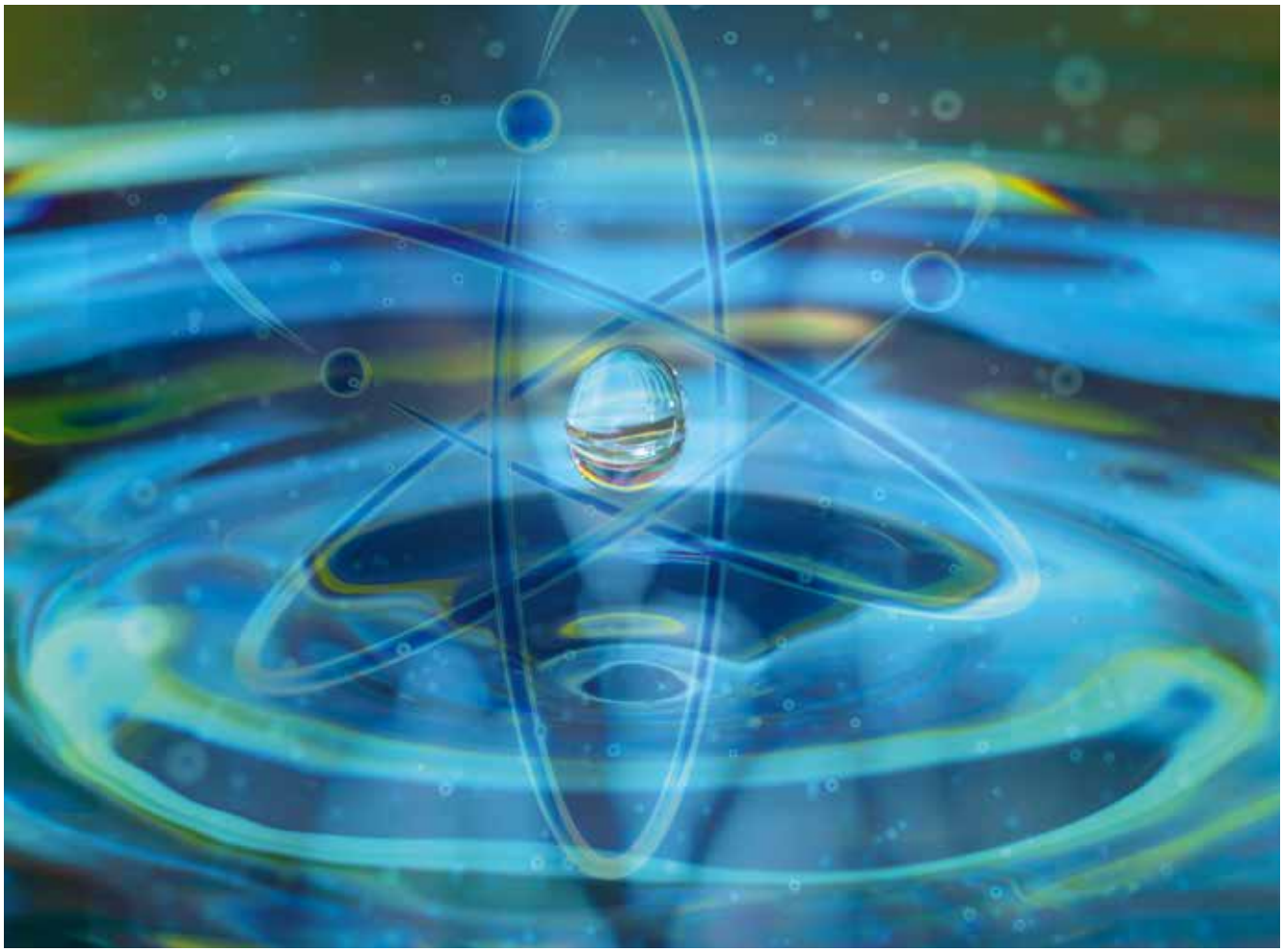
S4 There is potential for additional mechanisms close to the SSF project to further improve utilization.

The interviews emphasized the need to link people with an outside perspective on utilization to the project, for instance, industry mentors to increase researchers' understanding how to use the utilization grant, or researchers that may follow an entrepreneurial career at the university.

S5 Support from innovation offices and university holding companies is important.

Figure 35 supports this Statement and thereby the recommendations that are based on it (R2 among others, see Chapter 8 Recommendations). Figure 35 shows that just fewer than 40 respondents would like to get more utilization sup-

11. https://eic.ec.europa.eu/eic-funding-opportunities/eic-transition_en and www.sprind.org



port from university support functions, and around 55 respondents would not. The question asked was: Would you have liked more support from the university with regard to utilization during the project?

The framing of the question does not take into account what utilization support the applicants have received from the university. For example, it is unclear on what the 55 respondents that would not like more support base their answers on. It could, for instance, be that the relationship with the support function is well functioning and sufficient, or that they see the support as irrelevant/inappropriate during a particular phase of their project. There could also be other reasons. Therefore, it is difficult to derive further recommendations from the survey results. However, interviews with the PI indicated that the university support function is a good complement to the SSF funding.

S6 Utilization support is needed already at the stage when the application is written.

The interviewees pointed out that utilization support is needed when writing the application. This corresponds well with the survey data (Figure 35) that point to the importance of support from university support functions.

S7 The utilization grant gives legitimacy and recognition to applicants.

Interviewees underlined that the SSF research grant in general as well as the utilization grant gave legitimacy and made it easier to approach other actors like, for instance, Vinnova.

S8 The SSF utilization grant was complementary to other utilization funding.

Figure 27 shows that more than 60 respondents (out of 100) confirm that the utilization grant complements other funding. Along similar lines 28 respondents answer that the utilization grant is unique in the Swedish system. These answers support the Statement and underline the importance and significance of the SSF utilization grant.

S9 Utilization mindset and previous experiences of utilization among the co-applicants is important for the decision to include utilization efforts in the project. No links to survey data are highlighted.

S10 The utilization grant and efforts changed researchers' mindset towards utilization in general.

Survey data points in the same direction, and Figure 22 shows that 59 respondents thought that SSF's utilization had to a great extent stimulated them to engage in utilization. Adding respondents who felt that they had been stimulated "to some extent" brings the figure to 95 respondents, which includes the vast majority of respondents.

S11 We would have included utilization efforts even if there were no utilization grant.

Figure 30 shows that around 17 respondents would to a great extent have included utilization efforts also without the SSF utilization grant, and that just over 60 respondents would have done so to some extent. In this sense, Figure 30 supports the Statement.

However, the 17 respondents represent a clear minority of respondents (16%) and it seems that the utilization grant played a significant and positive role for the remaining respondents that would have engaged in utilization to some extent or not at all.

S12 The utilization grant played a key role in our project.

As mentioned in relation to S10, survey data (Figure 22) shows that 59 respondents thought that SSF's utilization had to a great extent stimulated them to engage in utilization. This can be interpreted to be aligned with this Statement.

The Statement seems to be strengthened by Figure 27 where 63 respondents say that the utilization grant complements other funding, and 28 respondents say that the grant is unique in the Swedish system. This seems to offer a part explanation why the utilization grant might have played a key role.

7.2. International examples and comparison

It has been the ambition of the ERG to set SSF's utilization funding scheme in an international context. The purpose of the international comparison was to learn from other examples which can inform the committee's recommendations. The purpose was also to position the recommendations in relation to funding organisations outside Sweden.

Several different international funding organisations were identified and no approach fully identical to SSF's was found. The closest ones were EIC transition at the European Commission and SPRIND in Germany. The summary and analysis below are based on secondary data as well as interviews with representatives from these organisations.

EIC Transition - European Commission

At European level, the EU's framework programme for research and innovation, Horizon Europe, has a clear focus on societal challenges and on utilization and innovation. In addition, the European Research Council (ERC) is financing utilization projects through programmes such as the ERC Proof of Concept (PoC).

While the ERC utilization funding is expected to function as an early validation mechanism, preparing projects and applicants to progress from ground-breaking research towards innovation, the European Innovation Council (EIC) funding is designed to support and nurture innovation and entrepreneurship.

EIC funding programmes include EIC Pathfinder (TRLs[12] 1-2 to 3-4), EIC Transition (TRLs 3-4 to TRLs 5-6) and EIC Accelerator (TRLs 5-8). The EIC programmes represent a well-thought-out progression of funding support meant to take ground-breaking innovation on the journey from lab to market. In addition to the above-mentioned programmes, EIC offers a broad range of additional support such as Booster grants, equity investments, prizes, and Business Acceleration Services. This latter support includes access to coaching and mentoring, expertise, and ecosystem partners.

For the purpose of comparison, EIC Transition was chosen. Both SSF's utilization and EIC transition aim to support utilization and to help applicants take the first steps from lab to market.

The EIC Transition programme aims to propel innovation beyond the experimental proof of concept stage in laboratories. The objective of the EIC Transition funds is to mature novel technologies (from TRL 3 to 5) and to develop robust business cases for commercialization. Similar to SSF, EIC aims to increase the competitiveness of the EU by bringing ground-breaking technologies to market. As opposed to EIC, however, it is worth noting that the SSF funding scheme does not have a natural next funding step within SSF or at the national level in Sweden. This, and the relatively small amount of funding compared to EIC, impacts what can realistically be expected as an outcome from the SSF utilization grant. Increasing the flexibility of the SSF grant (see R2 in the Recommendations chapter) and engaging in dialogue with other funding organisations aimed at offering a natural next step funding (see R4 in the Recommendations chapter) would work towards increasing the likelihood of societal impact of SSF projects.

Another difference between the SSF funding scheme and the EIC Transition projects is the horizontal support[13] focused on coaching and business acceleration services such as mentoring, access to global partners and innovation ecosystems. According to the interviews with EIC, this is an important function that supports the development of a robust business case for the projects and gives the applicants the ne-

cessary tools to drive the utilization efforts forward. In addition to the support given by EIC personnel the EIC actively encourages the Technology Transfer Offices (TTOs) of universities to get involved in the application phase as well as to provide services to the projects. This indicates that a variety of competences and support functions are needed in order to go beyond inspiration and curiosity and to encourage successful utilization of research results from lab to market (see R1 and R5 in the Recommendations chapter).

So, while the aims of the EIC transition and SSF's utilization grant are similar, the scope of the SSF funding makes it, in practice, more similar to the ERC PoC or the EIC Booster programmes. The ERC PoC offers € 150,000 to applicants and aims to function as an early validation mechanism, preparing projects and applicants to progress from groundbreaking research towards innovation. The EIC Booster is offered on an invitation-only basis to EIC Pathfinder and EIC Transition grant holders. The EIC Booster gives applicants a maximum of € 50,000 for "complementary activities to support pathways to commercialisation". Both the ERC PoC and the EIC Booster help to mature the technologies and prepare the applicant to take the next step towards utilization and/or commercialisation.

SPRIND

Established in 2020, SPRIND is the German agency for disruptive innovation to underpin products, services and systems that can contribute to meeting social, ecological, and economic challenges. To achieve this, they aim to bring together new thinkers from science and business, people with outstanding ideas, special expertise, and passion. For this work they have a budget of approximately 200 million Euros. They provide grants, equity investments and loans, and they establish companies.

SPRIND primarily supports projects ranging TRLs 3-7 in all areas. The focus is on each specific project, thus there are no predefined funding categories or different funding stages like "proof of concept" or "patents". It is the specific project that has to define its needs. As such, SPRIND can support both societal, ecological, and economic-oriented projects. The bottom line is that the projects have to have the potential for disruptive innovation.

SPRIND evaluates the projects on a list of criteria that are continuously under development. Currently there are about 100 projects in the portfolio. The main means of SPRIND are funding, helping to put together teams and linking them with the right networks from science, business, and politics. They have around 400 experts in their network that includes Nobel laureates among others. They also have extensive collaboration with TTOs (it should be noted that universities in Germany own the IPR, unlike in Sweden where the researchers own the IPR).

Since this is an agency with the aim of disruptive innovation, they need to take high risks and have a long-term perspective on their projects. All projects go through a validation study, approximately 200 000 Euros per project, lasting 3-9 months. In this process, both the projects and the teams are validated and qualified for further processing. SPRIND is very hands-on - teams will not succeed because of funding, they need to have the right attitude. Thus, many among the staff at SPRIND are former successful entrepreneurs.

SPRIND further arranges meetings between the projects and potential investors. Having gone through a SPRIND validation process also serves as a label of quality for potential investors.

Compared to SSF, SPRIND has a broader task, considerably more funding, and an overarching role in the system. There are, however, some inspirations that can be taken from the German scheme. One is that there are no predefined categories, thus opening up for all sorts of projects that may have social, ecological and economic impacts. This allows for a broad definition of utilization. Another is that the scheme emphasizes the importance of mentoring entrepreneurs. The philosophy is that funding without an entrepreneurial spirit and interest is not viable. A third is the national coordinating role of SPRIND where they gather diverse actors and stakeholders into the system. Although SSF, given the size of the utilization grants, cannot take on a national role in this respect, there seems to be a need for an agency that has the capacity, legitimacy, and competence to serve as an arena for networking and matching.

Summing up, albeit the two international examples differ considerably from SSF utilization funding particularly in terms of size of funding and system level capacity, they show the importance of such funding for stimulating utilization. The two cases underline the importance of flexibility, mentoring, involvement of support structures, and follow-up funding.

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12. TRL: Technology Readiness Level, a scale which shows the development of technologies from basic principle (TRL1) to applicability in relevant environment (TRL9) https://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-g-trl_en.pdf

13. All the EIC Awardees (EIC Accelerator, Pathfinder, Transition and WomanTech EU) have access to the EIC Business Acceleration Services (BAS). The services are offered through the EIC Community Platform and are developed by EIC itself or by the EIC Community Partners.

8. Recommendations

In the following we present Recommendations 1-5 (R1-R5).

R1 equire that university support functions are aware that utilization grants are applied for, and that they are committed to assist where needed.

Builds on

S3, S5, S6, S7, S8, S9, S10 as well as observations from the EIC Transition funding scheme.

Purpose

SSF requires that applicants inform university support functions that utilization grants are applied for. The support functions should confirm that they are committed to assist the applicants if needed. The purposes are:

• To stimulate applicants' learning about utilization and to develop a utilization mindset.

• To improve the quality of the application.

• To increase applicants' awareness of university support functions.

• To notify university support functions about the application, to prepare support functions that the application might be granted.

Considerations

What support services are offered and how support functions are organized vary across universities. In Sweden, support can be provided by innovation offices, grants offices, incubators, science parks or other entities. It could be that applicants require competence available at support functions located at universities in other regions. How applicants, or groups of applicants, have engaged or will engage support functions is beyond the scope and mandate of SSF and cannot be prescribed. There is an opportunity for SSF to encourage participation from university support function representatives in their own activities such as information meetings, webinars, and project startup meetings.

It is the experience of the Reference Group that interventions of university support functions in the application phase, i.e. very early on in the project (actually pre-project), can be beneficial but can also run the risk that the project becomes biased and directed towards specific forms of utilization. Such interventions may discourage some of the more interesting but riskier utilization routes.

Early interventions should be conducted so that the researchers get a clear sense that it is their thoughts and ideas that shape the utilization. This is of particular significance in Sweden that has an exemption by law for academic staff known as the 'Professor's Privilege'. This means that researchers hold the intellectual property rights to their research results and any intellectual assets they create, unless otherwise agreed.

One opportunity is to see to what extent researchers from previous SSF projects would like to assist in the application phase.

The recommendation is further supported by the conclusions of Q3 that point out that university support for utilization is the third most decisive factor for utilization.

R2 Increase the flexibility of size and usage of the utilization grant.

Builds on

S1, S2, S3, S8, and S12 as well as SPRIND comparisons and observations on how the EIC funding programmes are structured and linked.

Purpose

The overall purpose of the recommendation is to increase the flexibility of the utilization grant to support more types of utilization as well as grants of different sizes.

Therefore, we propose that projects can apply for an additional utilization grant, on top of the current one at 3%. The interviews support this, and they show that the categories in the current utilization scheme are perceived as too narrow. Therefore, we suggest that SSF emphasizes utilization in a broader sense when deciding on the additional grant and takes a standpoint in the needs of the specific projects rather than in any predefined category.

Regarding the size, we recommend that SSF turns the unused utilization grant funds into an additional 2% utilization grant that projects may apply for.[14] This can be done throughout the course of the project or after the project is completed.

Further, we suggest that a midterm utilization evaluation

is built into the project cycle with the following purposes:
• To revisit the utilization plan of the application and assess additional utilization routes emerging in the project.

• To stimulate applicants' learning about utilization and to develop a utilization mindset.

• To prepare for the possible application of additional utilization grants.

If special situations arise, i.e. situations where significant utilization potential is identified that needs to be reacted upon quickly, applicants should be able to apply for additional utilization grants at short notice. This can be done at any time during the project and after project completion.

The additional utilization grant can be used throughout the course of the project and also after the project is completed, see R3 below.

Considerations

The creation of an additional utilization grant that can be applied for by all projects will increase the flexibility of the grant and make it better tailored to the needs of specific projects. The interviews show that projects with utilization that require high-risk downstream research and market entry, but which have great potential for utilization and impact, will benefit from this. This is because these projects tend to require more utilization resources. Opening this additional grant to all projects will serve the purpose of increasing contributions to Sweden's competitiveness.

The midterm evaluation and the application for additional utilization should be designed in a way that minimizes the administration for the researchers and ensures that SSF allocates grants in a responsible way and to projects where the utilization potential is the greatest.

Utilization can take many forms and vary between scientific fields, academic environments, and industrial sectors. As with the initial application, where utilization is broadly defined and context dependent, this should be considered when designing the midterm evaluation and the application for additional utilization grants. For these, we suggest that the scheme removes the predefined categories.

It should be noted that the recommendation to increase the flexibility in using the grant is made even if at first glance it seems to be contradicting conclusion C2.3, that the utilization grant is largely attuned to the needs of the researchers and that the utilization grant acts as a catalyst that enables utilization. Even if this is what the survey data indicates, the interviews clearly show that there are projects where additional flexibility is needed. ERG believes that utilization in these projects is particularly important to nurture since they may have great potential for utilization and impact while requiring high-risk downstream research and market entry. This potential is also indicated by conclusion C2.1.

R3 Extend the time to apply for and use utilization grants after project completion from six to twelve months.

Builds on

S1, S2, S12.

Purpose

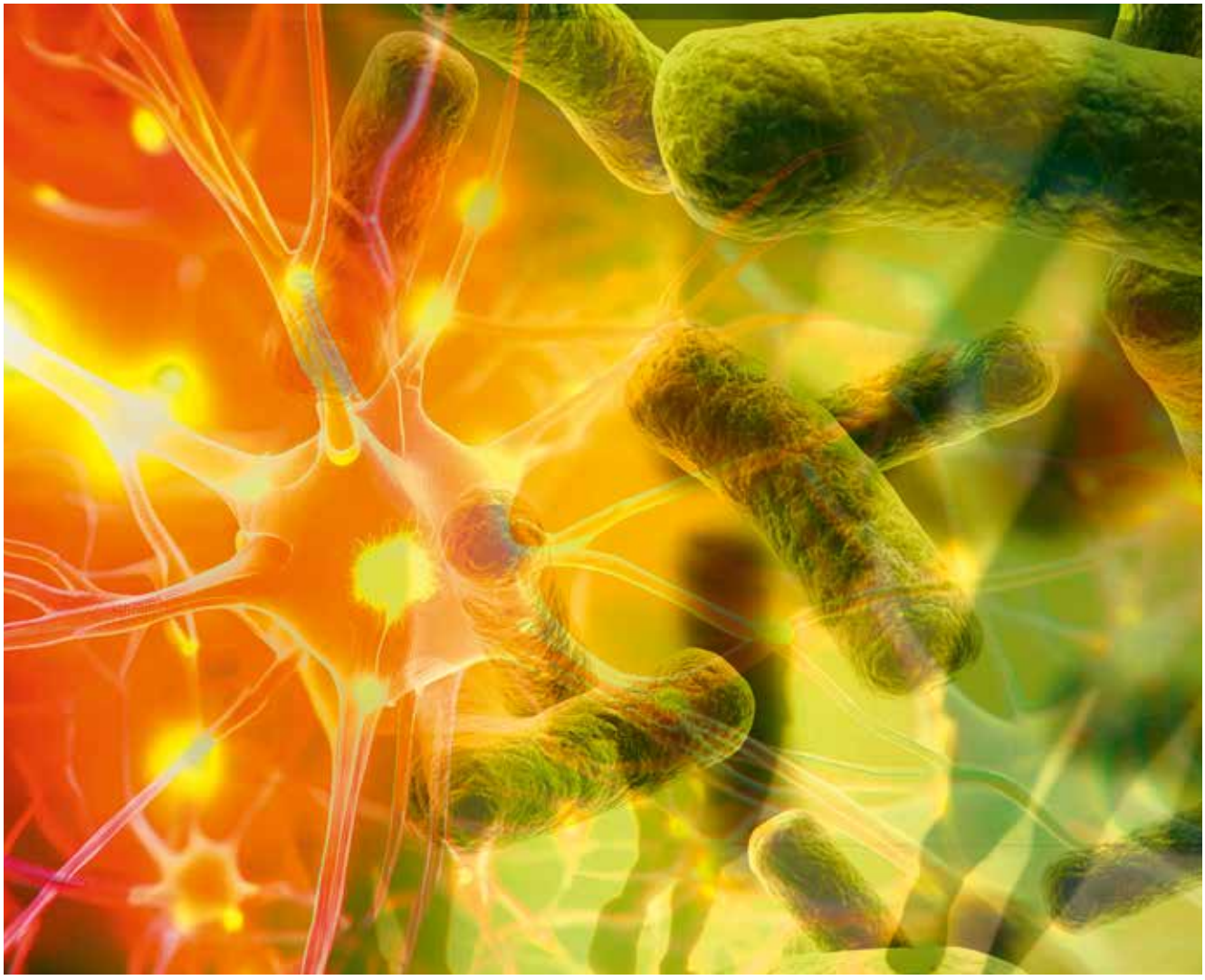
Currently it is possible to use the utilization grant up to 6 months after project completion. We recommend that this period is extended and that it is possible to apply for and use utilization grants up to 12 months after the project is completed. The purpose is to allow for more utilization opportunities to be pursued, as the project results also become more mature and ready for utilization.

Considerations

To increase the period for applying for and using the utilization grant from 6 to 12 months after project completion might result in additional administration for SSF. The portfolio of open projects will increase and the number of applications for the utilization grant will increase. SSF's general capacity needs to be adapted correspondingly.

It is also desirable to increase the flexibility of how the utilization grant is spent across different ideas and routes of utilization. We recommend SSF to be as flexible as possible in this regard, obviously provided that state aid rules and other applicable rules and regulations are observed.

14. The allocation of additional utilization grants gives rise to financing needs. It is difficult to predict how large they will be but it is deemed that they will be less than the difference between 3% of the total research grant (which is the current budget frame for utilization across all projects) and 2% (which is the actual spending within the budget frame). If the allocation for additional utilization grants is less than this difference it is assumed that it is possible to reserve the necessary budget for the additional utilization grant. A smaller budget can be allocated as well if desired. A "seal of excellence" and ranking procedure could be applied if the budget does not suffice, where a selection of top ranked projects will be given additional utilization grants.



The survey data (Figure 41) shows that around 26 of the 38 projects that did not use the utilization grant during the project (and the 6-month period after completion) engaged in utilization at a later stage. Some of these cases can be captured if the period is extended. It would also give more options to those that have used utilization grants within the current rules.

R4 Engage more systematically in dialogue with other funding organizations with an interest in utilization.

Builds on

S8 and the structure of and links between the EIC funding programmes.

Purpose

The overall purpose is for SSF to systematically engage in strategic and operative dialogue with other funding organisations with an interest in utilization. Other funding organisations may include the Swedish Research Council (proof-of-concept funding etc.), Vinnova (verification funds, Emerging Technologies/Framväxande tekniklösningar etc.), the Knut and Alice Wallenberg Foundation (Wallenberg Launch Pad/WALP) and the European Innovation Council (Transition etc.).

Further purposes are:

- To discuss collaborations, joint efforts and complementarity – in own calls, joint calls and related activities such as joint communication, conferences etc.

- To conduct strategic dialogue on how to stimulate utilization at project/programme level as well as at system level.

- To exchange business plans for utilization initiatives in the near future.

• To share experiences and work practices and to learn more about the latest developments in the utilization field.

The objective is to strengthen the complementarity between the collective utilization initiatives of all funding organisations.

One of the drawbacks of the current utilization scheme is that there is no pathway to other programmes that could substantially support the utilization efforts as needed, beyond what the SSF utilization grant can achieve. Such bridges should be explored at national and European level. For example, under the right conditions, a successful utilization grant may provide entry to the EIC Transition or fast-track into the EIC Accelerator scheme. Similarly, Vinnova may provide follow-up funding, under preferential conditions for successful utilization. Bridges to the defence industry, pre-commercial procurement, or investor platforms can be put in place in similar ways.

The discussion about collaborations and joint efforts can lead to the initiation of operational collaborations. They can include, for instance complementary calls, or outreach activities towards stakeholders or target groups.

Considerations

The strategic dialogue on utilization can be combined with a discussion about other issues of common interest to the funding organisations.

R5 Arrange complementary learning, mentoring and network building about utilization.

Builds on

S3, S5, S7, S10, S12 and international comparison.

Purpose

SSF can regularly organise meeting arenas, like workshops and conferences, on utilization with the following purposes:

• To continuously gather researchers in SSF projects as well as representatives from other stakeholder groups such as industry, university support functions, university management, funding organizations, seed investors and politicians.

• To engage stakeholder representatives in a continuous dialogue about utilization.

• To present plans, halfway results and results of utilization.

The objectives of the meeting arenas are:

• To increase learning about utilization and to stimulate a utilization mindset, primarily among researchers in SSF projects but also among other stakeholder groups like industry, university support functions, university management, funding organizations, seed investors and politicians.

• To increase incentives for and to inspire utilization among researchers, and to share good examples of utilization as well as catalysing learning and mentoring about utilization.

• To strengthen legitimacy and recognition of utilization efforts in SSF projects.

• To develop personal networks, between researchers with an interest in utilization and between researchers and experts that can offer utilization guidance to projects.

With regard to the development of personal networks between researchers and utilization efforts, as well as with other activities, it is important that SSF provides something that in general is unique and complementary to the utilization expertise already provided by university support functions and other mechanisms and initiatives.

Considerations

The main target group of the conferences are researchers in SSF projects. It is natural, then, to link conference content to calls and project activities such as project start, midterm evaluation and review of results.

The conferences can be carried out in collaboration with partners that are accustomed to utilization and to conferences. One example is The Swedish Royal Academy of Engineering Sciences and the initiative Research2Business.

Experiences from previous SSF conferences can be drawn on, for instance, conferences of the SSF utilization Award.

One option to consider for conferences is to slightly remould the SSF utilization Award, turning it into an SSF Impact Award with the award ceremony at the conferences. The SSF utilization Award has been handed out several times, but a focus on impact has additional potential since this is where the performance of utilization really lies, rather than on utilization *per se*. Further, it is an opportunity for SSF to learn more about the impact emanating from their projects which can be a fundament for future strategies on utilization and impact.

Initiatives following this recommendation can potentially be brought up with other funding organisations in activities suggested in R4.

9. Conclusions

First, a set of general conclusions can be drawn from the survey data:

• Most of the respondents are satisfied with the purpose of the utilization grant, i.e., to contribute to the development of Sweden´s competitiveness.

• Most of the respondents think that 3% is enough and meets their needs.

• Most respondents are positive and believe that the funding has stimulated them to become involved in utilization.

Second, there are more specific conclusions drawn from the investigation questions Q1-Q4. These are analysed below.

9.1. Q1 Does SSF's utilization fulfil the foundation statutes' requirements for "development of Sweden's future competitiveness"?

To analyse Q1, the following definition of Sweden's future competitiveness is taken from the SSF Research Strategy 2021-2026:

1. SSF's definition of long-term competitiveness is based on the impact which 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.

2. The competitiveness is evaluated based on how well Swedish research and postgraduate training score in international comparison, and how these contribute to industry increasing their market shares or lead to a more efficient society.

3. 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.

As explained in Chapter 4, the study's objectives are linked to the first point. At the same time methodological restrictions make it difficult to study societal impact outside of academia (this is further elaborated in Chapter 5).

To make a stringent analysis of the investigation's data in relation to Q1, an Impact Logic is introduced. As seen in Figure 1 the Impact Logic consists of activities, output, outcome, and impact.

Activities - The activities that lead towards the desired impact.

↓

Output - The direct output of activities.

↓

Outcome - The changes needed to reach impact.

↓

Impact - The desired changes for the target group or society.

Figure 4. An Impact Logic of utilization activities, output, outcome, and impact. Source: Guide for measuring impact in an innovation project, Sweden's Innovation Agency Vinnova (2022).

The Impact Logic should be read as follows: Activities lead to Output that leads to Outcome that in turn leads to Impact. The analysis focuses on Output and Outcome (and excludes Impact).

9.1.1. The utilization results of SSF projects – survey question #11

Question 11 of the survey, see Appendices 10.2 and 10.3, describes the results of the utilization of SSF projects:

11. Below are a number of statements about how your utilization results have developed further after the project was finished. Please indicate to what extent you agree with each statement. The utilization results have...

	Not at all	To some extent	To a great extent
...intensified collaboration with external Swedish industrial partners (incl. hospitals)	❍	❍	❍
...intensified collaboration with external international industrial partners (incl. hospitals)	❍	❍	❍
...created new commercial projects	❍	❍	❍
...resulted in licensing/sale of patent	❍	❍	❍
...created new products/services	❍	❍	❍
...created new research questions	❍	❍	❍
...created business growth, for instance in start-ups	❍	❍	❍
...resulted in other social benefits	❍	❍	❍

The answers are shown in Figure 5:

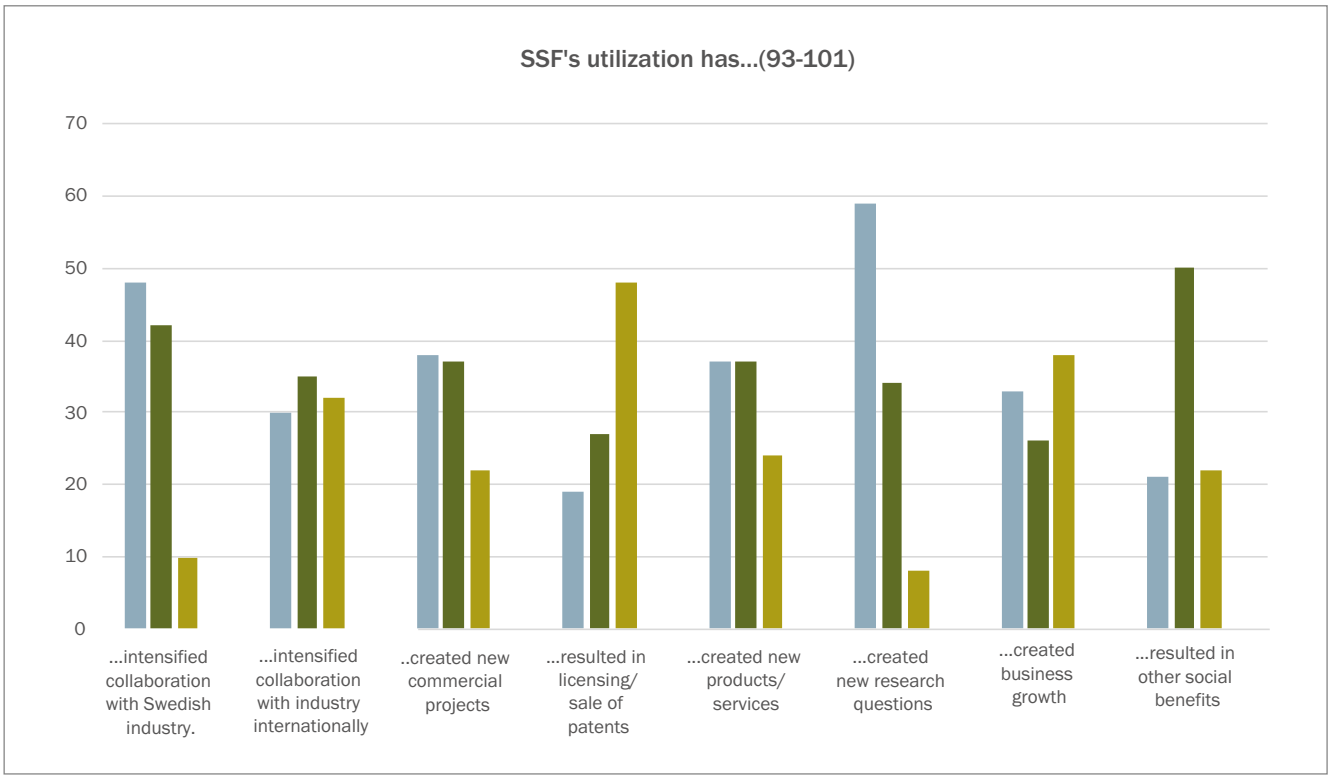


Figure 5. Above are statements about how your utilization results have develo ped further after the project was finished. Please indicate to what extent you agree with each statement. The utilization results have...[15]

15. In all tables, the number of respondents is given in brackets after the heading.

The categories in Figure 5 that are defined as Outcome according to the Impact Logic are interesting since they are indicating SSF's researchers' contributions to global innovation and thereby to Sweden's long-term competitiveness:

• Created new commercial projects.

• Resulted in licensing/sale of patent.

• Created new products/services.

• Created business growth.

Notably, Figure 5 shows that the collaboration with Swedish industry is intensified. From that we deduce that the industry collaboration capacity of researchers has increased. This should be regarded as an important Outcome.

Table 1 below shows the number of respondents and the share of respondents for each category.

	To a great extent		To some extent		Not at all	
	No. of respondents	Share of respondents (%)	No. of respondents	Share of respondents (%)	No. of respondents	Share of respondents (%)
created new commercial projects	*38*	*39%*	*37*	*38%*	*22*	*23%*
resulted in licensing/ sale of patent	*19*	*20%*	*27*	*29%*	*48*	*51%*
created new products/services	*37*	*38%*	*37*	*38%*	*23*	*24%*
created business growth	*33*	*35%*	*26*	*28%*	*38*	*40%*

Table 1. The number of respondents and the share of respondents indicating Outcome according to the Impact Logic.

Table 1 shows that the majority of respondents indicate that the projects have to a great extent or to some extent contributed to the Outcome categories. The strongest contributions are made to the categories "created new commercial projects" and "created new products/services". It should be noted that the data in Table 1 have not been checked with other data sources.

Then, we can only conclude that the respondents are of the opinion that the projects yield an Outcome with the potential of contributing to Sweden's competitiveness. A different study is needed to draw clearer conclusions.

9.1.2. The differences in Output and Outcome between projects with and without the utilization grant

The results from final project reports and project applications for utilization during 2009-2021 is described in Appendix 12.1. These results include patents, which relate to the output part of the Impact Logic, and startups relate to the outcome part of the Impact Logic. The results are shown in Table 2 below.

Output - The direct output of activities	• 242 patents were filed and approved in the 141 projects that used the utilization grant, equalling 1.72 patents per project (aggregate from the final reports). • 24 patents were filed and approved in the 25 projects that did not use the utilization grant, equalling 0.96 patents per project (aggregate from the final reports).
Outcome - The changes needed to reach impact	• 58 startup companies were established in the 141 projects that used the utilization grant, equalling 0.41 startup companies per project (aggregate from the final reports). • 2 startup companies were established in the 25 projects that did not use the utilization grant, equalling 0.08 startup companies per project (aggregate from the final reports).

Table 2. Output and Outcome of SSF projects.

Table 2 shows that projects with the utilization grant had higher output (in terms of patents), and higher outcome (in terms of startups) compared with projects without the utilization grant. There are many different reasons for this[16] and it is not easy to draw any conclusions on the specific role played by the utilization grant.

What can be noted is that the projects using the utilization grant had filed significantly more patents and established many more startup companies. This supports the respondents' view in Table 1 that most of the projects contribute to generating Output as well as Outcome.

In general terms it seems likely that the availability of the utilization grant may attract researchers with a drive to utilize their research results as well as supporting the utilization of projects.

Therefore, we conclude that the availability of the utilization grant significantly increases the innovation Output and Outcome SSF projects. The utilization grant, and the overall intent of SSF to utilize research results to develop Sweden's competitiveness, are important features of SSF's business and brand.

There are also effects after the SSF projects are finished. In the survey, respondents were asked "Have you utilized research results after the project finished (without SSF's utilization funding)?". 79 respondents answered "yes" and 21 answered "no" (see Figure 6 below).

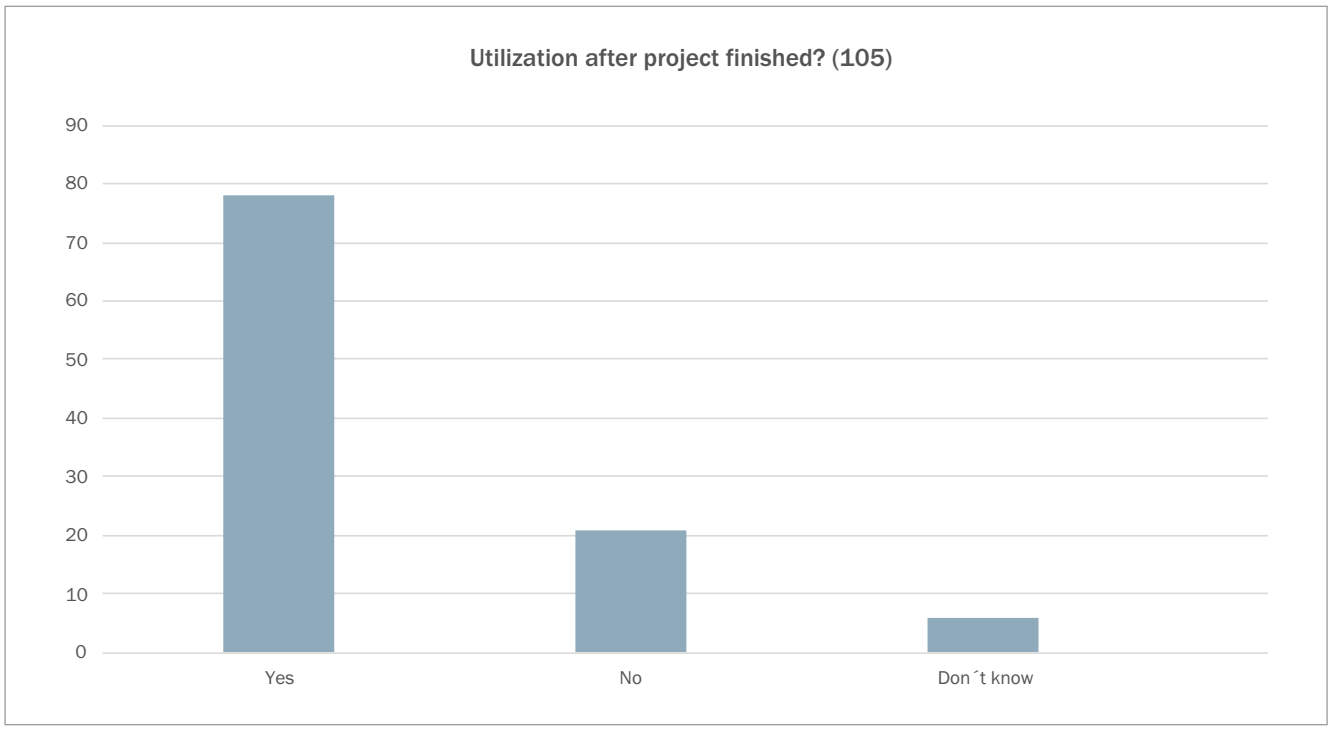


Figure 6. Have you utilized research results after the project finished (without SSF's utilization funding)?

Figure 6 shows that a clear majority (75%) of respondents utilized research results after the project finished while a minor share (20%) did not. In this sense, SSF projects also contributed to follow-on utilization, and consequently to impact and to Sweden's competitiveness.

***Conclusion C1.1** SSF's utilization grant significantly increases the utilization in SSF projects. The utilization grant also contributes to follow-on utilization in other projects by strengthening researchers' mindset towards utilization as well as their capacity for industry collaboration.*

16. See Table 40, appendix 10.2 for more details on the reasons for not applying for the utilization grant including that the project focused mainly on basic research and that other utilization funds were used instead.

9.2. Q2: Does SSF's utilization meet the researchers' needs and does it stimulate them to become further involved in utilization?

This question has two parts, one focusing on the researchers' needs and one focusing on if and how researchers are stimulated to become further involved in utilization.

9.2.1 The researchers' needs

The researchers' needs are covered by the following questions and tables in the survey.

Size of funding

Figure 7 below shows whether the respondents considered that utilization efforts had been correctly funded. The question asked was "Is 3% of the grant reserved for utilization about right?". 82 respondents believed a utilization grant of 3% was about right and 9 respondents believed it was too small.

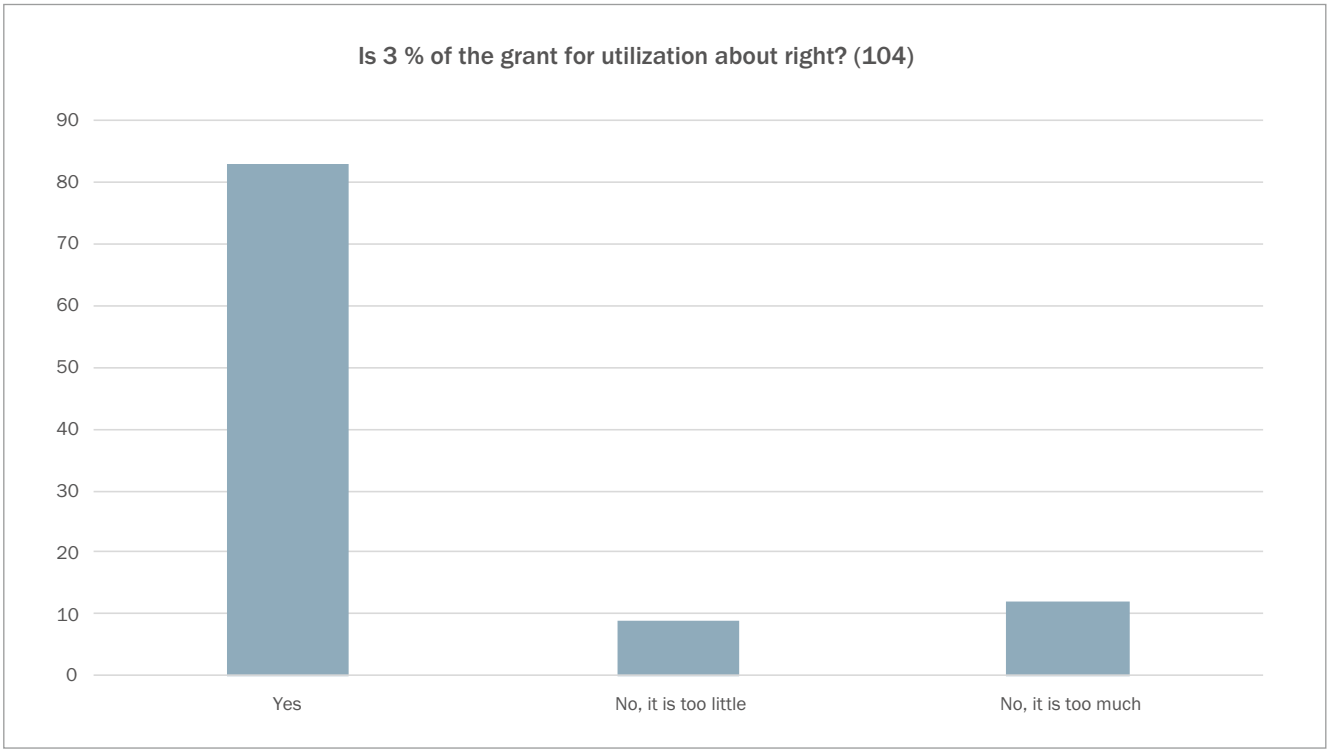


Figure 7. Is 3% of the grant reserved for utilization about right?

> ***Conclusion C2.1:*** *The needs are met for the majority of researchers with regard to the size of the funding. However, the cases where the utilization grant was perceived to be too small might include cases that still require high-risk downstream research and market entry, but which have great potential for utilization and impact. Therefore, it is important to consider these cases carefully (along the lines of R2, and also along the lines of the interviews and Statements S1, S2, S3, S8 and S12).*

Complementarity of the utilization grant and other sources of funding

Figure 8 shows that more than 60 respondents say that the utilization grant complements other funding and almost 30 say that the grant is unique.

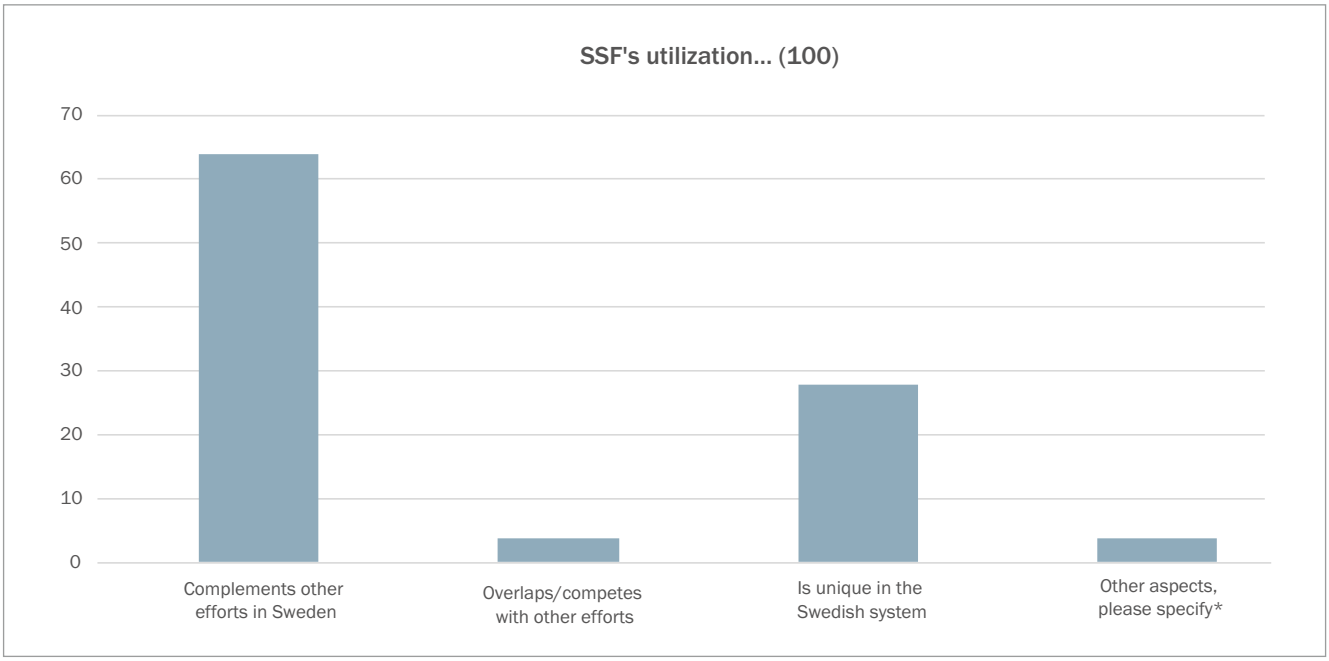


Figure 8. Which statement do you agree with most.

***Conclusion C2.2:** The researchers' needs are met to a significant extent with regard to the complementarity of the SSF utilization grant and other sources of funding.*

The utilization grant as a catalyst that enables utilization.

Figure 9 shows to what extent the respondents believe that utilization would have occurred without SSF's utilization funding. It shows that around 17 respondents would have opted for the same utilization efforts also without the utilization grant, and that just over 60 respondents would have done so to some extent. However, it can be noted that only 17 respondents would

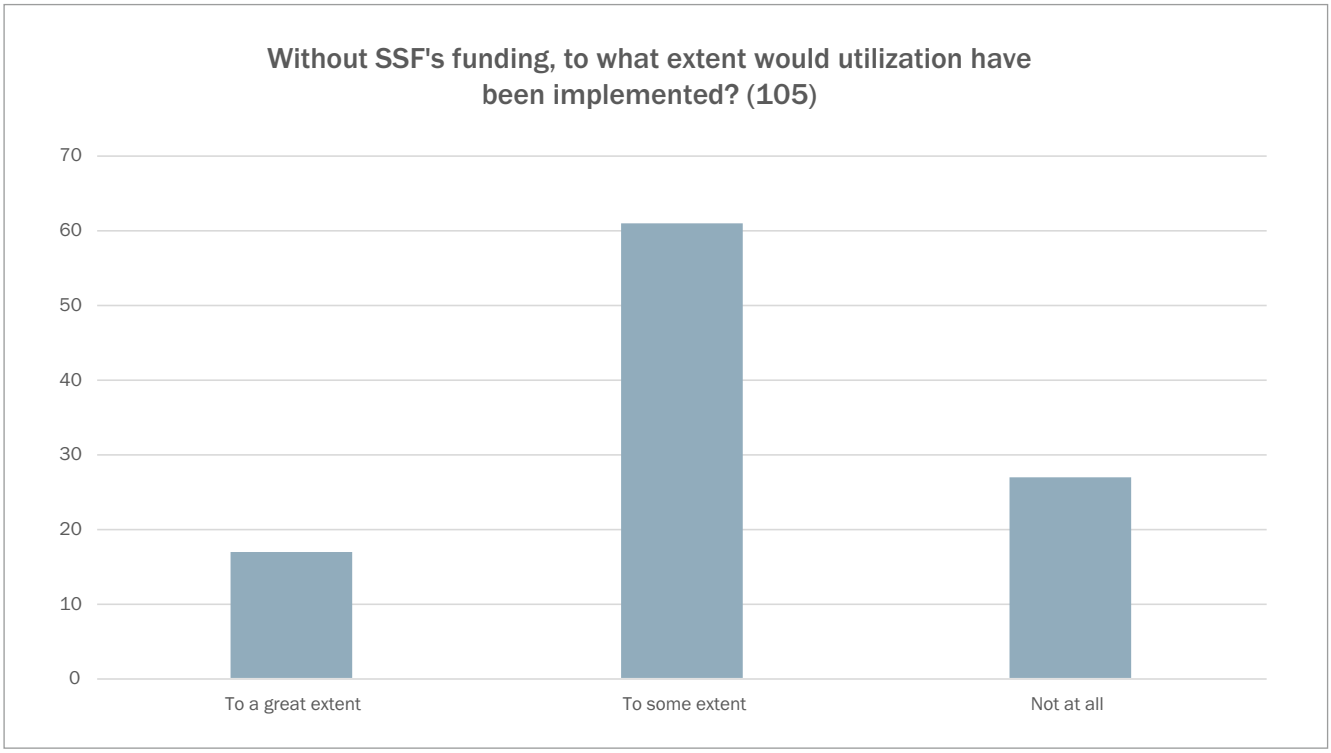


Figure 9. To what extent would your utilization project have been realized without SSF's utilization funding?

have opted for similar utilization efforts and that around 25 respondents would not have engaged in utilization efforts at all. Hence, the utilization grant played a significant role for the clear majority of respondents.

Conclusion C2.3: *The number and share of respondents that would have opted for similar utilization efforts are quite small, which indicates that the utilization grant is largely attuned to the needs of the researchers and that the utilization grant acts as a catalyst that enables utilization.*

Information provided about utilization

Figure 10 shows the respondents' wish to receive more information about utilization during the project period. 73 respondents (of 104) had no need to receive more information, however, 23 respondents did need more information, showing some improvement potential. It is at this point unclear which types of projects or what type of information would be desired by these respondents.

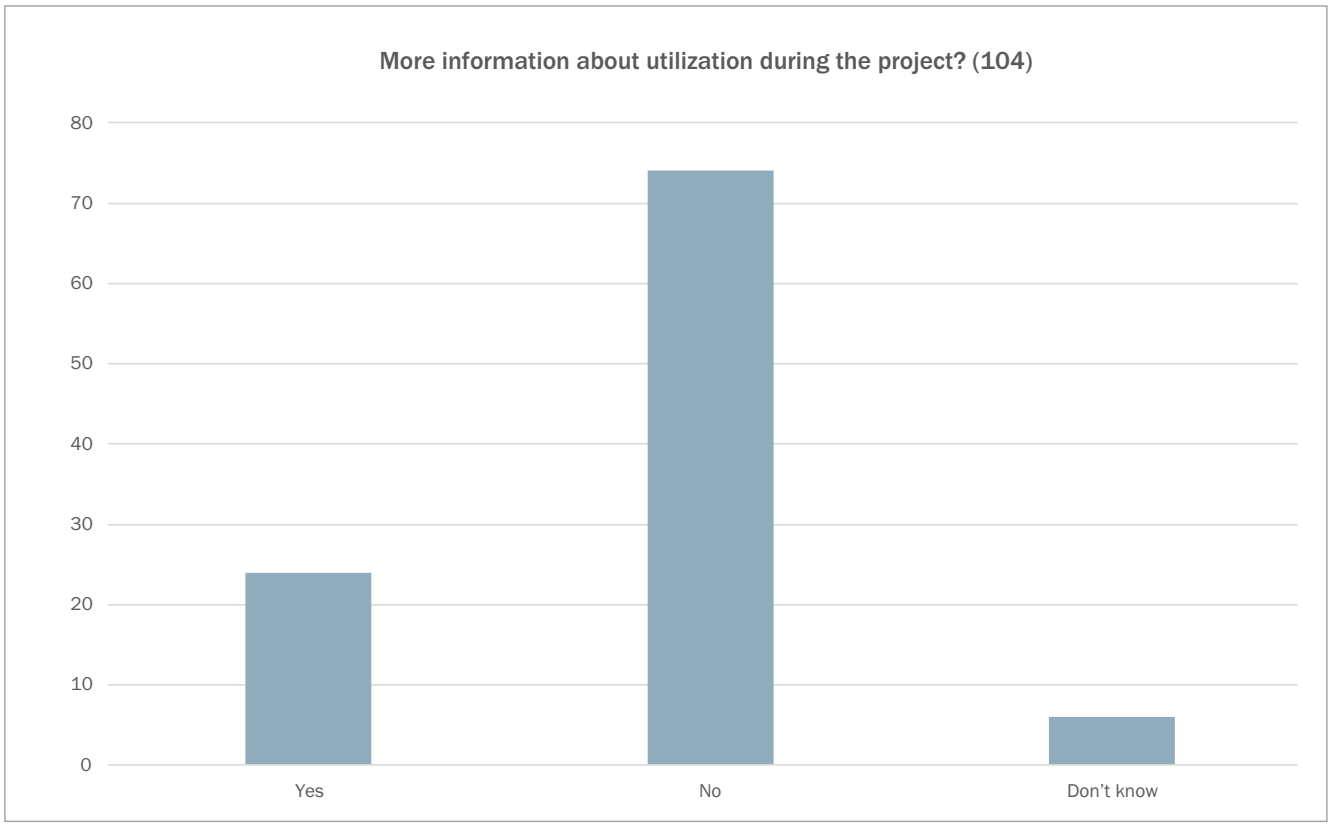


Figure 10. Would you have liked SSF to provide more information about utilization during the project?

Conclusion C2.4: The information given to researchers about the utilization grant during the project can be improved.

The number and share of respondents that are satisfied with the information suggest that SSF's approach is about right, and that the needs of the majority of researchers are met. However, the number and share of respondents that need more information indicate that there is potential for improvement. Therefore, it is recommended that SSF staff is given the task to investigate how this potential can be reached. The task should involve the roles of SSF's Programme Committee and SSF's Scientific Secretary. Another opportunity is to shape the utilization arenas of R5 to provide further information (e.g. along the lines of the interviews and Statements S3, S5, S7, S10 and S12).

Ease/difficulty in applying for the utilization grant

Figure 11 shows how easy/difficult the respondents found the application process for utilization funding. 62 respondents found it easy, 31 respondents found it neither easy nor difficult, and 9 respondents found it difficult.

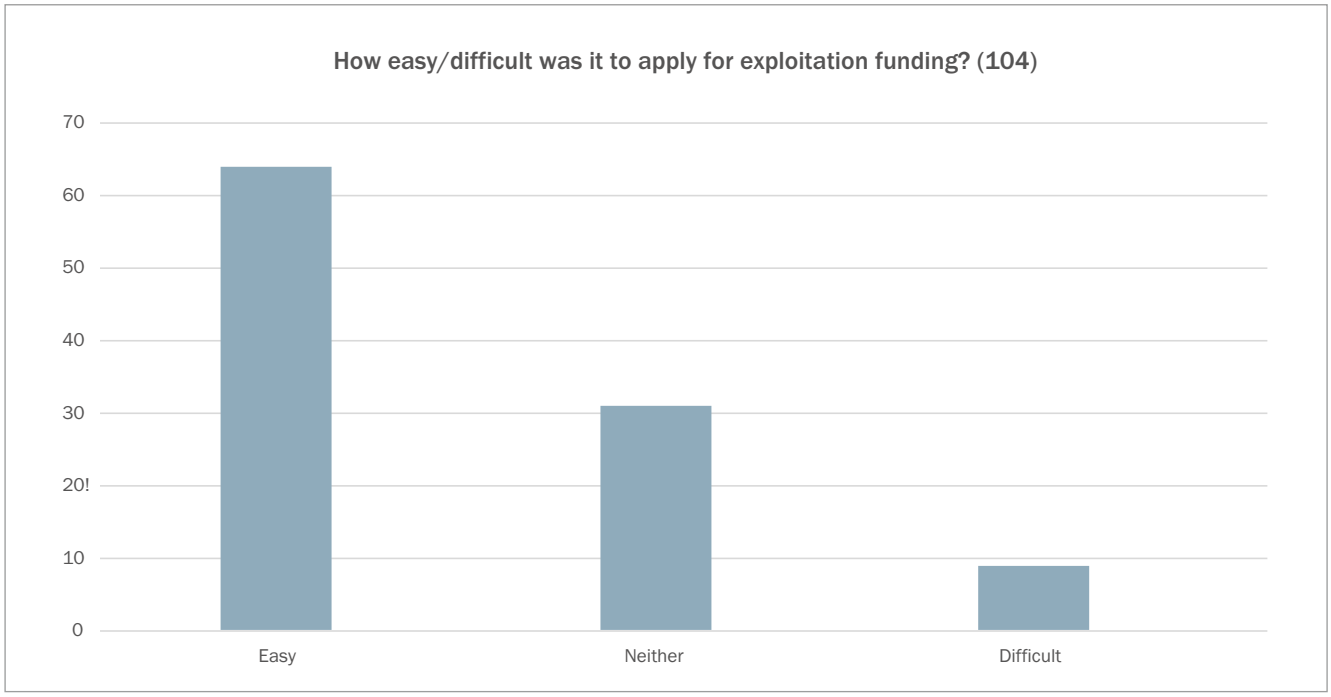


Figure 11. How easy/difficult was it to apply for utilization funding?

> ***Conclusion C2.5:*** *As many found it easy to apply for utilization funding and a few found it difficult, the needs of the researchers are largely met.*

Summary

To summarise, the following conclusions are drawn regarding Q2 and if and how the researchers' needs are met:

> ***Conclusion C2.1:*** *The needs are met for the majority of researchers with regard to the size of the funding. However, projects where the utilization grant was perceived to be too small might include cases which have great potential for utilization and impact. Therefore, it is important to consider these cases carefully (along the lines of R2, and also along the lines of the interviews and Statements S1, S2, S3, S8 and S12).*
>
> ***Conclusion C2.2:*** *The researchers' needs are met to a significant extent with regard to the complementarity of the SSF utilization grant and other sources of funding.*
>
> ***Conclusion C2.3:*** *The number and share of respondents that would have opted for similar utilization efforts are quite small, which indicates that the utilization grant is largely attuned to the needs of the researchers and that the utilization grant acts as a catalyst that enables utilization.*
>
> ***Conclusion C2.4:*** *The information given to researchers about the utilization grant during the project can be improved.*
>
> ***Conclusion C2.5:*** *As many found it easy to apply for utilization funding and a few found it difficult, the needs of the researchers are largely met.*

9.2.2. Does SSF's utilization stimulate researchers to become further involved in utilization?

How SSF's utilization stimulates researchers to become further involved in utilization is covered by the survey where respondents were asked "To what extent has SSF's utilization stimulated you to engage in utilization (more than you would have done otherwise)?". 59 respondents answered "To a great extent", 42 answered "To some extent", 4 answered "Not at all". See more details in Figure 12 below.

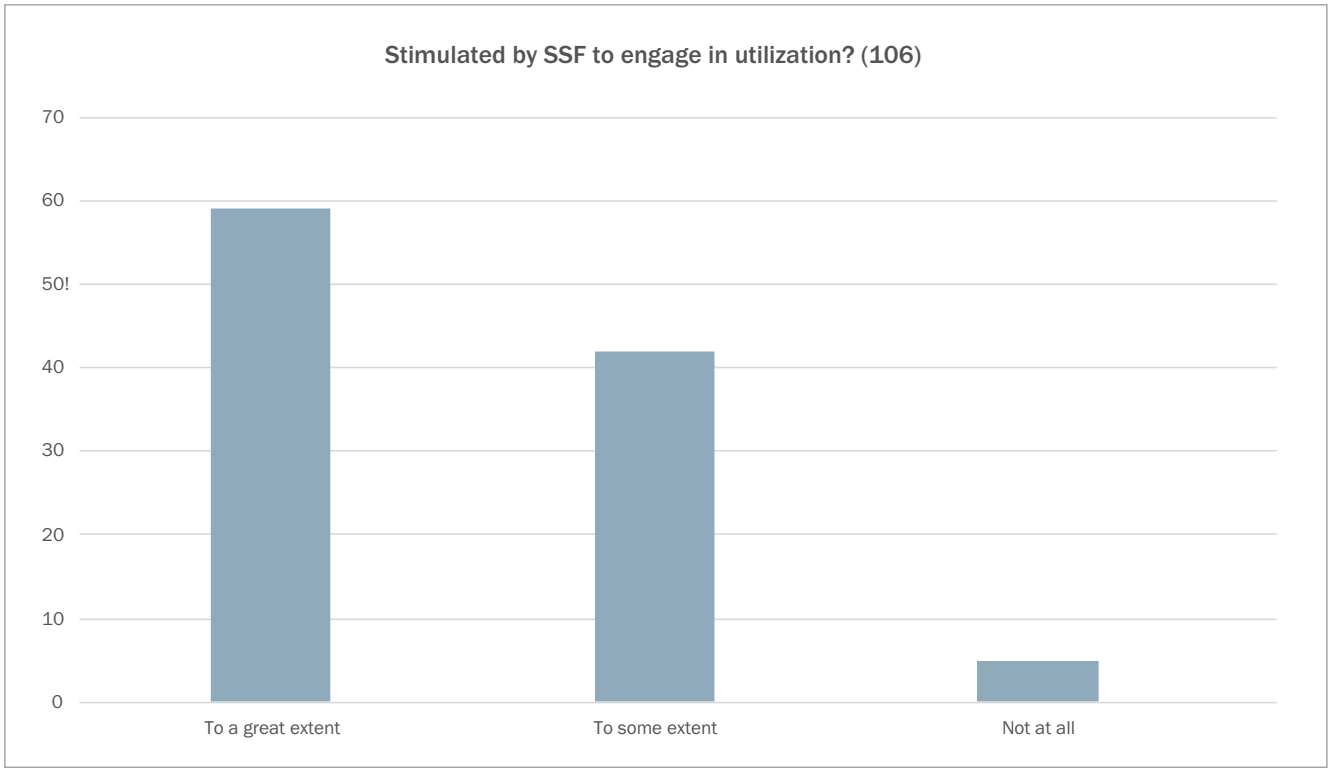


Figure 12. To what extent has SSF's utilization stimulated you to engage in utilization (more than you would have done otherwise)?

A large share of the respondents (57%) were stimulated to a great extent, and almost all respondents were stimulated to a great extent or to some extent (95%). Therefore, it can be concluded that SSF's utilization significantly stimulates researchers to engage in utilization.

Researchers are stimulated to engage in utilization, presumably not only in the current SSF project but also in other projects. Interview data show that the engagement can be long-lasting. Therefore, this can be an important effect.

> ***Conclusion C2.6: SSF's utilization significantly stimulates researchers to engage in utilization. Utilization arenas along the lines of R5 (e.g. along the lines of the interviews and Statements S3, S5, S7, S10 and S12) can be designed to increase the stimulation and experience sharing even further.***

9.3. Q3: Utilizing or not utilizing - what are the major deciding factors?

The survey asked respondents to rank the most decisive factors for utilization. The question asked was: "What factors were decisive for the utilization of research results within the SSF project (you may choose several options, entering 1 for the most important, 2 for the second most important, and so on)?

The answers are shown in Figure 13-16 below where Figure 13 shows the factors ranked as most important, Figure 14 shows the factors ranked as the second most important, Figure 15 shows the factors ranked as the third most important, and Figure 16 shows factors ranked lower than three.

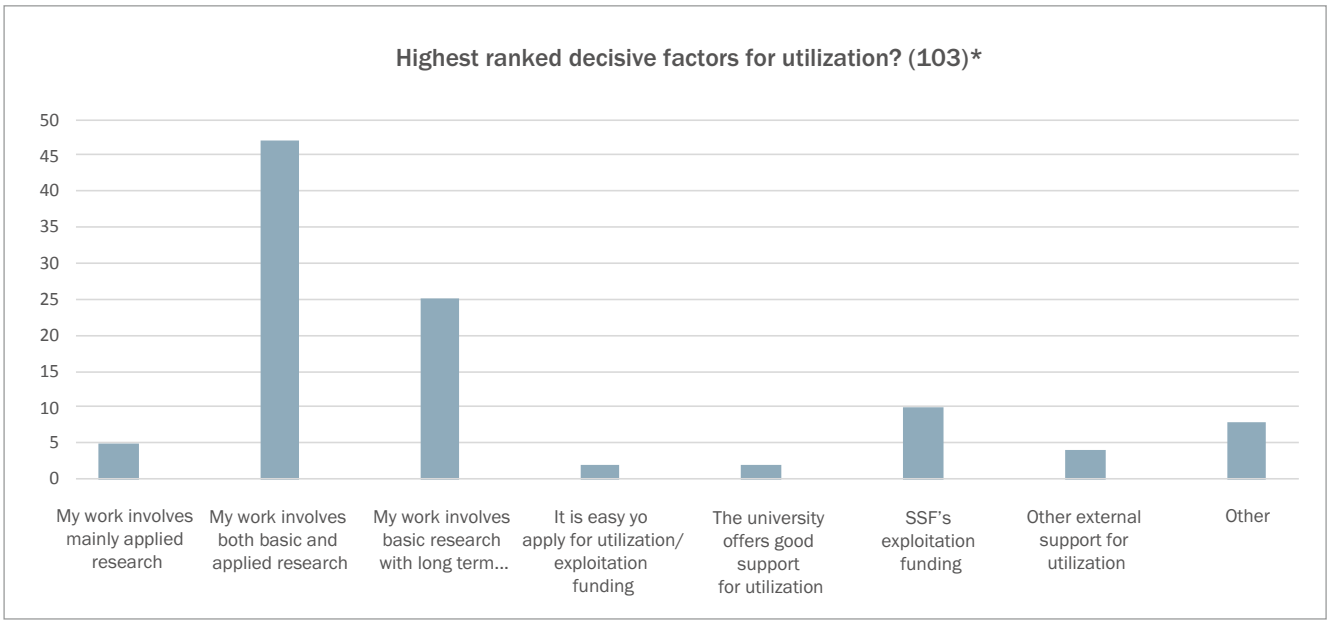


Figure 13. Number of answers for the most decisive factors.

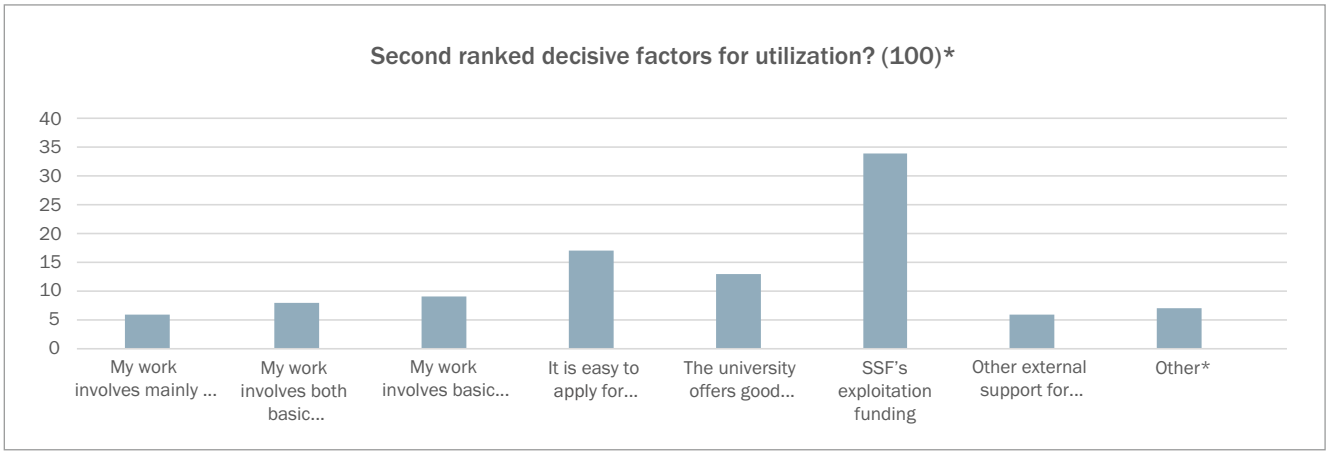


Figure 14. Number of answers for the second most decisive factors.

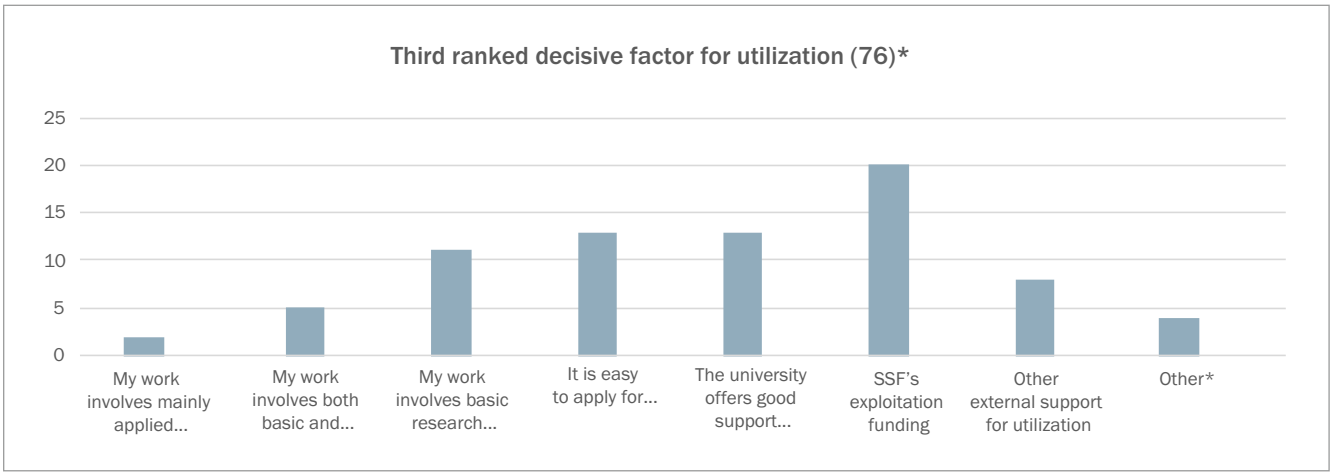


Figure 15. Number of answers for the third most decisive factors

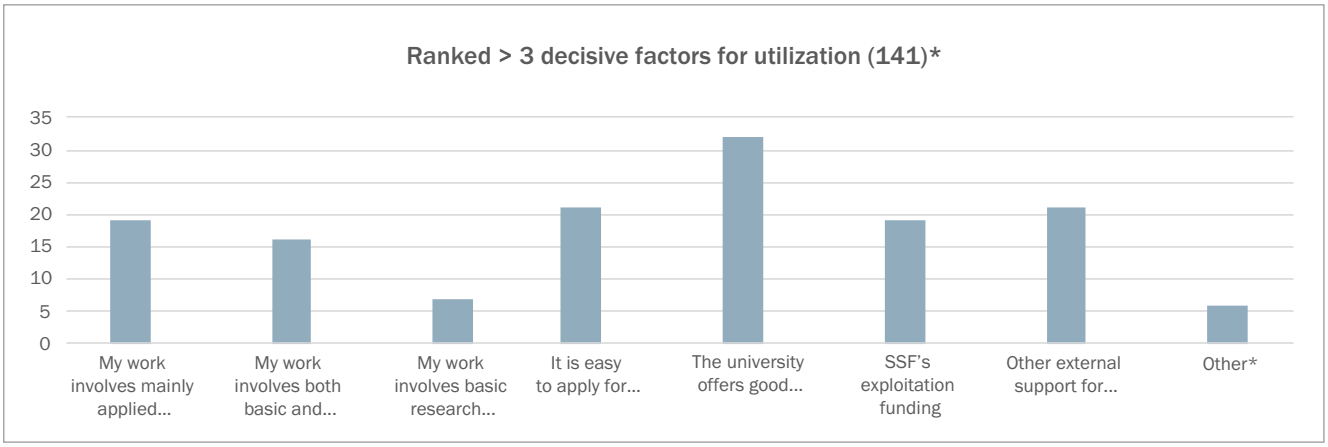


Figure 16. Number of answers for factors ranked lower than three.

9.3.1. Analysis of factor rankings

Definition of factors' weighted strength overall

The survey allows each respondent to input his or her personal factor ranking, and to assign the most important factor, the second most important factor and so on. This gives rise to some methodological considerations.

Respondents' input can be seen to define four factor categories: Most important factor, Second most important factor, Third most important factor, and Factors ranked lower than three.

A methodological problem occurs if you want to draw conclusions by combining results from the different categories. For instance, it is difficult to say if the 4th strongest factor in the Most important factor category is more decisive than the 2nd strongest factor in the Second most important factor category.

To remedy this, it is necessary to get a view of the overall strength of each factor while considering its total strength in all factor categories.

Therefore, weights are assigned factor categories according to Table 3.

Factor category	Weight
Most important factor	1
Second most important factor	0.5
Third most important factor	0.33
Factors ranked lower than three	0.2

Table 3. Weights of factor categories

The strength of a factor in a particular category is defined as the number of respondents that assigns it.

The factor strength is then multiplied with the weight of each category to derive the factor's weighted strength per category.

The factor's weighted strength per category is then summarised for all categories to derive the weighted strength overall.

An example is provided in Table 4 where a fictive factor is assigned as the most important factor by 10 respondents, the second most important factor by 10 respondents, the third most important by 12 respondents, and as a factor ranked lower than three by 5 respondents.

Factor category	Weight	Strength per category (# respondents)	Weighted strength per category
Most important factor	1	10	10
Second most important factor	0.5	10	5
Third most important factor	0.33	12	4
Factors ranked lower than three	0.2	5	1
Weighted strength overall			20

Table 4. The weighted strength overall of a fictive factor.

As can be seen in Table 5 the weighted strength of the fictive factor is 20.

The weighted strength overall of each factor allows us to compare factors with regards to their strength in all categories.

Deriving factors' weighted strength overall

The weighted strength per category for the six strongest factors in each category are now derived according to Tables 5-8 below.

Factor	Strength per category (# respondents)	Weight	Weighted strength
My work involves both basic and applied research	47	1	47
My work involves basic research with long term potential for utilization	25	1	25
SSF's utilization funding	10	1	10
My work involves mainly applied research	5	1	5
Other external support for utilization	4	1	4
It is easy to apply for utilization/ utilization funding	2	1	2
The university offers good support for utilization	2	1	2

Table 5. The factors' weighted strength in the category Most important factor.

Factor	Strength per category (# respondents)	Weight	Weighted strength
SSF's utilization funding	34	0.5	17
It is easy to apply for utilization/utilization funding	16	0.5	8
The university offers good support for utilization	13	0.5	6.5
My work involves basic research with long term potential for utilization	9	0.5	4.5
My work involves both basic and applied research	7	0.5	3.5
My work involves mainly applied research	6	0.5	3

Table 6. The factors' weighted strength in the category Second most important factor.

Factor	Strength per category (# respondents)	Weight	Weighted strength
SSF's utilization funding	20	0.33	6.6
It is easy to apply for utilization/ utilization funding	12	0.33	4.0
The university offers good support for utilization	12	0.33	4.0
My work involves basic research with long term potential for utilization	11	0.33	3.6
Other external support for utilization	7	0.33	2.3
My work involves both basic and applied research	5	0.33	1.7

Table 7. The factors' weighted strength in the category Third most important factor.

Factor	Strength per category (# respondents)	Weight	Weighted strength
The university offers good support for utilization	32	0.2	6.4
It is easy to apply for utilization/ utilization funding	21	0.2	4.2
Other external support for utilization	21	0.2	4.2
SSF's utilization funding	19	0.2	3.8
My work involves mainly applied research	19	0.2	3.8
My work involves both basic and applied research	16	0.2	3.2

Table 8. The factors' weighted strength in the category Factors ranked lower than three.

Deriving the degree of decisiveness overall and the most decisive factors overall

The weighted strength for all factors in all categories are now summarized to derive the factors' weighted strength overall (Table 9) and their degree of decisiveness overall is divided into four categories – from the Most decisive factor, with a superior weighted strength overall (52) , the Second most decisive factors (of fairly similar strength 33-37), the Third most decisive factors (of fairly similar strength 17-18), and the Fourth most decisive factors (of fairly similar strength 11-12).

Factor	Weighted strength overall	Degree of decisiveness overall
My work involves both basic and applied research	52	Most decisive factor overall (ranking is not close to any of the other factors)
SSF's utilization funding	37	Among the Second most decisive factors overall (ranking is close to 33)
My work involves basic research with long term potential for utilization	33	Among the Second most decisive factors overall (ranking is close to 37)
It is easy to apply for utilization/utilization funding	18	Among the Third most decisive factors overall (ranking is close to 17)
The university offers good support for utilization	17	Among the Third most decisive factors overall (ranking is close to 18)
My work involves mainly applied research	12	Among the Fourth most decisive factors (ranking is close to 11)
Other external support for utilization	11	Among the Fourth most decisive factors (ranking is close to 12)

Table 9. Factors' weighted strength overall and their degree of decisiveness overall.

Results and conclusions

The ranking of factors according to the degree of decisiveness overall yields the following results and conclusions.

Result	Conclusion
The main decisive factor for utilization is that the work involves both basic and applied research.	SSF should ensure that researchers whose work involves both basic and applied research apply for SSF funding. This is done by further clarifying that SSF targets these researchers.
The availability of SSF utilization funding is among the second most decisive factors. This is supported by S7, S8 and S12 from the interviews.	The utilization grant is an important factor and should be a component of the future SSF approach to stimulate utilization.
The work being inclusive of basic research with long-term potential for utilization is among the second most decisive factors.	SSF should ensure that researchers whose work involves basic research with a long-term potential for utilization apply for SSF funding. This is done by further clarifying that SSF targets these researchers.
The university offering good support for utilization is among the third most decisive factors. This is supported by S5 and S6 from the interviews.	R1 (that university support functions are aware of ongoing application work) is supported by this factor. The quality of the universities' utilization support can be addressed through R4 (Systematic dialogue with other funding organizations) and R5 (Continuous utilization meeting arenas).
The ease of application for utilization is among the third most decisive factors. This has been found also in the interviews even if it has not been an explicit topic.	The future application procedure should be developed from the point of view that it should be easy to apply for utilization.
The work involving mainly applied research and other external support for utilization being available are the fourth most decisive factors	No specific conclusions for SSF are derived.

9.3.2. Summary

The analysis shows that the following factors are the most decisive for utilization:

• The work involving both basic and applied research is the main decisive factor for utilization.

• The availability of SSF utilization funding is among the second most decisive factors. This is supported by S7, S8 and S12 from the interviews.

• The work being inclusive of basic research with long-term potential for utilization is among the second most decisive factors.

• The university offering good support for utilization is among the third most decisive factors. This is supported by S5 and S6 from the interviews.[17]

• The ease of application for utilization is among the third most decisive factors. This has been found also in the interviews even if it has not been an explicit topic.

• The work involving mainly applied research and other external support for utilization being available are the fourth most decisive factors.

17. This supports R1 and greater involvement from university support functions during the application phase. The quality of the universities' utilization support is a topic to include in R4, Systematic dialogue with other funding organisations, and R5, Continuous utilization meeting arenas.

From these factors, the following conclusions are derived:

Conclusion C3.1: SSF should continue to ensure that researchers whose work involves both basic and applied research apply for SSF funding, as well as researchers whose work involves basic research with a long-term potential for utilization. This is done by further clarifying that SSF targets these researchers.

Conclusion C3.2: The availability of the utilization grant is in itself an important deciding factor for utilization and should as such continue to be a component of the future SSF approach to stimulate utilization.

Conclusion C3.3: Future application procedures should be developed from the point of view that it should be easy to apply for utilization.

9.4. Q4: What good examples are there in SSF's utilization and internationally?

From the international comparison with EIC and SPRIND in Chapter 7.2, we conclude the following:

Conclusion C4.1: Internationally, there are no funding organisations fully comparable to SSF. The closest funding schemes which have been analysed include EIC Transition at the European Commission and SPRIND in Germany.

Conclusion C4.2: The international comparison confirms that utilization grants are important for stimulating utilization. The comparison also shows that the relatively small size of the SSF utilization grant, the lack of follow-up funding, and limited direct support to researchers might limit the reach of SSF's approach.

9.5. Summary of conclusions

First, a set of general conclusions can be drawn from the investigation:

• Most of the respondents are satisfied with the purpose of the utilization grant, i.e., to contribute to the development of Sweden´s competitiveness.

• Most of the respondents think that 3% is enough and meets their needs.

• Most respondents are positive and believe that the funding has stimulated them to become involved in utilization.

The following conclusions have been drawn for Q1-Q4:

ERG also gives the following five recommendations:

R1 Stimulate stronger involvement from university support functions during the application phase.

R2 Increase the flexibility of size and usage of the utilization grant.

R3 Extend the time to apply for and use utilization grants after project completion.

R4 Engage more systematically in dialogue with other funding organisations with an interest in utilization.

R5 Arrange continuous meeting arenas about utilization.

Question	Conclusion
Q1: Does SSF's utilization fulfil the foundation statutes' requirements for "development of Sweden's future competitiveness"?	**C1.1:** SSF's utilization grant significantly increases the utilization in SSF projects. The utilization grant also contributes to follow-on utilization in other projects by strengthening researchers' mindset towards utilization as well as their capacity for industry collaboration.
Q2: Does SSF's utilization meet the researchers' needs and does it stimulate them to become further involved in utilization?	**C2.1:** The needs are met for the majority of researchers with regard to the size of the funding. However, projects where the utilization grant was perceived to be too small might include cases that require high-risk downstream research and market entry, but which have great potential for utilization and impact. **C2.2:** The researchers' needs are met to a significant extent with regard to the complementarity of the SSF utilization grant and other sources of funding. **C2.3:** The number and share of respondents that would have opted for similar utilization efforts are quite small, which indicates that the utilization grant is largely attuned to the needs of the researchers and that the utilization grant acts as a catalyst that enables utilization. **C2.4:** The information given to researchers about the utilization grant during the project can be improved. **C2.5** As many found it easy to apply for utilization funding and a few found it difficult, the needs of the researchers are largely met. **C2.6:** SSF's utilization significantly stimulates researchers to engage in utilization. Utilization arenas can be designed to increase the stimulation and experience sharing even further.
Q3: Utilizing or not utilizing – what are the major deciding factors?	**C3.1:** SSF should continue to ensure that researchers whose work involves both basic and applied research apply for SSF funding, as well as researchers whose work involves basic research with a long-term potential for utilization. This is done by further clarifying that SSF targets these researchers. **C3.2:** The availability of the utilization grant is in itself an important deciding factor for utilization and should as such continue to be a component of the future SSF approach to stimulate utilization. **C3.3:** Future application procedures should be developed from the point of view that it should be easy to apply for utilization.
Q4: What good examples are there in SSF's utilization and internationally?	**C4.1:** Internationally, there are no funding organisations fully comparable to SSF. The closest funding schemes which have been analysed include EIC Transition at the European Commission and SPRIND in Germany. **C4.2:** The international comparison confirms that utilization grants are important for stimulating utilization. The comparison also shows that the relatively small size of the SSF utilization grant, the lack of follow-up funding, and limited direct support to researchers might limit the reach of SSF's approach.

10. Appendices

10.1. Data from final reports and applications for utilization within projects 2009-2021[18]

Duration of this study: projects finalised between 2009-2021

Number of projects: 166
Of which female main PIs: 38 (23%)
Of which male main PIs: 128 (77%)

Total paid to projects including utilization from SSF: SEK 3,336 million

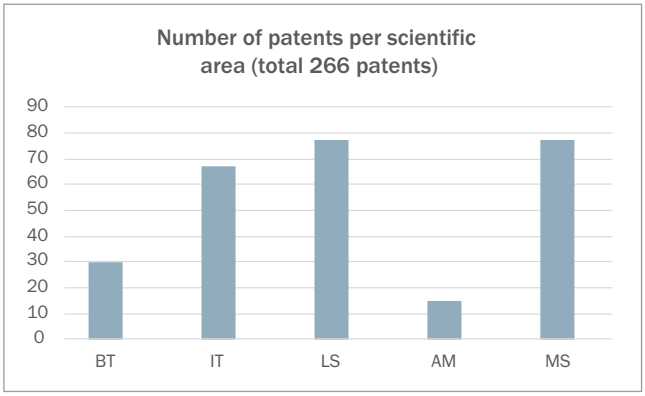
Total utilization fund from SSF: SEK 72.5 million
Of which "Proof of principle research projects": SEK 43.5 million
Of which "Commercialization potential projects": SEK 9.7 million
Of which "Patenting projects": SEK 17.0 million
Of which "Other": SEK 2.3 million

Total number of projects using utilization fund: 141

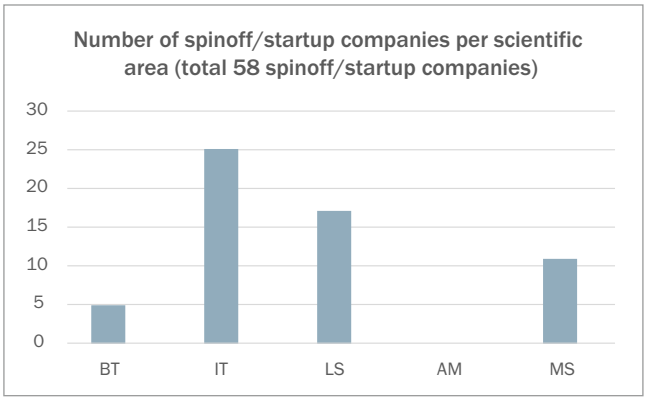
Number of projects not using utilization fund: 25

Total number of utilization projects (applied/approved): 424
Of which "Proof of principle research projects": 148
Of which "Commercialization potential projects": 93
Of which "Patenting projects": 171
Of which "Other": 12

Total number of patents: 266



Total number of spinoff/startup companies: 58



10.2. Results of Questionnaire answers

In January 2022, the questionnaire (Q) was sent to all main applicants of the 166 projects. 123 of them answered the Q. The Q is included in Appendix 11.3. The Q was organised in three sections.

Part A: All respondents. General data for everybody to answer

Part B: Respondents from projects that have benefitted from all or part of SSF's 3% utilization funding

Part C: Respondents from projects that have not benefitted from SSF's 3% utilization funding

Complementary comments to questions from respondents are shown in Appendix 10.4. The written comments in the Q were mainly positive comments and suggestions. However, these statements also included some criticism or proposals. Of 189 comments in total, 50 contained criticism/proposals. Respondents were invited to make written comments in questions 8, 9, 10, 12, 16, 19, 25, and 29. All comments are presented in Appendix 10.4.

10.2.1. Part A

A presentation of general data.
Figure 17 shows the distribution of respondents within different scientific fields. 44% of the respondents were active within the life sciences and 55% were active within the life sciences and/or biotechnology. In total, there were 123 respondents.

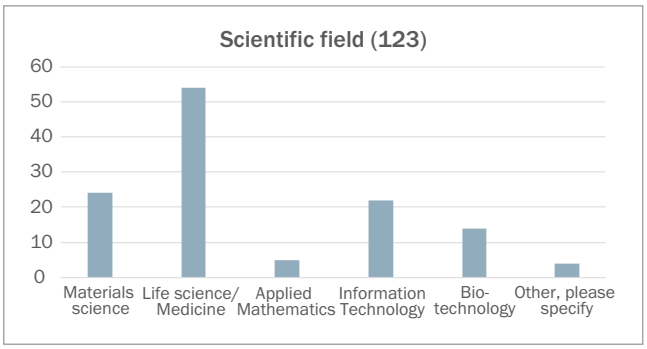


Figure 17

Figure 18 shows the distribution of respondents from different universities. 80% of the respondents were active within six major universities. Abbreviations for universities are found in Appendix 10.8.

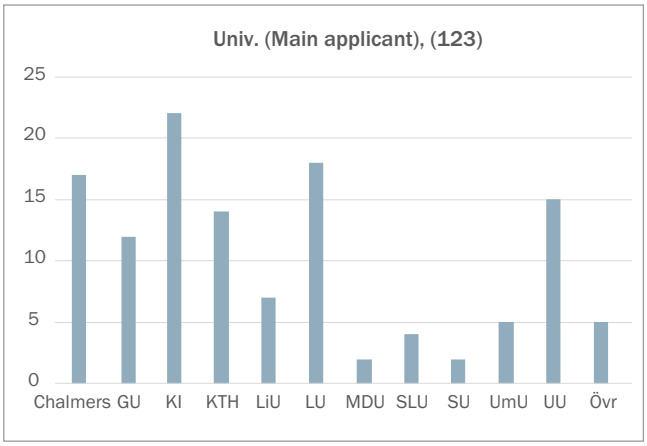


Figure 18

Figure 19 shows the distribution of the year of conclusion of projects. 52% of the respondents had concluded their projects during 2019-2021.

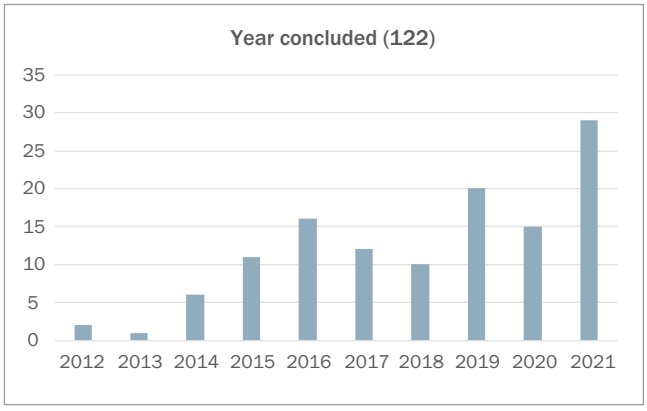


Figure 19

10.2.2. Part B.

This part contains data from respondents who have used SSF's utilization budget (the 3%).

Numbers in brackets after the heading indicate the number of respondents.

Figure 20 shows the respondents' opinions regarding to what extent work within utilization had had an impact on "the development of Sweden's future competitiveness". 81% of all respondents answered "Yes" and "Yes, to some extent". Respondents active within the life sciences and biotechnology account for 50% in these two categories.

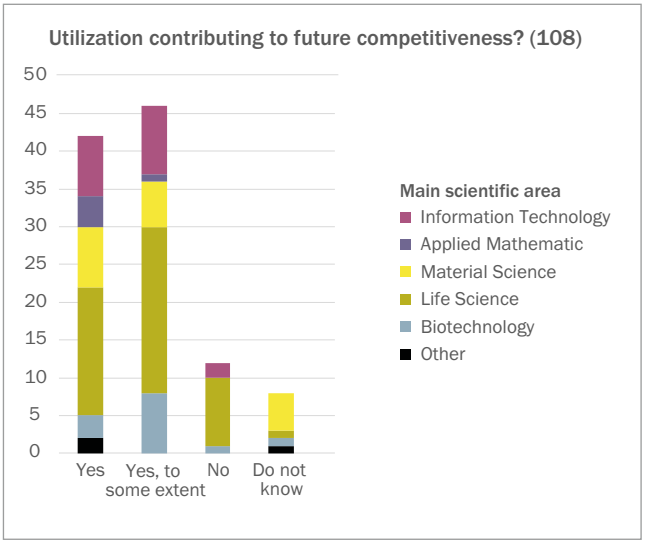


Figure 20. Has your work within utilization contributed to "the development of Sweden's future competitiveness"?[19]

Figure 21 shows the respondents' perception of the degree to which SSF's utilization had had an impact within society.

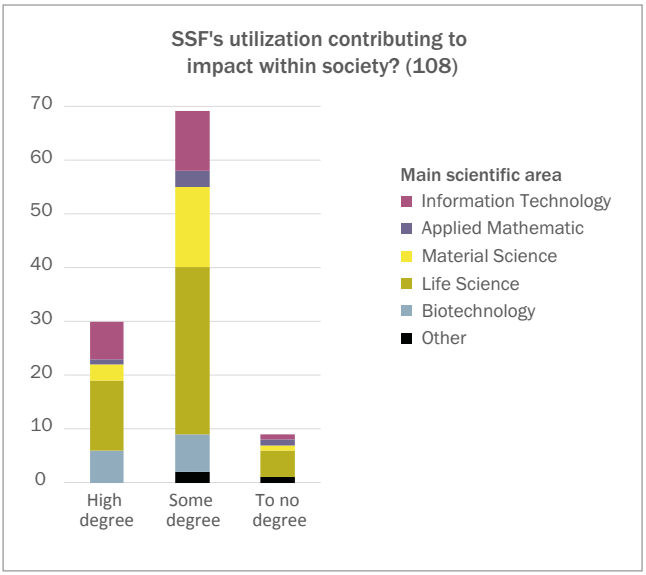


Figure 21. To what extent has SSF's utilization had an impact within society?

18. The he word exploitation and utilization are used synonymously by SSF and also in this report.
19. In all tables, the number of respondents is given in brackets after the heading.

56 % of the respondents thought that SSF's utilization to a great extent had stimulated them to engage in utilization. Adding respondents who felt that they had been stimulated "to some extent" brings the figure to 95%. See Figure 22.

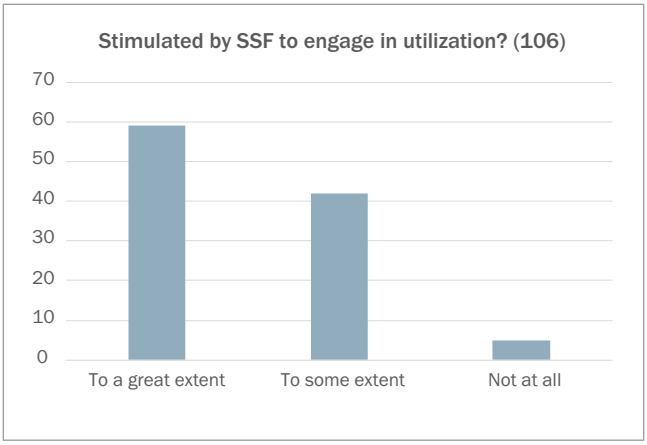


Figure 22. To what extent has SSF's utilization stimulated you to engage in utilization (more than you would have done otherwise)?

Figures 23-26 show the decisive factors for utilization.

Respondents were asked: What factors were decisive for the utilization of research results within the SSF project (you may choose several options, entering 1 for the most important, 2 for the second most important, and so on)?

Figure 23 shows the factors ranked as most important.

Figure 24 shows the factors ranked as the second most important.

Figure 25 shows the factors ranked as the third most important.

Figure 26 shows factors ranked lower than three (>3).

Respondents were also able to make comments. In total, 19 respondents made comments on this question – see Appendix 10.4.

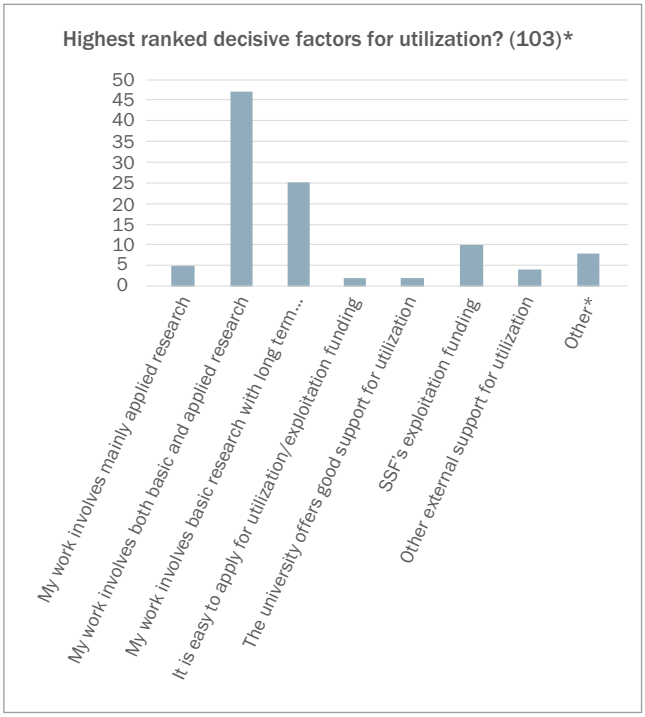


*Figure 23. * Number of answers as highest ranked*

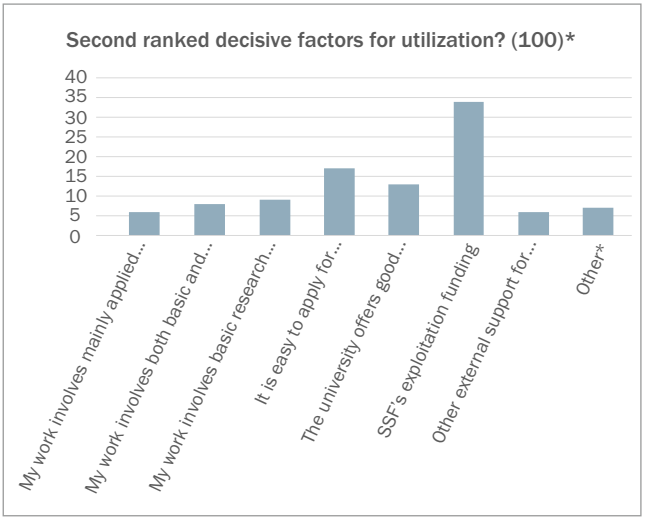


*Figure 24. * Number of answers as second ranked*

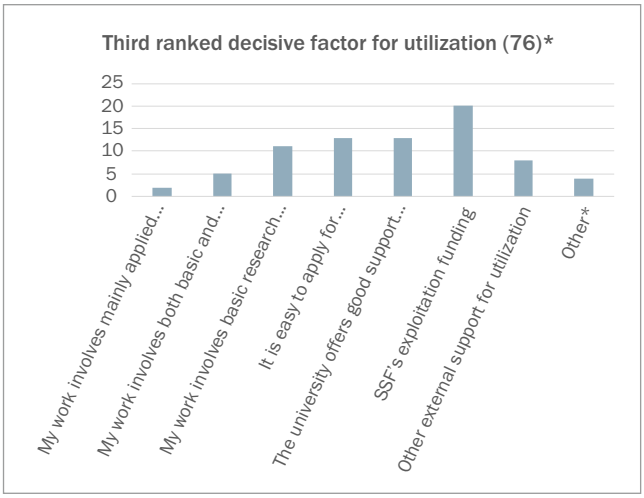


*Figure 25. * Number of answers as third ranked*

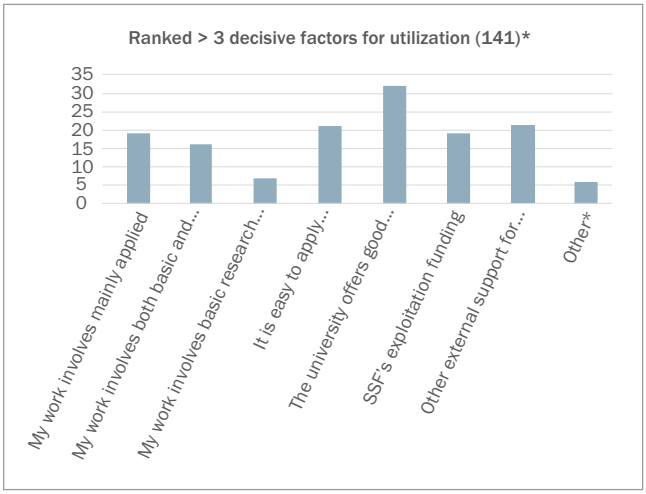


*Figure 26. * Number of answers as ranked >3*

Answers to the question “Any other national or international examples that you regard as good examples of utilization?” are presented in 10.3.

Figure 27 shows the respondents’ agreement with various statements regarding SSF’s utilization in the Swedish system. Other aspects in written comments are presented in 10.3.

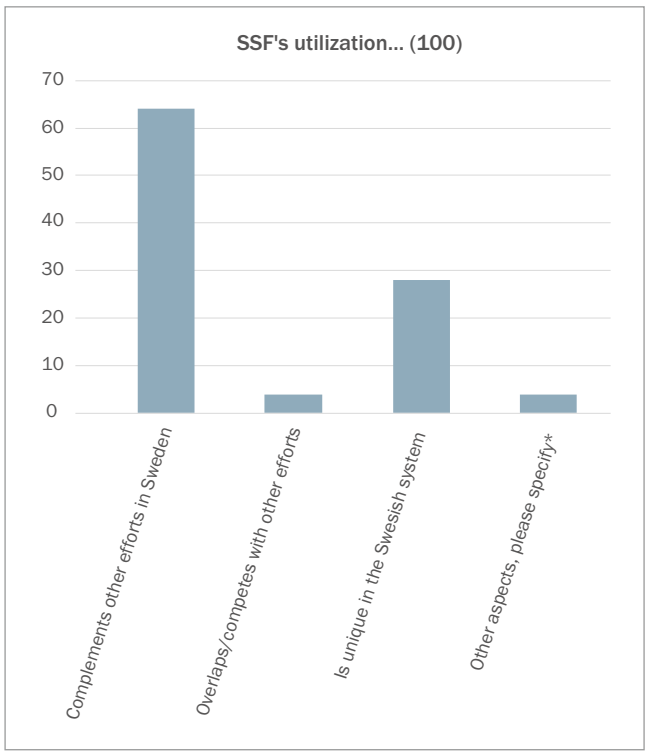


Figure 27. Which statement do you agree with most? SSF’s utilization...

Figure 28 shows the extent to which the respondents agreed with various statements about SSF’s utilization. Comments to this question are presented in 10.3.

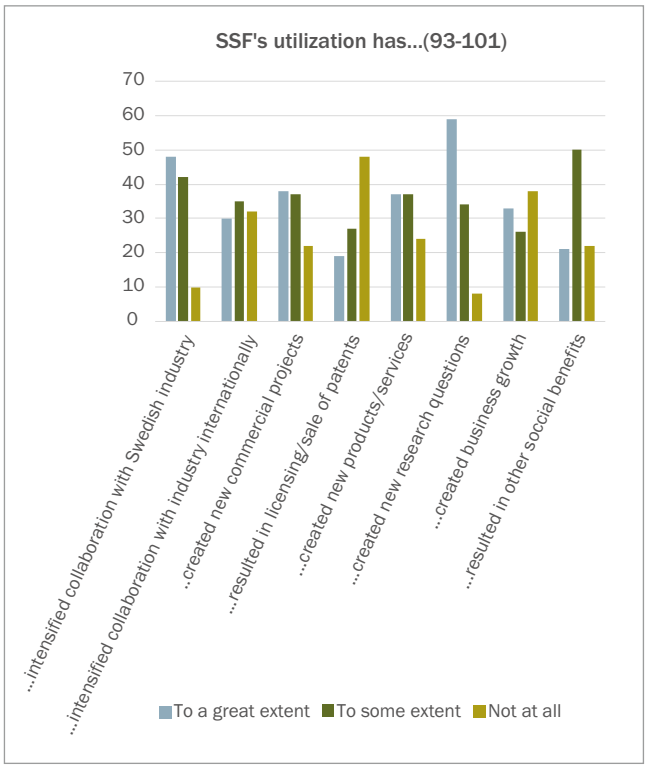


Figure 28. Above are statements about how your utilization results have developed further after the project was finished. Please indicate to what extent you agree with each statement. The utilization results have...

Figure 29 indicates whether the respondents considered that utilization had been correctly funded.

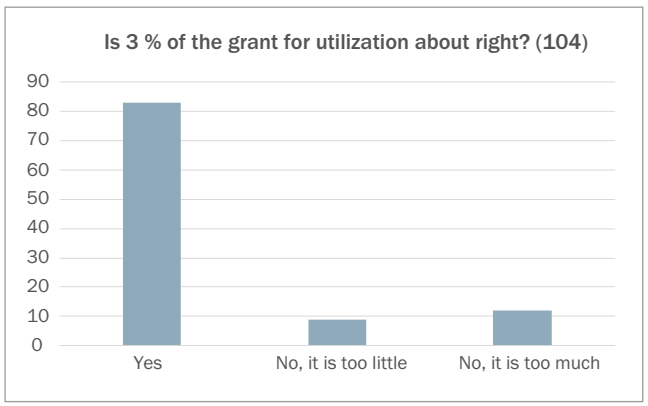


Figure 29. Is 3% of the grant reserved for utilization about right?

Figure 30 shows to what extent the respondents believe that utilization would have occurred without SSF's utilization funding.

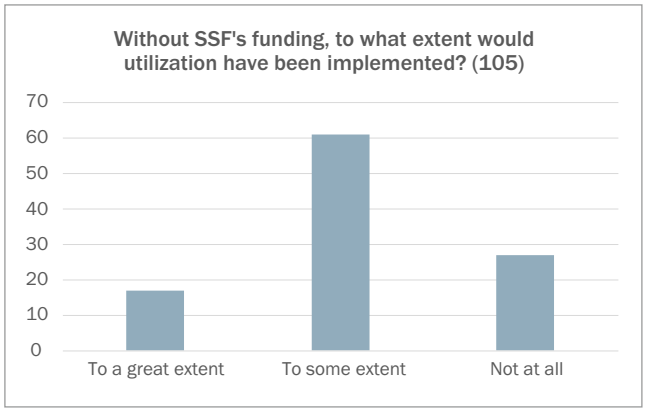


Figure 30. To what extent would your utilization project have been realized without SSF's utilization funding?

Figure 31 shows the potential for utilization after projects were finished, had additional SSF funding been available.

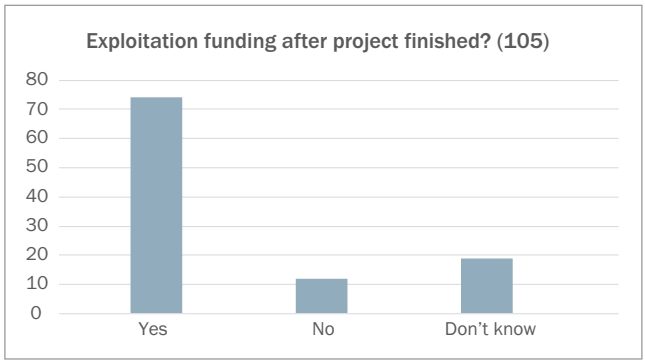


Figure 31. If additional SSF funding had been available, would you have used the opportunity for utilization of the project results after your project was finished?

Figure 32 shows the types of utilization of greatest value to the respondents.

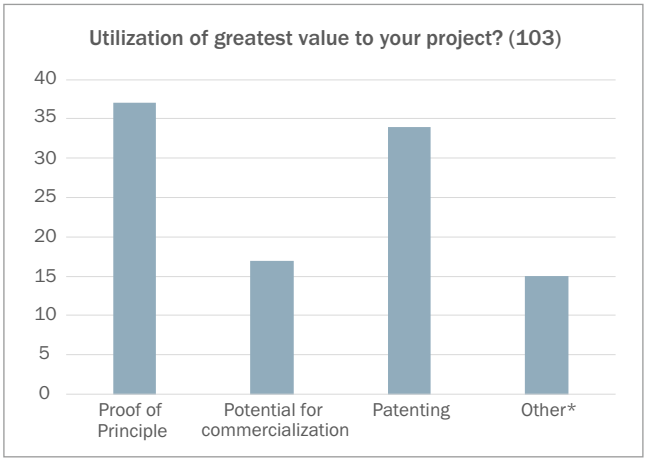


Figure 32. What type of utilization has been of greatest value to your project?

Figure 33 shows the respondents' wish to receive more information about utilization during the funding call period.

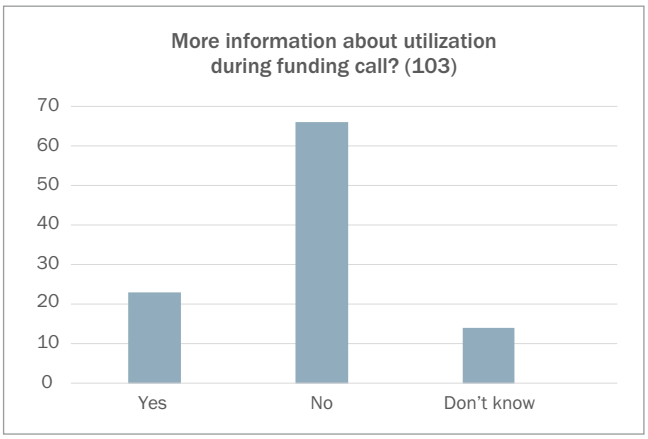


Figure 33. Would you have liked more information about utilization during the call for project funding?

Figure 34 shows the respondents' wish to receive more information about utilization during the project period. There are 21 comments to this question – see 12.3.

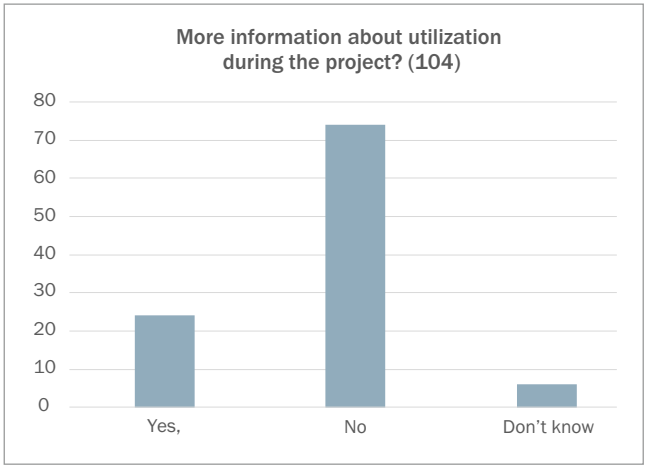


Figure 34. Would you have liked SSF to provide more information about utilization during the project?

Figure 35 shows the respondents' wish to receive more information about commercialization from universities (hosting organizations).

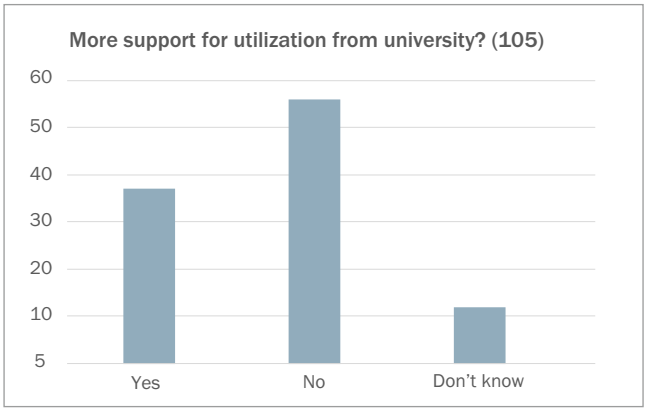


Figure 35. Would you have liked more support from the university with regard to utilization during the project?

Figure 36 expresses the extent of utilization after SSF projects have finished.

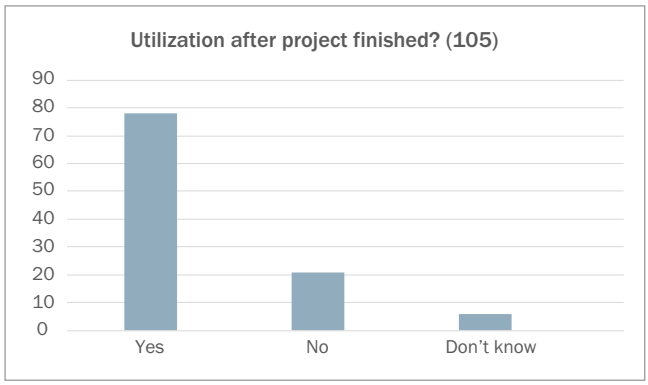


Figure 36. Have you utilized research results after the project finished (without SSF's utilization funding)?

The Programme Committee is an independent group appointed by SSF to follow projects within a specific programme throughout their duration. The group acts as advisers on both specific project issues and general programme issues, and in some cases also as midterm evaluators. The group also makes site visits to all projects several times throughout the duration of the project/programme. The group is composed of experts from industry (e.g., chief scientific officers) and academia (usually from a relevant scientific field). Figure 37 shows the respondents' views with regard to the importance of these committees.

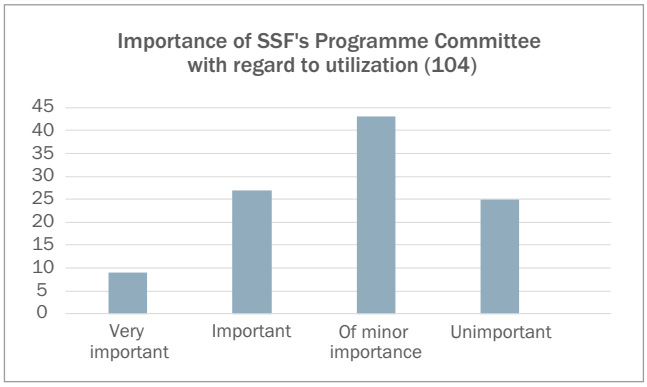


Figure 37. How important was the SSF Programme Committee for your utilization?

The main grant holder applies for utilization funding, i.e. part of the 3%, during the project duration time, normally starting from year two or later. The application is sent to SSF's Scientific Secretary. The secretary evaluates the application and may require complementary information. In most cases the application is approved if it follows SSF's Contract, Appendix 2, Conditions governing utilization of research results with funds from SSF, see 10.6. There are no statistics covering the number of applications rejected by SSF. SSF have estimated it to be less than 2-4% of the total number of applications. Figure 38 shows the importance regarding utilization attributed to the Scientific Secretaries by the respondents.

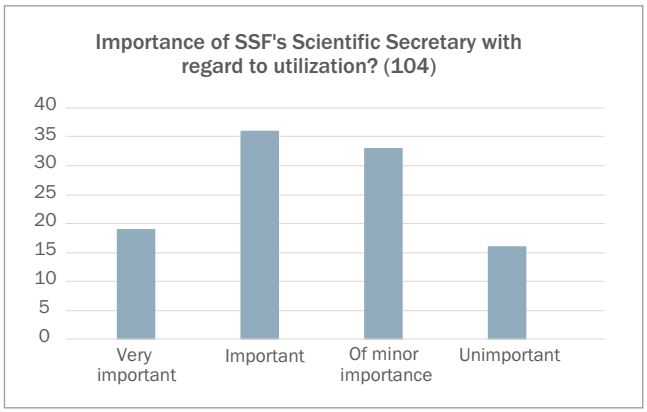


Figure 38. How important was the SSF Scientific Secretary for your utilization?

Figure 39 shows how easy/difficult the respondents found the application process for utilization funding.

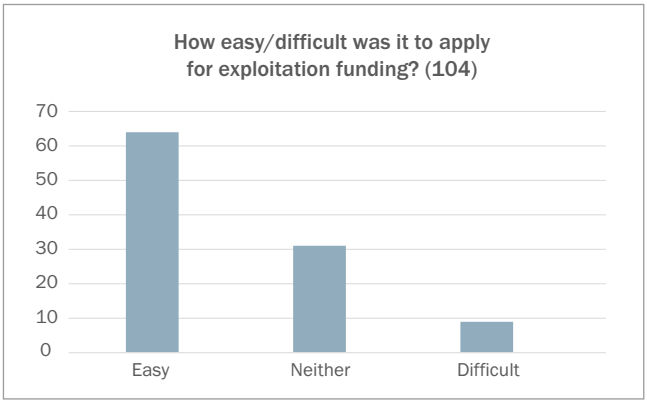


Figure 39. How easy/difficult was it to apply for utilization funding?

The final question in part B required written answers: Any other comments about SSF's utilization? There are 38 comments presented in Appendix 10.3.

10.2.3. Part C

This section of the questionnaire was answered by main grant holders who did not use any utilization funding from SSF. From the analysis of final reports etc in Section 6, we found that 25 of the 166 projects did not use utilization funding from SSF. However, according to Section 6, half of these projects had included utilization without SSF funding. These projects claimed to have produced 24 patents and 2 startup companies. We cannot explain exactly why number of respondents is higher in questionnaire than in the data analysis of the final reports – 35-38 versus 25. The explanation might be that some of the respondents from part B also answered this part or that recollections have been distorted due to the length of time passed since the projects ended.

Figure 40 lists the main reasons for not using exploitation funding.

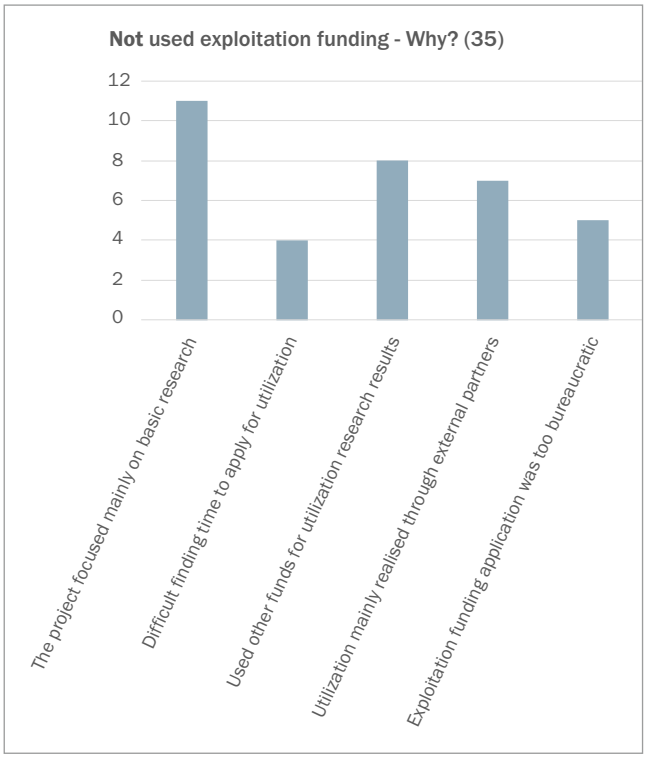


Figure 40. If you did not use utilization funding in your project, what is the main reason for that? (You can choose more than one option.)

Figure 41 indicates to what extent the projects had utilized any research results after the project had finished.

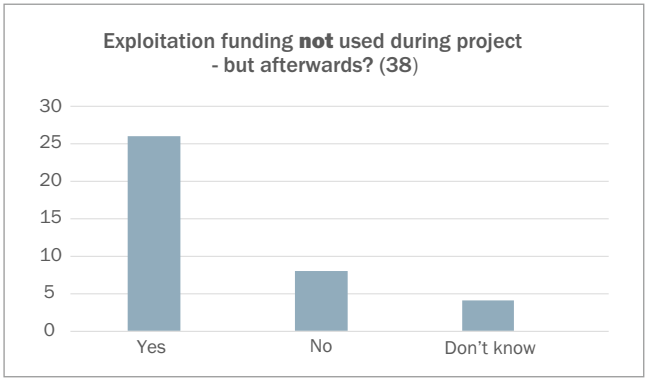


Figure 41. Have you utilized any research results from the project since it finished?

Figure 42 shows the extent of utilization efforts in other research projects after the respondents' projects had finished.

Figure 42. Have you utilized research results from other research projects after your project was finished?

The final question in this section invited the respondents to leave written answers to: Any other comments regarding SSF's utilization?

There are 12 comments presented in 10.3.

10.3. Questions in questionnaire

Questionnaire about SSF's utilization funding

Survey on SSF's Utilization Funding

Thank you for taking part in this survey. Please answer the questions that are relevant to you. For example, if your project finished recently, you may find questions regarding impact after project completion less relevant. The survey comprises three parts:

A) General questions for all respondents

B) Questions for respondents from projects that have benefitted from all or part of SSF's 3% utilization funding

C) Questions for respondents from projects that have not benefitted from SSF's 3% utilization funding.

It takes about 10 minutes to complete the survey and your answers are anonymous. Please respond as soon possible, but not later than **Monday, January 24, 2022**.

If you have questions regarding this survey, please contact Mattias Lundberg, SSF Scientific Secretary, 08-508 81 678, mattias.lundberg@strategiska.se.

Part A: All respondents

1. In what main scientific field do you operate?

Materials Science ❍	Applied Mathematics ❍
Information Technology: Software Development ❍	Information Technology: Hardware Development ❍

Information Technology: Systems Development ❍	Biotechnology ❍
Life Science/Medicine ❍	Other, please specify ❍

2. To what other scientific fields do your activities extend?

Materials Science ❍	Applied Mathematics ❍
Information Technology: Software Development ❍	Information Technology: Hardware Development ❍
Information Technology: Systems Development ❍	Biotechnology ❍
Life Science/Medicine ❍	Other, please specify ❍

3. What year did/will your project finish?

2012 ❍	2013 ❍
2014 ❍	2015 ❍
2016 ❍	2017 ❍
2018 ❍	2019 ❍
2020 ❍	2021 ❍

4. University where the SSF project was carried out? (Main applicant)

Chalmers ❍	GU ❍	KI ❍
KTH ❍	LiU ❍	LU ❍
MDU ❍	SLU ❍	SU ❍
UmU ❍	UU ❍	Other ❍

Part B: Respondents from projects that have benefitted from all or part of SSF's 3% utilization funding

5. Has your work within utilization contributed to "the development of Sweden's future competitiveness"?

Here, SSF is mainly referring to the following:

- Contributed to new products, services, application of new processes or manufacturing methods in industry or delivery of public services, e.g. within hospitals. To demonstrate this type of impact, products etc should have been implemented and made available to the general public.

- Contributed to impact on standards, industry norms and certifications. To demonstrate this type of impact, steering documentation should have been implemented.

- Contributed to other impact, such as sociological. This may include attitude change within digitalisation, social media or the public's perception of sustainability.

Yes ❍	Yes, to some extent ❍
No ❍	Don't know ❍

6. To what extent has SSF's utilization had an impact within society?

Not at all ❍	To some extent ❍	To a great extent ❍

7. To what extent has SSF's utilization stimulated you to engage in utilization (more than you would have done otherwise)?

Not at all ❍	To some extent ❍	To a great extent ❍

8. What factors were decisive for the utilization of research results within the SSF project (you may choose several options, entering 1 for the most important, 2 for the second most important, and so on)?

My work involves mainly applied research ❍

My work involves both basic and applied research ❍

My work involves basic research with long term potential for utilization ❍

It is easy to apply for utilization/utilization funding ❍

The university offers good support for utilization ❍

SSF's utilization funding ❍

Other external support for utilization ❍

Other, please specify ❍

9. Any other national or international examples that you regard as good examples of utilization?

10. Which statement do you agree with most? SSF's utilization...

...complements other efforts in Sweden ❍

...overlaps/competes with other efforts ❍

...is unique in the Swedish system ❍

Other aspects, please specify ❍

11. Below are a number of statements about how your utilization results have developed further after the project was finished. Please indicate to what extent you agree with each statement. The utilization results have...

	Not at all	To some extent	To a great extent
...intensified collaboration with external Swedish industrial partners (incl. hospitals)		❍	❍
...intensified collaboration with external international industrial partners (incl. hospitals)		❍	❍
...created new commercial projects		❍	❍
...resulted in licensing/sale of patent		❍	❍
...created new products/ services		❍	❍
...created new research questions		❍	❍
...created business growth, for instance in start-ups		❍	❍
...resulted in other social benefits		❍	❍

12. Feel free to comment:

13. Is 3% of the grant reserved for utilization about right?

Yes ❍ | No, it is too little ❍ | No, it is too much ❍

14. To what extent would your utilization project have been realized without SSF's utilization funding?

Not at all ❍ | To some extent ❍ | To a great extent ❍

15. If additional SSF funding had been available, would you have used the opportunity for utilization of the project results after your project was finished?

Yes ❍ | No ❍ | Don't know ❍

16. What type of utilization has been of greatest value to your project?

Proof of Principle research ❍ | Potential for commercialization ❍

Patenting ❍ | Other, please specify ❍

17. Would you have liked more information about utilization during the call for project funding?

Yes ❍ No ❍ Don't know ❍

18. Would you have liked SSF to provide more information about utilization during the project?

Yes ❍ No ❍ Don't know ❍

19. If you answered yes to the above, please specify:

20. Would you have liked more support from the university with regard to utilization during the project?

Yes ❍ No ❍ Don't know ❍

21. Have you utilized any research results after the project ended (without SSF's utilization funding)?

Yes ❍ No ❍ Don't know ❍

22. How important was the SSF Programme Committee for your utilization?

Unimportant ❍ Of minor importance ❍ Important ❍ Very important ❍

23. How important was the SSF Scientific Secretary for your utilization?

Unimportant ❍ Of minor importance ❍ Important ❍ Very important ❍

24. How easy/difficult was it to apply for utilization funding?

Easy ❍ Neither ❍ Difficult ❍

25. Any other comments about SSF's utilization?

Part C: Respondents from projects that have not benefitted from SSF's 3% utilization funding

26. If you did not use utilization funding in your project, what is the main reason for that? (You can choose more than one option.)

The project focused mainly on basic research utilization ❍

Difficult finding time to apply for ❍

Used other funds for utilizing research results ❍

Utilization mainly realised through external partners (clinic/hospital, company, research institute) ❍

Utilization funding application was too bureaucratic ❍

27. Have you utilized any research results from the project since it finished?

Yes ❍ No ❍ Don't know ❍

28. Have you utilized research results from other research projects after your project was finished?

Yes ❍ No ❍ Don't know ❍

29. Any other comments regarding SSF's utilization

10.4. Comments from respondents in Questionnaire

In questions 8, 9, 10, 12, 16, 19, 25 and 29 the respondents had the opportunity to make written comments. Their comments are presented below.

Of 189 comments in total, 53 contained criticism/proposals highlighted in grey. The word exploitation and utilization are used synonymously by SSF and in this report.

Question 8: What factors were decisive for the utilization of research results within the SSF project (you may choose several options, entering 1 for the most important, 2 for the second most important, and so on)?

Other, please specify:

• Already collaborating with a start-up company interested in the field.

• Access to suitable contacts within the industry

• Collaborator had previous experience with startups plus we all had strong international networks

• Feels relevant, important, interesting, and fun.

• Developing contacts with industry, encouraged within the project (Prosper), collaboration with industry

• Somewhat illogical questions, but the support from SSF is very important, although in my case it was not significant for decision-making

• SSF gives money to projects that are important and beneficial for Sweden. Specific funding for utilization (3%) is completely meaningless and confusing. It should be done away with.

• An industrial need for the results of the research

• We are always trying to utilize our results wherever possible.

• In this case, the utilization involved an experienced researcher being able to move to industry

•Important to have a dialogue with stake holders, in this case breeders of forest trees that were involved in the project, and foresters.

• The utilization was already catered for through a strong commitment from industrial partners that were able to immediately utilize the results

• Links with biotech companies that are able to turn finding/methods into products / services

• Universities have systems for supporting and developing utilization (in parts, this has already been addressed), but there is an overall strategy

• my mentor

• recruitment of students

• We were able to develop a testbed for so called massive MIMO, now one of the cornerstones of 5G, where we were able to demonstrate that the technology works in practice.

• I am interested in the commercialization of research results. SSF's funding is an important factor (although I rank it no5).

• Provided opportunity to establish permanent utilization and continued use of project data and resources in the form of for instance a biobank.

Question 9: Any other national or international examples that you regard as good examples of utilization?

• Although I am blowing my own trumpet, the project '0D-3D- Producing Power Papers' has just implemented a pilot production trial of fibre-based electrode materials, that I consider a very good example of utilization.

•The US is probably leading within this area. France offers interesting funding opportunities both nationally and regionally.

• Projects that cooperate directly with business, such as most Vinnova, KKS and many EU projects, provide good opportunities for contacts with recipients which establishes a hotbed for utilization. [However, I do believe SSF should keep their model and continue their current role in the innovation system]

• Vinnova's Programme of Competence Centres

• I think there are various more or less ambitious utilization efforts, but the road from an idea to a potential patent is an arduous one. Universities (at least KTH) should be able to offer more help, for instance through the provision of clear contracts that enable newly started businesses to hire lab equipment. At present, it feels as if utilization is a goal, but with an unclear path towards it. If universities (KTH) wish to support utilization, they need to do so more clearly.

• Lots of examples in Sweden (Vinnova), EU, the US (e.g., DARPA)

• Vinnova

• Today, successful international organizations that finance basic/applied research always offer a way of allocating utilization/exploitation funding for, for instance, patenting.

• SSF's model for stimulating utilization is similar to that of the ERC's and VR's PoC which are also highly valuable and strategically important. Other parts of the innovation system are also important, as are angel and risk-taking investors

• No

• Probably doesn't exist.

• Airbus has been committed to our work and has built a portfolio of patents based on our materials in collaboration with us university researchers

• Not as far as I know

• Many Vinnova programmes include requirements for utilization without providing specific funding for it

• I am involved in various projects in the UK that include utilization, among them a project financed by the WellcomeTrust. However, no specific funding has been reserved for this purpose, utilization activities are instead already budgeted for during the application process. Another example is the support provided by the Alan Turing Institute to selected projects with regard to research engineers (https://www.turing.ac.uk/research-engineering). In Sweden, nothing similar exists.

• EU provides good support for utilization through for instance a programme for start-up companies that offers good terms. Relatively speaking, SSF provides limited support for utilization. Perhaps it would be good to separate research funding from utilization funding as in the EU's ERC Programme.

• Don't know.

• The universities' tech transfer offices sometimes offer good assistance, such as KI's KIIAB. More recently, A Working Lab (Academic House) has functioned very well as an arena for utilization.

• VINNOVA support

• not within the application field of the project

• KI Innovations

• Chalmers offers a good system in so far as innovation support and utilization. Also, Chalmers (and several other universities) has adopted a strategic approach towards utilization.

• For example, EPFL, UBC (Vancouver), McGill and others offer postdoc programme for research-related activities linked to utilization projects and newly established companies, located (!) at university departments. This makes it easier for researchers to be active in start-up companies and provides immediate support for the research and education activities that are the researcher's main focus. In addition, new businesses are given access to important infrastructure.

• The results have greatly influenced the current 5G standard. Following the project, we have established a major collaboration project with Ericsson within massive MIMO of the same scale as in the project, with 10 PhD students/postdocs directly financed through them.

• There are clear drivers within for instance EU projects.

• Basic research and discovery of CRISP-R have resulted in very important applications.

• WALP from KAW

• VINNOVA's Competence Centres

• Yes, loads. One example, close to me personally, is SSF supported research into the growth of oats, that has resulted in new more environmentally friendly methods and a business start-up/stock exchange listing

• We are conducting a randomised clinical study where ABC scoring is used to make atrial fibrillation treatment more individually based than the standard treatment. Roche Diagnostics is paying for all the reagents for the biomarkers that are analysed and form the basis for the ABC scoring, and for the analytical instruments used by the hospitals that participate in the study. Here, we have established a very constructive collaboration with industry and funding from industry is essential for conducting this study of 6,000 patients suffering from atrial fibrillation. If the study establishes that ABC scoring is positive for initiating treatment, i.e., fewer cases of stroke and bleeding during treatment with anticoagulants, ABC scoring and several biomarkers could quickly be implemented within routine clinical care. Roche are assisting the utilization of the ABC scoring through establishing analyses of biomarkers at the hospital labs. The study is supported by funding from SSF, the Research Council, The Swedish Heart Lung Foundation and Roche Diagnostics. No funding from any pharmaceutical company.

• Most EU/IMI projects I have collaborated in have had good systems for utilization

• National programmes for translational medical research exist and have existed in the UK, Germany, and Holland, where major long-term programmes have resulted in groups that are highly competitive internationally, driving utilization. SSF's contribution to our project in Sweden has been important, but too brief to have major impact on utilization.

Question 10: Which statement do you agree with most? SSF's utilization...

Other aspects, please specify:

• Motivates researchers to think more about utilization

• SSF is a unique research funding organization that distributes funding in a transparent manner (SSF seems more open than for example KAW). Large and long-term projects are good.

• It is trendy

• Based on SSF's purpose, this support is very important and can encourage researchers to look for applications for their research.

• This is an extremely good initiative. Unfortunately, we patented a discovery far too early before industry became interested.

• SSF is important and complements other efforts in Sweden by providing funding for projects that can help Swedish industry. Therefore, special funding for utilization is completely pointless.

• Unfortunately, the budget for utilization could not be used to a great extent, **it would have been better if I had been able to pay my PhD students, until they had finished their dissertations**, after the project was finished.

• The span of what SSF targets is the advantage and that emanates from what is needed within the project and is aimed at specific activities

• Will attract some to PhD studies, a path they would not have chosen otherwise

• To some extent, SSF's utilization funding is now complemented by for instance the Research Council's Proof-of-Concept

• Flexible administration compared with many other funding organisations

Question 11: Below are statements about how your utilization results have developed further after the project was finished. Please indicate to what extent you agree with each statement. The utilization results have...

Feel free to comment (on question 11):

• Our project continues with limited alternative funding. We have no commercial partner yet and have been unable to successfully file a patent

• Our results have resulted in ongoing development of products / services in cooperation with biotech companies, but we are not yet selling any products / services

• Our initial idea was utilization in the form of clinically applicable biomarkers. However, the research results and the timeframe did not support that. But we were greatly helped by among others our SSF contact who followed up our utilization process. This enabled us to identify, in our research data, other clinically useful applications, resulting in a digital product that is now part of the care offered within VGR for individuals suffering from bipolar disease. The successful

implementation is partly due to the relative flexibility of SSF's utilization funding.

• We developed software that is now used in other collaborative projects with industry. The software will be made universally available.

• We patented a discovery with the help of utilization funding, and contacted a few biotech companies, unfortunately without much success. We may not have approached the relevant and skilled staff in the bigger biotech companies, because several years later these companies became interested in what we had patented, but unfortunately, we had not maintained the patent. This happened at an early stage of my career, and today I would have handled things differently and certainly more successfully.

• Together with Borealis, we hold several patents for materials with hugely beneficial properties for isolation of HVDC cables, several of which have seen second stage development in progressive projects. Personally, I am now retired, but I am in contact with former PhDs currently working in industry. Interest in these issues will now become huge. From what I gather, the funding organizations are not on the ball at the moment, although you ought to be. In order for electrification to be successful, we need to see much more support for electric power technology and materials technology.

• We are working on developing diagnostics for long covid, for which there is a great and immediate need within the health care system.

• We are setting up a company together with a Swedish SME. However, this takes time.

• I was (despite the instructions) unsure how to respond to the above as our framework programme ended on December 31, 2021, and it is too early to evaluate the effects of the finished project. In other words, above answers reflect the expectations and hopes we have for the future. At the moment, we have not fully achieved any of the above points, but: a) intentionally held back patenting in relation to the proof of concept study carried out in respect of predictive drug response b) have an ongoing dialogue with LiU and ORU and their external innovation facilities regarding diagnostic applications c) based on data, we have moved on to carry out a randomised intervention study in which patients gain randomised access to prognostic signature or not, financed by Nordforsk via Vinnova in Sweden, refraining from patenting it) d) formed the basis for successful applications for funding to start-ups where the VI group acts as a partner e) contributed to ORU taking part in an EU funded project around predictive biomarkers in collaboration with a large number of business partners (3TR part of the IMI2 programme). In summary, we have chosen different approaches in different parts of the project, but we have not yet achieved any of the above points in full, although we have made progress.

• Unsure about the form of utilization. We filed several patents, of which one was really good. That patent we would probably have filed anyway. Most universities have innovation hubs, companies, etc that do this anyway. It would have been better to hold back the 3% and instead increase the funding a little (to be used for PhD students etc.), say by 250,000 for every patent resulting from the project. The universities will then be responsible for the patents, which will delight those working for local innovation companies (they can show that they have done something) at the same time as it stimulates the researchers to apply for patents. It seems to me that the format for the utilization has not had a positive response from the universities' innovation companies.

• The results were patented, and the patents were sold to an international company. However, the company switched directions and did not implement them. The overall results were two-fold: a significant tax income for Sweden from the sale of the patents (far more than the original SSF grant) plus a highly trained PhD student. However, the PhD student went to work abroad.

• The duration of the project was of too short for developing new products, although it was proceeding in that direction. Main benefit to society is an increased knowledge that can be passed on to students, and hopefully lead to new product development in the future.

• The start-up company Akthelia, which is based on the SSF project, continues to be developed and is progressing although slowly. The initial cost for patenting was covered by the utilization funding from SSF.

• SSF's utilization funding enabled me to cover the initial costs of filing a patent. Following that I set up a company to cover continued costs. Initially, the company was only barely able to cover the costs, but now margins exist that allow for other things, possibly a first part-time employee in the company.

• The result is a start-up company, resulting in further commercialization. Some emerging research questions, we have been able to finance via a H2020 project that we started following our SSF project.

• The results from the project have exceeded expectations and are important for both university and industry. However, this has nothing to do with utilization funding. It is just that the project was useful.

• The project has just finished, and we will continue the work in accordance with the above.

• The project has a start-up company that has patented technology with the help of utilization funding from the project.

• The project finished in September 2021 and it is a little too early to assess the full industrial impact - however, already many partial results have been spun out in commercial software and new projects.

• There is potential for a spin-off, but it is too early to know if it can be realized.

• Part of the funding for utilization ('bidrag för nyttiggörande') was used for the assessment of commercialization potential and patentability, which lead to highly fruitful and in-depth discussions with KI Innovations and a Patent Lawyer (the latter financed with SSF support). The underlying discovery and all necessary experimental documentation came in rather late in the project and the patent is not filed yet, however through this SSF support we got access to extraordinary good guidance for what is necessary to formulate a strong patent from our research discovery (in progress).

• Utilization is a long process. We patented our discoveries with the help of SSF's funding, then licensed that to a Swedish pharmaceutical company with the help of KIIAB, and the process of further development towards clinical application is still ongoing. In the meantime, we are continuing our academic research around the discoveries we have made in order to understand in more detail the mechanisms involved.

• A new patent filed at the very end of the project; position unclear.

• The opportunity offered by the SSF programme to use utilization funding for patenting innovations has been very important and has resulted in several patents that so far have yielded limited licensing fees (a couple of millions), but which have the potential of forming the basis for several products that are being developed.

• I was the main applicant and coordinator of framework funding (RMA11) that included several co-leaders of projects. Within that group, more than five different companies have been set up. However, I have not been the main driver behind any of these (as I am mainly interested in basic research). Several of the co-leaders of projects (and others that have benefitted indirectly from the research environment that was created) have also enjoyed other support from SSF. Anyway, I am convinced that the R&D environment supported by my framework funding, including the utilization funding that is part thereof, has contributed substantially to the set-up of so many start-ups. How long they will survive remains to be seen, as well as if they, in any measurable way, will contribute to economic or social development in Sweden...

• I am referring to the utilization of the project in general, not SSF's utilization funding specifically.

• Not relevant, the project has just finished.

• The basic technology that we developed has been commercialized by spin-off companies and also licensed to international companies, resulting in it being used in thousands of labs the world over. The ambition is for it to find a place in routine clinical care.

• Helped by among others SSF, I have set up a business that has successfully developed products for the international IT sector. SSF and others have also helped my research environment to successfully join EU consortia, among them the European Processor Initiative, aimed at creating an entirely new industry in Europe. This involves R&D and utilization at the highest level within my field of research.

• Forestry tree breeding is a long-term activity. Our results from the project have now been incorporated in the forestry industry's tree breeding.

• Immersive studies within long-running individual research field, enabling the opportunity to address new issues.

• Our programme resulted in a company being set up. The company's products and the related research now play an important role in three separate research projects. Comments to the question 'Is 3%...' This could be higher, but not without universities receiving guidance on how the funding should be utilized by businesses started within programmes. Within the current framework, it is about right.

• One sub-project focused on magnetic tracking, and following successful demonstrations financed by SSF this led to the start-up Stylaero AB with funding from the LEAD incubator. Unfortunately, no sufficiently large customer was identified despite several companies within various vertical markets being approached, and several demonstrators developed with these. The company was liquidated in the autumn of 2021.

• Enabled by grants for utilization and utilization from SSF, members of the research team at Chalmers and Chalmers Ventures launched the spin-off company OptiGOT AB in 2016. OptiGOT offered laser (VCSEL) design, prototyping, and testing services and had several large customers in the areas of datacom, sensing and high power. The company had six employees and was profitable with increasing revenue. At the end of the project, in 2020, OptiGOT was acquired by Nvidia, a leading company in accelerated computing and artificial intelligence for gaming, datacenters, robotics, autonomous driving, etc. All former employees at OptiGOT are now full or part time employees at Nvidia. With heavy investments by Nvidia, the office in Göteborg is expanding with new recruitments and labs.

• It's only been a few weeks since the project finished and it is still difficult to assess the collective effect of this funding, such assessment will follow later this year when the product is made available to the public.

•The utilization activities within this specific SSF project in applied mathematics have not directly led to licensing/sale of patent nor created new research questions. Generated patents have been paid for by the companies involved and any research questions have been generated as part of the research. However, the software platform that was developed with utilization funding has played an important role in communicating the results of the research to our clinical partners. It has also benefitted society in other ways, both in Sweden and internationally.

Question 16: What type of utilization has been of greatest value to your project?

Other, please specify:

• We used it for field trials of transgenic trees, which could lead to all three of the above.

• We were able to pay for the making of our sensor sweater

• Development of prototype for proof of principle research aimed at patent and commercialization.

• Development of software

• Both proof-of-principle and potential for commercialization have been very valuable.

• Support for data storage and lists of biobanks that enable these to be openly used by other researchers long-term

• Prototype implementation at customer locations with their specific systems

• Development of products within areas where demand exists, but the potential for commercialization is limited.

• Patent and proof of principle in equal measures.

• Open-source code

• Utilization funding has played no part. All the above three points were covered by research funding.

• Software development not directly related to research. Could be regarded as part of 'proof of principle research'.

• In my project, utilization funding has been meaningless, even when a patent is filed, the question is who pays for the patent!

• All of the above was implemented, but especially the outsourcing of the development of demonstration hardware would never have been financed by different means.

• All three collectively in accordance with above

Question 18: Would you have liked SSF to provide more information about utilization during the project?

Question 19: If you answered yes to the above, please specify:

• Even better definition of utilization, especially for what is not commercial utilization

• Further clarify/simplify the process around how/in what way utilization funding can be paid (this is no major criticism as on the whole it has been flexible and good)

• The specific things we could/couldn't do with the money were constantly confusing. How to separate researcher time between research and commercialization activities so everyone was clear on what we were doing when was tricky.

• Difficult to know exactly what the concept can encompass.

• Difficult to adapt utilization to rigid frameworks for and 'opinions' regarding what constitutes utilization. It is emerging and highly 'context' dependent. Wide and permissive interpretation is needed as there is such variation among projects with regard to their progression along the S-curve

• For instance, information meetings could be arranged, setting out the opportunities for using utilization funding

• Somewhat unclear how the utilization funding could be used. Being unable to include university administrative costs (around 22%) was a major problem as invoices are generated by the university which means that costs should first be paid by the university that adds university administrative costs of 22% and this is not covered by the utilization funding, creating problems for financing the 22%

• Clearer directives for what activities can be financed (beyond filing of patents). Also, clearly state that the utilization funding has to be used to pay for external partners, i e consulting fees rather than employment in the project.

• Some more examples and support regarding what can be done

• It was unclear that this amount was taken from the R&D budget, meaning that we could have suggested a budget for R&D and another one for 'nyttiggörande' in the application

• It was not entirely clear for which exact purposes the money can be used. I.e., the use to assess commercialization and patenting is clear yet other use, for example other purposes/outreach was not clear to me. It would have been helpful to get different concrete examples (early on in the project) for what the fund could be used (organization of an information day? lab or project homepage? popular science feature of own lab/research? etc... not certain if any of those apply).

• After SSF's funding period has ended, how can the rolling costs for maintaining a patent be covered?

• The entire concept of utilization is baffling as it is specific for SSF, and few have experience of it. Predatory journals try to access this funding in order to convey 'important' information to the public. It would be better to do away with this part of the funding. Save the money or add it to the regular project budget in order for it to benefit the main purpose of the project.

• Workshops would be welcome halfway through projects at which successful examples of utilization can be presented.

• It would have been good to have at an early stage, a plan for the utilization and how to finance it.

• Sometimes it is very difficult to know when utilization funding can be granted. However, that is a minor problem, compared with the uncertainty displayed by the universities regarding whether or not they are following the rules. I believe communication between SSF and universities could result in guidance that would be of value to individual researchers, as well as to university leaders.

• It would be good to know if it is possible to apply for SSF funding for filing patents or other aspects of utilization.

• To some extent, it was unclear what the utilization funding could be used for within basic research.

• It would be helpful if SSF would follow up and perhaps also in other ways support the utilization through strategic advice or mentorships (in those projects where this is needed or desired).

• Implementing utilization has been a difficult procedure, as third parties have to be involved. It is simply a waste of time and effort, to little benefit.

• just to emphasise its importance

Question 25 is the final question in section B, completed by respondents who have used SSF's utilization funding.

Question 25: Any other comments about SSF's utilization?

• Very good that it was available. It made me make an effort to file a patent with everything that entails.

• Our utilization comprises the following: MetaMEx database (www.metamex.eu) has received 7,815 unique users worldwide, with about 200 users per month. Data from the database is being used daily. Publication is cited by The Public Health Agency of Sweden, regarding physical activity https://www.folkhalsomyndigheten.se/publicerat-material/publikationsarkiv/r/riktlinjer-for-fysisk-aktivitet-och-stillasittande/ Data from MetaMEx database has been used in many publications and collaborations, some of them published already (PMID: 32232327, PMID: 32939754, PMID: 33679435, PMID: 34252634, PMID: 34812516) and others ongoing. One can also see how the data was used in papers that cite MetaMEx.

• We want to emphasise in particular the efforts of Jan Brundell. It was incredibly valuable to have someone of his experience follow our work and join in discussions around ideas.

• We didn't use all of the utilization funding available for our project, which evidently is not unusual. I would rather see that utilization was realized in a more flexible manner while projects are ongoing, i e without a set budget and SSF instead offering the opportunity to apply for special utilization funding after projects are completed. Almost like the Research Council's proof-of-concept funding. I have been involved in several such projects and in these, exchanges regarding utilization were far greater than in the two SSF projects I have participated in.

• We used the utilization funding mainly to file a patent, a process we never concluded.

• We hardly used the utilization part of the project.

• Don't know what SSF's Programme Committee is.

• Regarding the question about the 3%, I think the 'requirement' could be set lower, perhaps at 1%, but that it should be more flexible so that those with a good project could get more funding, as a supplement to the main project funding. For some projects, utilization is merely a construct, while for others it can be very important and might develop in stages.

• Thank you for an important initiative. Good to have this follow-up. How about a funding call for continued support for utilization of results from previous projects?

• **Difficult to adjust utilization to set frameworks for and 'opinions' about what constitutes utilization.** It is something that emerges and is highly 'context' dependent. A wide and permissive interpretation is required as not all projects have progressed to the same point along the S-curve

• As I have already said, it is very important that SSF keeps its 3% support model. In my own case, I had access to alternative avenues for utilization, but this could be very important for stimulating many others to look for applications for their research results.

• As far as I remember, SSF's utilization funding was not something that was well allocated when we applied for our project. Therefore, we had no internal structure for how to distribute the 'project's entire budget' between the four participating research groups. This ended with us not using SSF's funding and instead applying for external funds via our universities. In later projects, the existence of SSF's utilization funding was more clearly stated from the start and we have been able to set up an internal structure for how to share the offer of these funds between different research groups. However, in principle it is not that easy to do this in a project (except when an SSF project only involves one single research group).

• Abolish it...

• Since the completion of the SSF project, other discoveries made by the lab have been commercialized, although not using SSF utilization funding, as in recent years the lab no longer have received funding from SSF.

• See my comment above regarding an alternative utilization scheme, which in my opinion would be better.

• The Programme Committee for our project has provided very clear advice and information with regard to the utilization funding. Good cooperation.

• It would have been easier if the procedure around applying for, and the distribution of funding had been simplified. In our case, activities that potentially could have been supported by utilization funding were instead covered by the R&D funds, possibly as a result of us mis-interpreting the rules around utilization. Suggestion: assess the utilization activities rather than those responsible for them or the distribution of funds.

• Utilization funding is entirely irrelevant. SSF's Research Secretary and Programme Committee have been crucial for ensuring the smooth running and usefulness of our project. Great praise for the entire SSF team.

• The current model is good and at the right level. Perhaps, SSF could put together a directory of 'success stories' that can inspire other projects.

• no

• Very good that this exists! SSF is ensuring real opportunities for results being implemented and spun off.

• LiU has provided funding for initial work on diagnostic biomarkers, including forthcoming scrutiny of news.

• The rule that stops the utilization funding from being used to finance temporary employment in projects is a limiting factor, especially as public procurement regulations make it difficult to buy in technical services from qualified software development consultants.
• Fantastic operation!!!

• I wish I could have used SSF's utilization funding within a year of completing the project. The last year of the project proved very stressful with lots of issues relating to scientific questions and the subprojects, so another year in which funding could be used would have enabled me to finalise the science parts and instead focus more on the commercialization aspects.

• I would like to be able to use 'proof of concept' funding for work in my own lab.

• Within our specific project, I would have rather used the funding for research, as we found an alternative solution for funding utilization. When it all kicked off, we just wanted to start the testbed operations as soon as possible, and we chose to fund this ourselves. At that stage, the procedure for utilization was regarded as cumbersome and focusing too much on startups or patents.

• I believe it sends an incredibly important message that SSF puts aside this much of the resources for these activities. However, I don't think most academics have a clue as to how to commercialize, and the university resources are, at least on my end, weak and unimpressive. I would suggest two things to improve the utilization: a required event for all PIs on how to use this money with speakers from previous grants who have used it successfully talking about the challenges and opportunities and continued flexibility in how the money

is used. I believe the latter is particularly important as the biggest long-term benefit is getting academics to think more about commercialization rather than the specific commercialization outcomes of each grant.

• This is sort of their own concept. So, dialogue is needed with the management of SSF projects.

• The funding is valuable for assessing commercialization opportunities within the framework for the research project. An important result of our work is an improved basis for commercialization from the start. That is very valuable!

• It is an important and unique element of SSF's funding model, but I am calling for discussions with university administrators to overcome the barriers that stops the funding from being utilized to the full, for instance utilization funding for projects with partner companies or companies where the project leader is a co-owner or has become a co-owner during the project.

• Some universities seem to worry about the utilization funding and there may be a trend towards a more restrictive attitude towards utilization as the universities are worried about improper implementation. Here, political action is required and SSF needs to join other players to reset public opinion.

• Separate funding for utilization seems to work better. Grant more funding (3% is not enough for commercial projects, consultant fees etc.) but to fewer projects, and use a separate application procedure for a more critical assessment of the idea/potential for utilization. Otherwise, utilization risks becoming ad hoc, unconsidered, efforts being invented simply because the money is there already.

• It would be good if the funding could be used for a longer period after the end of the project, not just for 6 months. In addition, a better model might be to link the utilization funding directly to the programme rather than to the projects, and that the participating projects apply for utilization funding from the programme. However, I understand that by linking the funding to projects the incentive for using it is greater than if it was just linked to the programme.

• There were some administrative wranglings around the application for/granting of utilization funding for the project - in our case probably due to changing administrator midway through the project.

• Depending on the type of research, some of the big discoveries are made rather late in the 5-year SSF project (e.g., life sciences, stem cell research, etc...). As filing a strong patent often requires more lab work (even if the discovery is certainly worth patenting and has commercialization potential) it would be very helpful if the 'bidrag för nyttiggörande' could be utilized for a longer period after the project has ended (e.g., 1-2 years for the purpose of patenting).

• Good for those involved in basic research to think along these lines. However, we could have done with more information and clearer guidance regarding what the funding can be used for and the procedures around that.

• 3% of the project is perhaps a bit too much. Would it be possible to find another way of stimulating to utilization instead of earmarking lump sums?

Question 29 is the final question in section C, completed by respondents who did not use SSF's utilization funding.

Question 29: Any other comments regarding SSF's utilization

• Remove the utilization funding from your model. Focus on providing funding for good projects that can be useful for Sweden in the spirit of SSF's special mandate.

• See comments on the previous page

• The project's utilization has mainly resulted in the transferral of knowledge and skills from university to a company.

• Very good providing opportunity for utilization but should not be a deciding factor in assessing a project, either before or after. Opportunities for utilization vary depending on the stages reached within the research.

• I find it difficult to answer the above. Our project was scheduled to end in utilization, and our results were in many cases very good and promising in the lab but not 'viable in real life'. (The layers we developed simply did not work long term in high humidity environments or in direct contact with water or other liquids.) We could not see how to progress. During the years in question, related projects were ongoing around the world, and nobody managed to solve the long-term stability for this type of layered materials. However, together with industrial partners etc, we have made good use of the attained knowledge in other projects.

• In our case, we had patented and started the company Scint-X prior to the SSF project. It is good that part of the project funding can be used for patents etc. However, the way in which this has been implemented by SSF, 3% of the project funding are lost if they cannot be used. In our case, we were not aware of the 3% until in the last year and then it was too late to plan for using those funds.

• I think this was a great option. We came close to starting a spin-off relating to our work with Aquaporins but did not do this in the end. We now have a spin-off just starting which aims to provide small items of equipment to others to use the methods of serial crystallography, which were developed in the SSF project and later in an Advanced ERC project, that built from the SSF project.

• For my work, SSF's 3% model is irrelevant for utilization, i.e., having access to or not having access to these funds do not affect whether results are utilized or not.

• Provide opportunity for converting it into project funds that will enable, for instance, PhD students to complete their dissertations.

• I don't know whether it was 'too bureaucratic' -- we had some ideas around how to use the money, but none of our ideas seemed to be acceptable currently. After a previous SSF project, I started a company, and for a period the company received a couple of hundred thousand of direct funding support from SSF. This was hugely significant. But I understand such funding is no longer allowed. However, we have been able to use some ideas from the latest project in the same company.

• Flexibility within projects is important, and as a project leader, I really appreciate that SSF realises this among other things.

• Corona Pandemic!! Unfortunately, it's been difficult to find time given the current situation. Recruitment and collaboration have been held back, unfortunately.

10.5. Information for interviews

The invitation letter to applicants invited to interview/dialogue with ERG

"Dear XX,

The Swedish Foundation for Strategic Research, SSF, have decided to investigate impact of its 3% allocation of grants for exploitation projects between 2009-2021. The study embraces over 160 larger grants with a total budget of € 350 M, 2009 - 2021. Roughly € 7 M have been used for about 380 exploitation projects. 60% of the exploitation funding have been used for Proof of Principle studies, 15% for Assessment of commercialization potential, and 25% for patenting.

The impact study has 4 main questions:

***1.** Does SSF's utilization fulfil the foundation charter´s requirements for "development of Sweden's future competitiveness"?*

***2.** Does SSF's utilization meet the researchers' needs and does it stimulate them to become further involved in utilization?*

***3.** Utilizing or not utilizing - what are the major deciding factors?*

***4.** What good examples are there in SSF's utilization and internationally?*

SSF have appointed a European reference group, experienced on exploitation of research results, to compile the study which is expected to be completed spring 2023.

We use questionnaire and interviews/dialog to further analyze impact during and after projects duration.

You are invited to participate in a 1,5 hours dialog with the European reference group.

In addition to the overall main questions above the ERG want to have dialog around following topics/issues:

***A.** Which aspects of the research project design are more strongly correlated with successful utilization?*

***B.** What is the main problem or main potential with the current setup of SSF utilization support?*

***C**. Can SSF's utilization support be designed to bridge to utilization schemes in other organizations?*

***D.** What is the most important resource or asset resulting in all your utilization efforts carried out up until now?*
If you accept the invitation, please indicate as many alternative dates as possible below and send back to me as soon you can.
Alternative dates for dialog:

You are one of four previous SSF grant holders, used SSF utilization funds, that will be invited to the dialog.

For any questions, please contact Mattias Lundberg, Mattias.Lundberg@strategiska.se or +46 (0)73 358 16 78.

Regards
SSF"

The interviews were carried out as dialogues with a starting point in topics/issues A-D in invitation letter above. Open and closed questions of like the following were asked for follow-up purposes, to generate more details and to probing alternatives, prioritizations, routes etc.:

• Which factors determine if you go for utilization or not?

• How has the SSF utilization grant influenced your utilization, what role has the grant played for you?

• What are the main values that the utilization grant has brought?

• What additional mechanisms or factors or circumstances could have strengthened the utilization efforts even further?

• How has the SSF utilization grant and the utilization efforts affected the design of the research project?

• How do you perceive the current characteristics of the utilization grant?

• How has the utilization grant affected your mindset towards research and innovation?

• What additional resources have the utilization grant helped you access?

• What alterations of the utilization approach at SSF would you like to see?

• What significant barriers in the Swedish ecosystem need further handling?

Interview notes were transcribed and circulated among the ERG members and complemented.

The interviews were conducted February 22, March 16, March 22 and May 22 – 2023

10.6. SSF Contract Appendix 2-Conditions governing utilization of research results with funds from SSF

Swedish Foundation for Strategic Research Contract appendix 2

Conditions governing exploitation of research results with funds from SSF
Adopted: 12 February 2016.

Disclaimer: This English translation is for informational purposes only. The legal document is the Swedish original "Kontraktsbilaga 2".

This appendix to the contract between the Swedish Foundation for Strategic Research (SSF), the project leader and the administrative organization describes how funds retained by SSF for exploitation of research results can be used and how they are disbursed.

SSF's purpose is to support research in the natural sciences, engineering and medicine. SSF shall promote the development of strong research environments of the highest international standard and of importance for the development of Sweden's long-term competitiveness.

SSF has interpreted the above portal paragraph as meaning that research supported by SSF must fulfil two criteria: scientific quality and strategic relevance. These main criteria have remained the same since the start and permeate all calls for proposals issued by SSF.

In order to permit adequate assessment of whether these criteria are fulfilled, SSF uses selection committees consisting of experts who can judge scientific quality as well as experts who can judge strategic relevance. The latter are normally persons with experience from industrial research and development who therefore know how innovation processes work and what is required for an idea to be further developed and exploited, or persons who have other qualified experience of commercial exploitation and entrepreneurship. SSF interprets the term "strategic relevance" in a broad sense. It may, for example, mean that the funded research generates PhDs and/or research results that are attractive to various academic and industrial sectors in Sweden, but also that the research can produce world-class academic environments that attract competent individuals and cooperation partners from various sectors and parts of the world.

SSF finds that a further focus on exploitation is warranted, i.e. beyond the strategic assessment that is made during the selection process. To this end, SSF retains – in the case of projects with budgets greater than SEK 5 M – 3 percent of the grant for exploitation and commercialization of the research results.

Ultimately, the project leader is responsible to encourage exploitation by taking active steps to ensure that the research results are put to use and provide benefit to society. The exploitation plan shall be submitted together with the grant application and be continuously developed throughout the grant period.

Funds for exploitation are used for a specific exploitation activity, which is normally carried out by an outside third party. Requisitions for these funds are made via SSF's web portal. The project leader downloads a form, which, after being filled in and signed, is sent to the responsible administrator at SSF. If the requisition is approved, compensation is paid for outlays against an invoice from the administrative organization or HEI or from the HEI's holding company, based on invoices from a third party, if any (consulting firm or the equivalent). Exploitation often consists of project-specific activities not carried out by public authorities. This means that HEI surcharges for indirect costs are not approved, whereas VAT can be charged by the executing party. The invoice may even go via a holding company at another HEI. The invoice must state the project's registration number and include the text "Exploitation".

Activities that can be cited when requisitioning the retained funds are:

- Proof of Principle studies,
- assessment of commercialization potential (max. SEK 150,000 for each research idea),
- costs related to patenting (max. SEK 150,000 for each research idea),
- other forms of exploitation.

Other forms of exploitation may for example be development of intellectual assets from the project in the form of datasets, models, methods, software, designs, concepts and new kinds of medical treatment. Publication of material in the form of open source, creative commons, toolkits and parts of clinical trials that are not research-related can also be classified as other forms of exploitation.

An exploitation activity should normally be planned so that a party who is independent of the administrative organization carries out a well-defined exploitation service for the SSF-unded project. If the third party is an innovation office or other company under the auspices of the administrative organization, the costs must be related to activities other than those already carried out by the innovation office/company for the university's existing groups (so that they are not "hidden overheads"). The third party may also be a researcher-owned IP company.

SSF does not award grants for pure commercialization or marketing, but may award grants for the steps that precede this. SSF's exploitation funds are not disbursed to companies that intend to commercialize the research idea themselves. All activities during the first three years in preparation for commercialization of research results should be aimed at beneficiaries active in Sweden, where possible.

Whether or not the proposed activity for exploitation qualifies for funding by SSF is determined from case to case by SSF. All activities must be directly related to the SSF-funded research project and must be carried out during the project period. Activities to disseminate information on the project are also evaluated by SSF, see contract appendix 1. However, they do not qualify as approved exploitation costs.

SSF is not responsible for any tax consequences of the researcher's or research group's activities for exploitation when such a grant is received from SSF. The project leader can request compensation for this extra cost via the form "requisition of exploitation funds".

Funds for exploitation that have been retained but not utilized during the grant period revert to SSF. Exploitation funds should not be reported in the financial part of the annual report to SSF, but in the final report on the project.

Following are examples of what SSF considers to be approved versus unapproved costs for exploitation plus examples of service providers (in no particular order).

Approved costs	Example of third party	Unapproved costs
		Research
		Applied research
		Information on research
		Research in collaboration with trade and industry
“Freedom to Operate” study, IP obstacles (max. SEK 150,000 per idea)	Patent consulting firm / Researcher-owned IP company	
Patent costs up to PCT (max. SEK 150,000 per idea)	Patent consulting firm / Researcher-owned IP company	
		Protection and appeal of awarded patents
Clinical trials (parts not regarded as research)	Consulting firm	
Development of new treatment form	Health service/consulting firm	
Development of software	Consulting firm	
Trademark registration (max. SEK 150,000 per idea)	Patent consulting firm	
Costs for design protection (max.SEK 150,000 per idea)	Patent consulting firm	
		Cost for pledge of patent
Proof of Principle studies	Research institute/company	
Feasibility study	Innovation office/research institute	
Research-based verification of exploitation potential (max. SEK 150,000 per idea)	Innovation office/research institute	
		Pure product development
Investigation of scaling-up potential	Research institute	
		Costs when commercialization has begun
Market analysis (max. SEK 150,000 per idea)	Consulting firm	
Business model/plan (max SEK 150,000 per idea)	Consulting firm	
Inventory of intellectual assets	Innovation office/consulting firm	
		Training in exploitation
		Courses in exploitation
		Development of website on exploitation
		Conferences on exploitation
		Marketing
Networking activities aimed at potential beneficiaries	Innovation office	
Construction of demonstrator, for commercialization purposes	Innovation office/research institute	
		Costs when commercialization has begun incl. marketing activities
		Publication in non-scientific journals
		Participation in advertising supplements
		Registration and salaries/operation of own or other’s company
		Financing of holding company or service therein

10.7. European Reference Group including brief CVs

***Fredrik Hörstedt**, Vice President (vice vd), Royal Swedish Academy of Engineering Sciences, Sweden, Chair of the ERG*

CV: Dr. Fredrik Hörstedt is Vice President of the Royal Swedish Academy of Engineering Sciences. He was previously Deputy Director General and responsible for international collaboration at Vinnova, Sweden's innovation agency. He has held leading roles in multiple societal sectors and been a Vice President of Innovation at Chalmers University of Technology where he led the establishment of Chalmers Ventures, a globally top-ranked business incubator. He has been CEO and President of a research technology organisation, and Deputy CEO of a privately held company. He is a previous member of the Advisory Board of the European Innovation Council, EIC, at the European Commission. He is also a previous member of the Future and Emerging Technologies Advisory Group of the European Commission as well as an advisor to the Swedish government on research, innovation, and digitalisation.

***Ana Maria Popescu**, Head of Venture Creation and Pre-seed Investment Director, Chalmers Ventures, Sweden*

CV: Ana Maria Popescu is the Head of Venture Creation and Pre-seed Investment Director at Chalmers Ventures. Chalmers Ventures is Venture Builder and Deeptech Investor owned by the Chalmers Foundation and assigned by the foundation to support commercial utilization of research results coming from Chalmers University of Technology, and beyond. Ana has over three years of experience in her role at Chalmers Ventures where she works closely with researchers and the local innovation ecosystem in bringing technology from lab to market. Before joining Chalmers Ventures, Ana worked for over 8 years as an innovation advisor at Gothenburg University (UGOT) where she gained a certification as a Registered Technology Transfer Professional (RTTP). In her role at UGOT she worked with broad utilization support in projects, developed policies for supporting utilization and coordinated several national projects focused on improving the utilization support ecosystem in Sweden. Further back Ana has experience from the field of intellectual property, working as a consultant.

***Walter Van de Velde**, Policy Officer, DG Connect, European Commission*

CV: Walter Van de Velde brings to the group a vast, hands-on experience with research, innovation, and utilization, gathered in a wide range of contexts, from academia to research performing companies, in small and large businesses and, currently, as R&I policy officer for programme coordination, foresight and synergies in the European Commission. Before, he was heading the Programme Manager's Office of the European Innovation Council, the EU's new deep-tech support programme of which he is one of the 'founding fathers'. It was the natural next step after many years as key person in the EU's Future and Emerging Technologies Programme and, as some called him, 'holder of the FET spirit'. Walter's background is in mathematics (University of Antwerp) with a PhD in Artificial Intelligence (Machine Learning) from the Free University of Brussels (VUB), postdocs in Pittsburgh and Barcelona, and a permanent research position at the Belgian National Science Foundation (NFWO, now FWO/FNRS). For several years he co-directed the VUB AI-Lab, then diving into a life-changing experience as Director of Research of Starlab (Brussels), a business venture performing radically interdisciplinary research. Before joining the Commission, he ran his own consultancy, advising large companies and research actors on their in-house research programmes.

***Siri Brorstad Borlaug**, Research Professor, Nordic Institute for Studies in Innovation, Research and Education - NIFU, and Head of section, Oslo Business School, OsloMet, Norway*

CV: Siri Brorstad Borlaug has through her research career developed in depth knowledge about the added value of research policy instruments and its potential positive and negative impacts on researchers and research institutions. She has further done several studies on researchers' interaction with public and private actors, and evaluated systems and means for knowledge and technology transfer. She is frequently an advisor for different agencies in Norway and Sweden, including Vinnova, the Swedish Higher Education Authority (UKÄ) and the Swedish Research Council.

With assistance from SSF:

***Mattias Lundberg**, Scientific Secretary, SSF, Sweden*

***Joakim Amorim**, Research Programmes Manager, SSF, Sweden*

10.8. Abbreviations

Main universities in Sweden receiving funding from SSF

GU: University of Gothenburg
KI: Karolinska Institutet
LU: Lund University
LiU: Linköping University
KTH: KTH Royal Institute of Technology
UU: Uppsala University
MDU: Mälardalen University
SU: Stockholm University
SLU: Swedish University of Agricultural Sciences

SSF main scientific areas

AM: Applied Mathematics
BT: Biotechnology
LS: Life Science
MS: Material Science
IT: Information Technology

SWEDISH FOUNDATION FOR STRATEGIC RESEARCH

- Supports research and research training within engineering, medicine, and natural sciences in order to strengthen Sweden's future competitiveness.
- Works to reform Swedish research towards excel-lence and impact.
- Creates bridges between basic research and demand-driven research where results will be utilised.
- Continuously finances 300 projects at universities – many of them in collaboration with industry and research institutes.
- Carries out targeted research initiatives that are often interdisciplinary and multidisciplinary.
- Awards career grants to outstanding research leaders, with emphasis on talented young people.
- Encourages researchers' mobility around the world, as well as between academia, institutes, industry, healthcare, and other sectors in society.
- Contributes to the creation of research instruments, methods, and techniques, as well as competence for research infrastructure.
- Annually distributes grants worth several hundred million SEK.

Swedish Foundation *for*
Strategic Research

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