Promoting innovation: how can we boost the impact of SFIs?

Guidance and recommendations

NTNU SINTEF

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Photo: SFI Metal Production, PhD researcher Daniel Perez Clos.

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SFI Industrial Biotechnology. Photo: SINTEF.

Preface

Since 2005, Centres for Research-Driven Innovation (SFIs) have been a key instrument in Norway for promoting long-term industry-oriented research at a high and internationally recognized level. Long-term research in close cooperation between R&D-active companies and prominent research groups will strengthen technology transfer, internationalization and researcher training. A prerequisite for this is that the quality of the research is of high international calibre.

The SFIs are important instrument for increased innovation and value creation through long-term excellence in research. The centres represent platforms composed of participants from research and the business sector as well as the public sector, to ensure that Norway has the competence and capacity that it needs in selected areas. The SFI scheme is an effective response to the government's ambition to increase research efforts in Norwegian business and industry to 2 % of GDP; see the recently presented Long-Term Plan for Research and Higher Education[1].

The evaluation of the SFI scheme in 2018[2] identified several areas for improvement, where the potential for innovation was one of the most important. NTNU and SINTEF host a total of 19 SFIs and are partners in a further eight. Through these SFIs, our academic communities, with industry and user partners, have taken on a mission to develop new knowledge through long-term research, aiming to contribute to the green transition. Exacting requirements for scientific quality apply to research and knowledge development in the SFIs; in addition, all participants in a SFI should meet the following requirements and expectations for helping to ensure that this knowledge contributes to creating value:

Against this background, NTNU and SINTEF have jointly challenged eight of our SFI leaders to share their experience and best practice related to the opportunities for increased innovation and value creation from research activities in the SFIs. These experiences are summarized in this report. In the work on this report, inspiration has been drawn from previous work: Innovasjon i FME[3]-ene.

We thank the working group who have worked on developing these recommendations and hope that this report will provide inspiration and benefit both to the SFIs that are currently active and to future SFIs.

1 Report to the Storting No. 5. Long-term Plan for Research and Higher Education, 2023–2032
2 Damvad Analytics, 2018. Evaluation of the Scheme for Research-based Innovation (SFI)
3 NTNU and SINTEF, 2018. Innovasjon i FME-ene [Innovation in the FMEs]. FME Innovation Task Force. (FME Centres for Environment-friendly Energy Research.)

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May 2023

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Introduction

Centres for Research-Driven Innovation (SFI) are an important instrument for increasing innovation capacity in Norwegian business and industry.

The evaluation of the SFI scheme in 2018, the Damvad report[4], shows that a great deal of relevant research of high international quality is created in the SFIs, and the partners involved are generally satisfied with the results. However, it may be challenging to measure the impact of the centres' contribution to innovation and make it visible, because realization of the innovation potential from a SFI mainly takes place in the sphere of user partners and in very many cases in separate projects that run in parallel with or after the SFI's period of operation. This report aims to share best practices from eight current Centres of Research-based Innovation led by NTNU and SINTEF with others who have been given the responsibility of providing Norwegian society with a knowledge and capacity boost within research topics and research areas of high relevance and timeliness to promote increased competitiveness and societal benefit.

Increasing the ability to innovate is not sufficient on its own as a driver of new innovations. A SFI is an arena where, over time, industry/the public sector and research communities develop science of high international quality that is relevant and of immediate interest to the participants in the centre, and to society, in many different ways. The way that knowledge from the research is translated into value creation by user partners will vary between the different centres because they have different approaches and focus on different links in value chains and will therefore have varying results and effects in the form of products, processes and services. The report is based on recommendations grouped into five main strategies for enhancing the innovation capability of a SFI. The strategies are mutually interdependent and consist of:

- Innovation strategy
- Involvement strategy
- IP management
- Internationalization
- Communication strategy

Illustrated in Fig. 1.

The contributors to the report are representatives from four new (SFI-IV) and four older centres (SFI-III). Altogether, these eight SFIs have 90 participants from business and industry, 14 from the public sector and 11 from research environments outside NTNU and SINTEF, a total of 115 partners. The commitment to the eight centres represents a research and innovation investment of just over NOK 2 billion over eight years, where the Research Council contributes approximately NOK 770 million, while private- and public-sector participants contribute approximately NOK 845 million (financially or in kind). The remaining contribution, NOK 385 million, comes from the research communities. The SFIs involved cover a diverse market with different customer segments, such as marine technology, metallurgy and metallurgical process industries, biotechnology, medical technology, engineering cybernetics, and information and communication technology.

Through exchanges of experience in workshops, the following success factors have been identified:

- Ensure genuine cooperation in the centre between the various players from business and industry, public enterprises and the R&D environments, while being aware of different needs and different business models.
- Clarify the extent and significance of innovation, and ensure that it is visible.
- Companies need to set aside time and resources for active participation so that they can translate research results into innovation in their own activities.
- Document contributions to innovation and potential innovation.
- Management and protection of intellectual property.
- Clarify the expectations for internationalization.
- Exchange of experience between different centres and centre managements.

The text below presents recommendations from our own practice, where we also refer to some examples. The recommendations are sorted according to the five strategies mentioned above.

Trondheim, May 2023

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[4] NTNU and SINTEF, 2018. Innovasjon i FME-ene [Innovation in the FMEs]. FME Innovation Task Force. (FME Centres for Environment-friendly Energy Research.)

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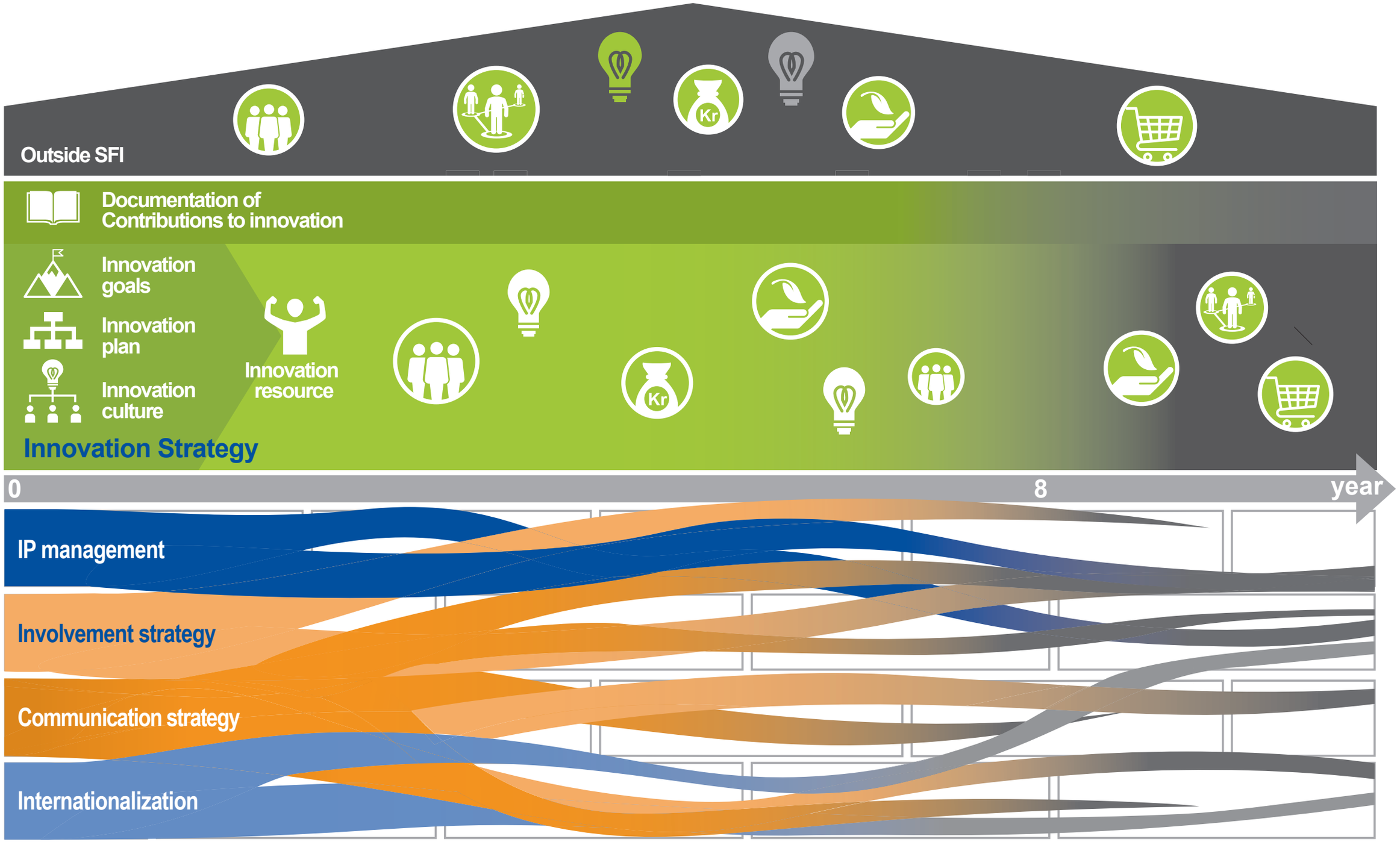

Fig 1: The recommended strategies must be treated as dynamic and should be updated regularly or as needed.

1. Innovation strategy

A broad understanding of innovation should be used as a basis for the centres' inno-vation efforts and the Research Council's definition of innovation[5] should be used.

> Innovations are new or significantly improved products (goods, services), processes, manufacturing and distribution processes, organizational and gover-nance forms, or concepts that are implemented to promote value creation and/or yield benefits to society.
>
> *The Research Council's definition of innovation*

Through research of high international calibre in close cooperation between R&D-active companies, representatives from the public sector, and prominent research groups, a SFI will increase the ability to innovate and create value in the Norwegian business community and the public sector. However, further development of specific products or processes, or implementation of new tech-nology based on the research activities developed in the centre, must take place in separate follow-up projects.

A SFI consists of different partners with different business models, sizes, needs and competitive situations from both the private and public sectors. In the early phase of a SFI's period of operation, it will therefore be appropriate to develop a strategy to ensure effective achievement of goals in terms of research-based innovation, and to create a common understanding of this strategy in the part-nership. Elements that are recommended in such an innovation strategy are:

- **Clarify the SFI's concept of innovation and innovation goals**

Each centre should clarify what innovation means for this particular centre, and for each partner and/or partner group, and jointly clarify how the research results will be implemented by the user partners. Key elements:

  - Understand the partners' need for innovation and clarify research needs that may contribute to innovation. Examples include develo-ping an innovative product, participating in a new market arena, understanding a new market, or contributing to standardization in an existing market. Research results from a SFI will contribute to knowledge that provides partners with a decision-making basis for their innovative choices and help reduce the risk to partners.

[5] Council of Norway] 2016–2020 and Innovasjon i offentlig sektor, Forskningsrådets strategi [Innovation in the Public Sector, Strategy of the Research Council of Norway] 2018–2023

  - Agree on a suitable balance between facilitating research-based innovation, which is essentially the SFI's role and deliverable, and realization of concrete innovations, which must take place at the user partners, often through industry-driven projects (e.g. innovation projects with funding from the Research Council of Norway or directly funded by the partners themselves). Here, the rules for State aid may impose conditions on the funding solution that can be used for concretization/implementation.
  - An example of an innovation concept used in a SFI is "all knowledge/ research results that can be used by a partner in a process, product or service". Another example is research results that have contributed to an innovation project with one or more partners, or that have resulted in licensing for one or more partners.

- **Ensure a common understanding of the centre's innovation model**

This addresses the partners' expectations and how the parties will work together. The model may involve a strategy for proactive exploitation of all results, from open sharing to patenting/confidentiality and commercialization. A fundamental principle for the management of intellectual property (IP) is "as open as possible, as closed as necessary" (see Chapter 3)

- **Build a culture of innovation and trust between partners** to strengthen the ability to achieve value creation through the SFI's work:
  - We suggest putting innovation on the agenda for all relevant arenas for joint meetings in the centre. In this way, the partners become aware of how innovation should be understood, how they can involve their own organization and how they can achieve the greatest benefits from the SFI's work/their participation in the centre.
  - Challenge all partners to clarify what their contribution to innovation might be and how they intend to exploit research results from the centre.
  - Challenge the researchers and PhD candidates involved to think of innovation as an integral part of their research efforts, and that contributions to innovations are included in reporting of the centre's results.
  - Consider introducing specific stimulation measures for the centre, such as an annual innovation award.

- Secure **dedicated individual resources** with special responsibility for innovation processes from the research groups and, if possible, from user partners.
  - Clarify the main principles and roles of an innovation resource at the centre.
  - Establish cooperation with the Technology Transfer Office (TTO) at research organizations.
  - Some centres find it useful to establish an innovation committee with participation from partners.

- **Document the centre's contribution to innovation**
  - Establish a system for reporting potential innovations and contributions to innovation in the SFI, from start-up, during, and after the SFI's period of operation. Examples of any tools and procedures that can be used here can be found in the chapter on IP management. Fig. 2 shows examples of an illustration used by some SFIs and shows the development of research topics versus technology readiness level (TRL) in a SFI.
  - A designated innovation resource is responsible for ensuring that both qualitative and quantitative reporting of contributions to innovation takes place continuously.
  - Reported potential innovations and contributions to innovation should be presented and discussed on an ongoing basis with partners in the centre.
  - The contribution to innovation should be made visible internally in the centre, as well as externally; see also Chapter 5 Communication Strategy.

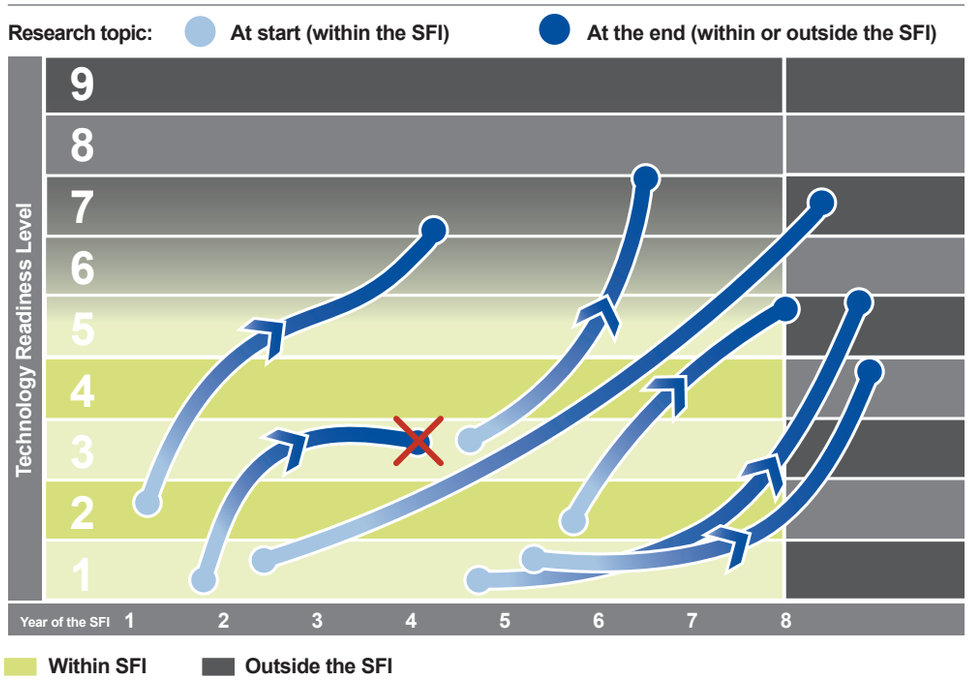

Fig 2: Development of different research topics versus TRL throughout the SFI's period of operation and beyond.

Contributions to innovation

The SFIs must report on a set of performance indicators for all activities in the centre – research, innovation, internationalization, etc. There are growing expectations for the research communities to increase the visibility of the innovations that the centres contribute, and this requires both quantification of results and description of potential innovation effects (impact cases).

Here, we recommend using the same framework to achieve visibility of the contribution to innovation as proposed in NTNU's pilot project[6], consisting of five dimensions:

People, Funding, Networks, Commercialization and Sustainability.

In terms of specific indicators under these dimensions, each centre should clarify which are the most relevant. Examples of these are:

People

- Additionality: New recruitment by all partners (private- and public-sector partners, research partners) due to the collaboration and/or results of the SFI work.
- The number of employees of the user partners who are directly involved in the centre's work.
- Number of BSc/MSc candidates who have authored a thesis in cooperation with partners at the centre. Highly relevant for small and medium-sized enterprises.
- Number of PhD students, postdocs and researchers directly involved in the centre, SFI-associated Industrial PhD students and/or PhD students with a co-supervisor/mentor from user partners.
- Number of graduates (BSc, MSc, PhD) from the centre who are recruited by partners (both user partners and research partners) or other relevant companies in Norway/internationally.

Funding

- Additionality: contribution to spin-off projects where results from the centre play a key role (Innovation Projects for the Industrial Sector (IPN) / Innovation Projects for the Public Sector (IPO) / Knowledge-building Projects for Industry (KPN) / Collaborative and Knowledge-building Projects (KSP) / EU / self-funded industrial projects).
- Increased volume of the centre's activity compared with the volume at the time of the application/start-up (e.g. new partners/increased commitment).
- Partner value creation: contributions to cost reduction, increased production, improved services and exports. This can usually be measured only after the centre's period of operation, in a 5–10-year perspective after the centre ends.

[6] NTNU, 2022. University Innovation Indicators. Final report from NTNU's pilot project.

- Competence building and value creation for players other than SFI partners, since some of the results from a SFI will also be applied by user partners other than those who took part in the SFI. Such effects are difficult to measure.

Networks

- Number of network gatherings for partners.
- Number of open events.
- Number of participants in network gatherings and/or open events.
- Input in public debate / design of policy instruments / political documents.
- Number of media posts with significant reach.
- Further collaboration between SFI partners after the SFI's period of operation.

Commercialization/value creation:
Not all research results can be commercialized, but it is important to have a clear strategy describing how results can be realized if potential for commercialization is discovered.

- Generic/new technology and methods adopted by the partners.
- Number of patents.
- Number of licence agreements.
- Number of open source licences.
- Number of spin-off companies.

Sustainability
This addresses the ways that research results from the centre have contributed and/or may contribute to achieving the UN Sustainable Development Goals in one or more ways:

- Through three dimensions: social, environmental and economic sustainability.
- Through the EU taxonomy aimed at increasing the visibility of impact on one or more environmental goals.

Enhancing the visibility of concrete contributions to innovations or potential innovations with business and/or socio-economic benefits will create better understanding, engagement and motivation. It is therefore important to increase the visibility of impact cases and potential impact cases, preferably in cooperation with user partners. We suggest measuring some of the indicators 5–10 years after a SFI's activity has ended. Implementing this will require additional funding.

Fig. 3 shows our guidance and recommendations for developing an innovation strategy in a SFI based on research of high international standard.

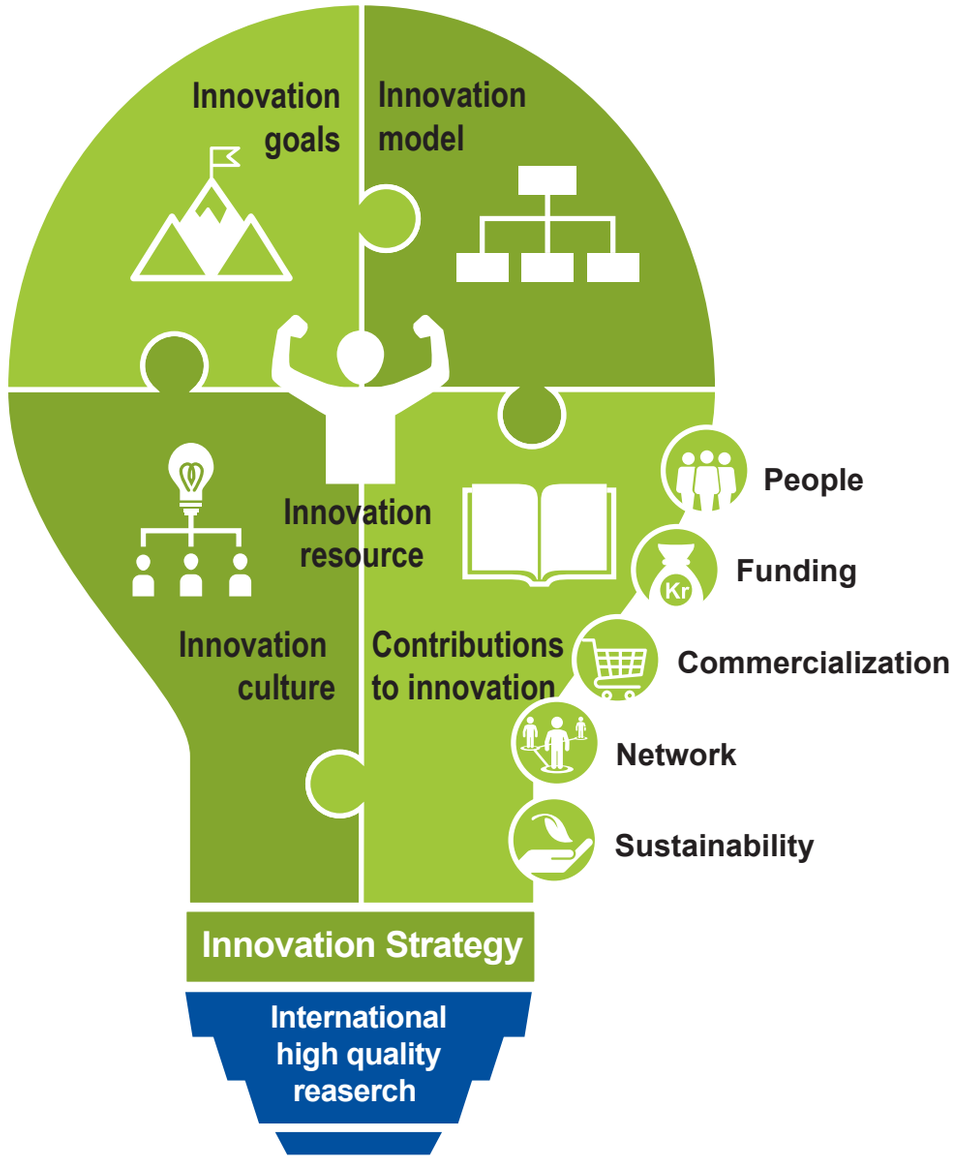

Fig. 3: Innovation strategy.

Guidance and recommendations:

Innovation strategy:

Together with all the partners, establish an innovation strategy for the centre during the first year.

- Clarify the concept of innovation and the innovation goals of your SFI.
- Ensure a common understanding of the innovation model
- Build a culture of innovation and trust between the partners to strengthen the ability to create value through the SFI's work.
- Designate dedicated individual resources with special responsibility for innovation processes both from the research groups and, where possible, from user partners.
- Document innovation and potential contributions to innovation in five dimensions: People, Funding, Networking, Commercialization and Sustainability.

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SFI Industral Biotechnology. Photo: SINTEF.

2. Involvement strategy

A Centre for Research-based Innovation consists of many partners across sectors, both large corporate groups and small and medium-sized enterprises, with different markets and business models. These include participants from the private sector, the public sector and research partners; participants with their own research and development resources and companies with little experience in collaboration with R&D environments and research-based innovation. It is important to keep in mind that the centre's partners are diverse and that they all have different roles in realizing the centre's work and goals.

One of the success factors for a SFI is therefore to ensure that the participants develop a shared understanding of the centre's knowledge and innovation ecosystem. Developing an involvement strategy can be an effective tool to ensure that partners get to know each other, build trust, and understand each other's competence, the needs of the market, the breadth of the research and the role of the research. Everyone should be involved, but not necessarily in the same way. Some companies have the capacity to contribute actively throughout the centre's period of operation, while others may have periodic activity.

Mobilizing genuine cooperation between the parties in a SFI is vital and will determine the degree of success in knowledge transfer between the parties. At the same time, this is a key prerequisite for the funding scheme (SFI scheme) (see the requirements for effective collaboration[7] reflecting the rules specified by the EFTA Surveillance Authority (ESA[8]). Partner participation throughout the centre's period of operation is a prerequisite, from identification of research topics to prioritization and implementation. Experience shows that it can take time for a research centre to mobilize and achieve deliverables that are of interest to, for example, the commercial participants in the centre. An important success factor for the centre's focus on innovation, with reference to the success criteria, is therefore a gradually increasing involvement of partners, in both quantity and quality.

In the early phase of the centre, the focus will be on the research agenda. In this phase, experience indicates that some of the partners have limited resources to mobilize their own organization. Therefore, it should be a goal to involve all the partners so that relevant issues are addressed and the research efforts over time target the challenges of the user partners.

Good involvement is achieved through meetings interspersed with network activity, establishing company-researcher/PhD collaboration, mobility and exchange of resources, and joint development of plans for research and exploitation. Such meeting places/arenas are useful for exchanging views on professional challenges, culture building, creating trust and getting to know all the participants at the centre. In addition, one-to-one meetings with partners may be needed. It is the management of the centre that is responsible for developing and implementing an involvement strategy for the centre:

- **Ensure a common understanding of goals and research topics that include everyone. Clarify expectations. Build trust.**
  A fundamental understanding of the centre's goals and in-depth insight into the centre's knowledge and innovation ecosystem form an important platform for being an active partner in the SFI's work. It is therefore important to:

  - Establish good meeting arenas for the exchange of (innovation) competence and experience between partners. It may be practical to have some large arenas where everyone meets and information is shared, combined with smaller workshops with a special focus, and with annual one-to-one meetings between the centre's management and partners.
  - Activate partners that are less research-intensive, and work to understand their needs and business models.
  - Set up an annual cycle for meeting arenas in the SFI.
  - Involve partners in a reference group for each work package.

- **Define research tasks together with the user partners based on their needs**
  It may be practical to:

  - Create ownership among partners and make the research more relevant, by inviting them to be a supervisor/mentor for PhD or master's degree students. Master's degree candidates can work actively with challenges identified by industry. One year of a four-year PhD programme can be dedicated to relevant work for user partners.
  - Hold update meetings between researchers and partners as needed.
  - Work for joint publication, where possible.

- **Ensure mobility between research partners and user partners. Partners must mobilize their organization to absorb and exploit research results.**

  It may be practical to:

  - Clarify the interests and expectations of each individual in the SFI. Be curious about how a partner informs and involves their organization. Contribute resources from the SFI as needed.
  - Facilitate mobility between researcher and user partners for better mutual learning and involvement.

[7] Research Council of Norway 2019. Centres for Research-based Innovation (SFI) Requirements and Guidelines. June 2019
[8] EFTA Surveillance Authority (ESA), 2020. State aid for research and development and innovation, Consolidated version

- **Include the researchers and PhD students/postdocs as a resource for involvement activities in the centre**

  It may be practical to:

  - Train PhD students in the SFI's ecosystem. This should take place in the first year of their research period at the centre.
  - Ensure that the PhD students know each other and each other's work so that they can collaborate across research fields.
  - Establishing local 'SFI offices' with open workplaces at partner sites is a possible tool. This has worked well for some SFIs.
  - Consider whether it is possible to create special forums for specific target groups. For example: A Young Investigation Forum with participation from all PhD students, postdocs and young researchers as well as representatives from user partners, with the aim of providing young researchers with deeper insight into the SFI's ecosystem, enabling better interaction and insight into the partners' challenges and needs, as well as enhancing the visibility of the centre (inside and outside the centre).

Cooperation in a centre is important for mutual insight and understanding of each other, and mutual learning from each other – see Fig. 4.

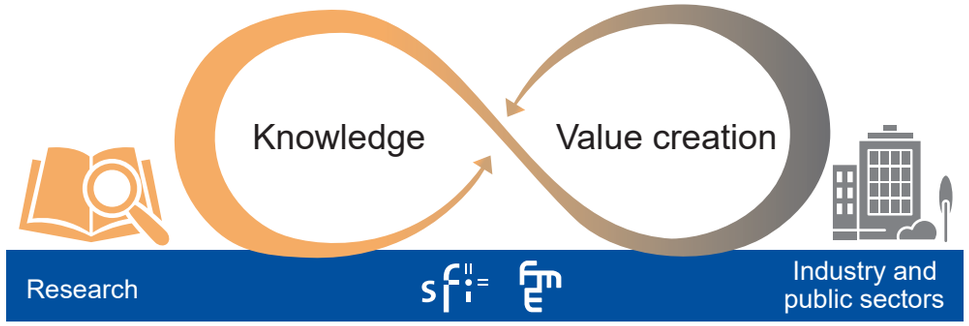

Fig. 4: Collaboration between research organizations and user partners.

Guidance and recommendations:

Involvement strategy:

Together with all the partners, establish an involvement strategy for the centre during the first year.

- Ensure a common understanding of goals and research topics that include everyone. Clarify expectations. Build trust.
- Define research tasks together with the user partners based on their needs.
- Ensure mobility between researcher and user partners. Partners must mobilize their organization to absorb and exploit research results.
- Include the researchers, including PhD students and postdocs, as a resource for involvement activities in the centre.

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SFI Autoship. Photo: SINTEF Ocean.

3. IP management

Both Damvad's evaluation of the SFI scheme[9] and WIPO's Global Innovation Index[10] highlight improved management of IP (intellectual property) as an important success factor for the ability to deliver innovations based on research cooperation.

While information material that introduces the basics of IP and IPR (intellectual property rights) is available from a variety of sources, guidelines for active IP management and use of IP in research collaboration are sparse and must therefore be developed within each research collaboration, based on its own starting point and its individual needs. Predictable and transparent practice for IP management will also influence the motivation for good involvement by different participants in a consortium.

Our experience is that knowledge and experience with IP management is often varied and sometimes inadequate. This means that the rationale and background for the key principles of IP management are little known among the partners' representatives in the research centre. In addition, the wording of the rules for State aid need to be interpreted for operational use.

Legal framework for a SFI

A research centre such as a SFI is subject to a complex and multifaceted legal framework. A legal framework governing IP ownership and rights of use will have a basis at several levels: Norwegian legislation (e.g. the Employees' Invention Act and the Copyright Act), the EEA Agreement (rules for State aid)[11], the contract between the Research Council of Norway and the host institution for SFI (includes the contract, SFI requirements and guidelines, general terms and conditions for R&D projects and project description),[12] [13], and a consortium agreement concluded between the participants in a centre[14]. Steps should be taken to ensure that this framework is known to all participants in a SFI.

Some industrial partners find that the rules for State aid may impose restrictions on innovations that can be realized within the framework of a SFI. It will therefore be important to clarify the SFI's mandate, and how the SFI will contribute to increased innovative drive. The centre's partners will have access to research results from the SFI and can use and implement these in their own activities. However, the actual work on implementing such results with partners must be financed by partners themselves or with other suitable funding opportunities (such as the Research Council's Innovation Projects for Industry and for the Public Sector).

[9] Damvad Analytics, 2018. Evaluation of the Scheme for Research-based Innovation (SFI)
[10] World Intellectual Property Organization (WIPO), World innovation index 2020, Who will finance innovation?
[11] EFTA Surveillance Authority (ESA), 2020. State aid for research and development and innovation, Consolidated version
[12] Research Council, 2021. General terms and conditions for R&D projects.
[13] Research Council 2019. Centres for Research-based Innovation (SFI) Requirements and Guidelines.
[14] Research Council, 2019. Centre for Research-based Innovation (SFI). Template for Consortium Agreement, Research Council of Norway

Key principles of ownership and rights of use

All partners in a SFI must be familiar with the legal framework for a SFI, especially with the consortium agreement that has been signed, which explains terms such as background, results, ownership of results and exploitation of results. In brief, the main principles are: The person(s) who generate results own them. Other partners in the consortium have a preferential right to access rights for commercial use under agreed terms and conditions. In addition, various choices of solutions will be available regarding rights of use, joint ownership, and specific terms and conditions that will vary from centre to centre.

Active IP management and exploitation of results

A key element of the involvement strategy mentioned earlier is to safeguard the interests of the various actors for the exploitation of research results and the associated implications for IP management (described with different perspectives by Egelie[15] and Chesbrough[16]). Effective and transparent IP management will be a prerequisite for good exploitation of the research results. In addition, structured IP management will support the transition between a research plan (activity and accompanying results) and an exploitation plan and contribute to predictable framework conditions for the participants (Figure 5).

[15] Egelie, 2019. Management of intellectual property in university-industry collaborations. Doctoral theses at NTNU, 2019:133
[16] Henry Chesbrough et al, 2019. Value Creation and Value Capture in Open Innovation. Journal of Product Innovation Management, DOI: 10.1111/jpim.12471

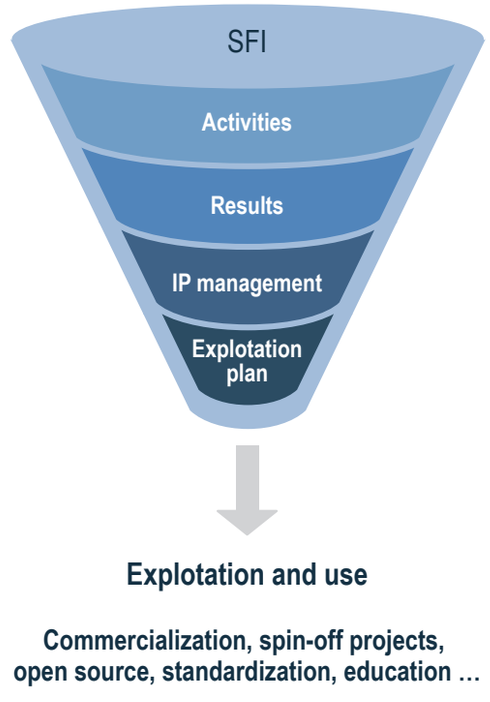

Fig 5: From research activities to the exploitation of research results.

ISO 56005[17] is a guide that proposes some key principles to support IP management in innovation leadership. It addresses various topics regarding IP management at both a strategic and an operational level. For a SFI, we recommend:

- **Establish an exploitation plan for utilization of research results**

An exploitation plan for a SFI should make it clear how research results with potential for innovation will be identified and reported to the centre's management, so that the centre manager together with the user partners and the Technology Transfer Office (TTO) can assess which opportunities to choose for further exploitation/use. In developing the plan, it is important to safeguard the interests of the various stakeholders in exploiting results in a beneficial way. Established arenas in the centre's involvement strategy can be used for such discussions.

- **Establish systematic IP management and apply consistent IP tools and methods**

Examples of some tools:

  - Establish a reporting system for innovations, such as a Declaration of Invention (DOFI). This may include information about research results with innovation potential, names of organizations and individuals involved, type of innovation, Technology Readiness Level (TRL) and potential value creation.
  - Keep track of all reported research results with innovation potential and continuously update the status of these. This list should be available to all partners.
  - Continuously consider research results for legal protection (patent, trademark), or publication.

The SFI CIUS outlines a process for IP management through a licensing process – Fig. 6.

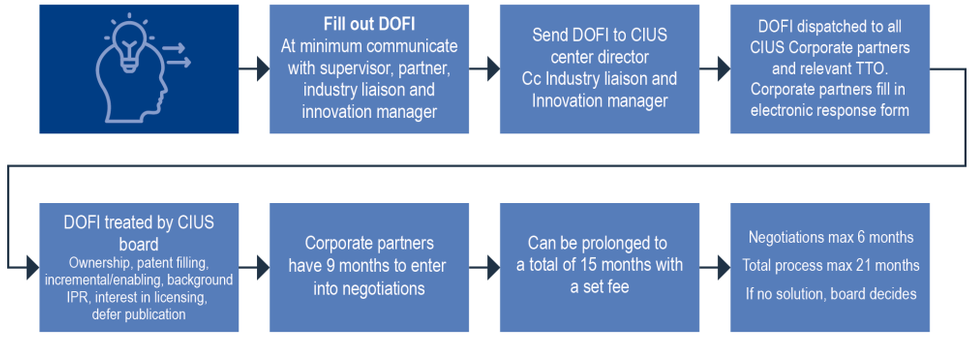

Fig. 6: Process for IP management through a licensing process, SFI CIUS

[17] ISO, 2020. ISO 56005, Innovation management — Tools and methods for intellectual property management – Guidance.

Guidance and recommendations:

IP management

Establish a transparent and predictable structure for IP management during the first two years of the centre's period of operation or by entering into a consortium agreement.

- Familiarize partners with the main principles of IP management, explained in the consortium agreement. This applies, among other things, to the rules for State aid and key principles for ownership and rights of use to research results.
- Establish an exploitation plan that clarifies how research results with potential for innovation are identified, reported and assessed by the centre's management, user partners and the relevant Technology Transfer Office (TTO), and which exploitation opportunities have been chosen for further work.
- Protect the interests of the various actors in the utilization of results.
- Establish systematic IP management and apply consistent tools and methods for IP.

4. Internationalization

There are clear expectations of international participation and cooperation in a SFI, such as international researcher exchange and periods of study abroad. The partners in a SFI are further expected to work actively towards participating and making their mark in international research collaboration, including the EU Framework Programmes[18].

To realize expectations in this area, we recommend developing an internationalization strategy for the centre, based on the following topics:

- **Introduce opportunities and clarify expectations for internationalization in the centre**
  - Consider opportunities for international research collaboration (for example, directed at the EU).
  - Consider international market/export opportunities for and with partners and how research results can contribute to this.
  - Consider international researcher exchange and international research stays.
  - Consider international recruitment of researchers/PhD candidates.
  - Be visible in international research. Plan for international publication (together with user partners).
  - Consider how any research results may contribute to changes/improvements of international standards, guidelines/regulations or input to policy documents, EU Work Plans, etc.
- **Clarify the potential and ambitions for internationalization in the centre**
  - Clarify which partners or partner groups have international ambitions and how these can be fulfilled in the centre.
  - Use an established arena in the centre (see the chapter on involvement strategy) to determine and clarify what internationalization involves in the centre for all partners.
- **Document all international activity throughout the centre's period of operation**
  - Number of EU applications, success rate for EU applications, number of partners involved in international applications, international co-publishing, international recruitment, number and duration of international stays, international market access and export opportunities.

[18] Research Council 2019. Centres for Research-based Innovation (SFI) Requirements and Guidelines

Guidance and recommendations:

Internationalization

Establish an internationalization strategy in the centre in collaboration with partners

- Introduce opportunities for and clarify expectations of internationalization in a SFI.
- Clarify the potential and ambitions for internationalization in the centre, including in terms of the companies' activities.
- Document all types of international activity and achievement using indicators:
  number of EU applications, success rate for EU applications, number of partners involved in international applications, international co-publishing, international recruitment, number and duration of research stays abroad, international market access and export opportunities.

SFI INNOVATION 2023 – Guidance and recommendations

SFI-CIUS. Photo: BERRE AS.

5. Communication strategy

A prerequisite is that traditional research dissemination is handled by a SFI. In addition, it is important to communicate the centre's contribution to innovation. Communication around the innovation mission in the centre should take place with all participants, including PhD candidates, and should be firmly grounded in the partners' organizations.

Here, we recommend developing a dynamic communication strategy that identifies key stakeholder groups for the centre, planning what information to communicate to whom both inside and outside the centre, and how. (See Fig. 7)

It is not necessarily the volume of communication that is the most important, but the effect of what is communicated. Clear procedures should be established for quality assurance of the messages that are communicated.

Figur 7. SINTEF's communication model.

We recommend dedicating a resource in the centre who will be responsible for establishing and following up the communication strategy. Experience shows that it may be an advantage to have a resource with experience as a journalist or content producer in such a role. This resource, typically employed by the host institution, must have close and binding collaboration with the centre's leadership, researchers, innovation manager, and (communication staff in) partner organizations.

Establish good communication channels: both digital and physical channels are needed. Consider which channels will be most effective in reaching the SFI's various stakeholders. The selected channels and meeting places should then be actively promoted and used.

Communication channels with benefits for a SFI include:

- Digital communication arenas, breakfast/lunch seminars, social media and other suitable communication platforms.
- Physical meeting places, preferably on site at some key partners.
- Thematic workshops, external and internal.
- Written communication of good stories; brochures, newsletters, etc., which can be disseminated internally in the SFI's partnership and to external trade associations, professional journals, political decision makers, etc.
- Blogs by researchers about activities in the centre.
- Research dissemination in editor-controlled media.
- Use of information channels already established externally or with partners; podcasts, seminars/webinars organized by trade associations.

Planning, monitoring and evaluation of the centre's communication activities will be useful for adjusting the communication strategy and ensuring effective achievement of goals.

Guidance and recommendations

Communications strategy

Include good communication of the innovation mission in the centre's communication plan

- Define clear goals for communicating the innovation mission.
- Involve all partners including PhD candidates in the communication activities.
- Have a dedicated communications employee in the centre, who is usually employed by the host institution. Ensure close and committed collaboration between the participants.
- Establish procedures for quality assurance of the messages that are communicated.
- Establish good communication channels; digital and physical. Consider which channels will be most effective in reaching the SFI's various stakeholders.
- Monitor and evaluate communication activities and adjust the communication plan as needed

SFI-CIUS. Photo: NTNU.

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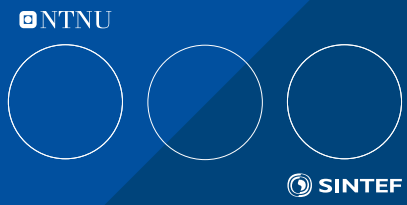
SFI-Harvest. Photo: SINTEF Ocean.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