



SWEDISH FOUNDATION *for*
STRATEGIC RESEARCH

SSF Call for Proposals: Framework Grants for Strategic Research on Materials for Energy Applications

The Swedish Foundation for Strategic Research announces SEK 300 million in a national call for proposals for problem-, challenge- or application-driven research projects that meet the highest international scientific standards. The call aims to stimulate collaborative interdisciplinary research within the area of Materials for Energy Applications, of strategic relevance to present or future Swedish-based industry and to society.

Selected projects will be supported by grants of SEK 4-7 million per year for a period of 5 years (incl. overheads) to be used for salaries (senior researchers, postdocs, PhD students, etc.), research tools, and running costs according to the needs of the project. Funding for the last two years will be contingent upon a successful midterm evaluation.

Background

Providing a secure, clean and efficient energy system is part of the Agenda 2030 Grand Challenges. Sweden has a strong background in energy related materials science both at universities, research institutes and in enterprises, from SME's and private & public national companies to large international companies. Developing novel materials and processes for efficient and cost-effective energy conversion, transport, storage, fluctuations, and utilization of energy are of great strategic importance.

Materials science and engineering deals with the discovery and design of new materials, incorporating elements of physics, chemistry, nano-science and nano-technology. The combination of a materials properties and the availability of the material often constrain the development or applicability of new technologies. The development of new materials with new properties or new processes of materials often lead to technological leaps, and may therefore underpin disruptive innovation. The goal of the present call is to support the development of materials or processes of materials enabling the technologies needed for transformation to a more efficient and sustainable energy system, considering its systemic interdependencies and generally facilitating the introduction of a scalable future energy system. Thus, the Call is in concert with the Swedish Government Strategic Partnership Program on Connected industry and New Materials.

Present and future Swedish enterprises using energy related materials are dependent on both highly educated people and high quality science to be able to stay competitive, and furthermore to have the potential to take shares in upcoming markets.

Scope

The development of the energy system will require increased efforts and resources in order to meet the strategic goals. The present framework program will support Swedish research groups to continue to develop and take the lead in energy related materials science and technology.

The world's energy demands are increasing and together with the challenge of phasing out fossil fuels and facing increasingly scarce resources there is great pressure on developing new technologies for environmentally friendly and efficient energy harvesting, conversion, efficient energy transportation and utilization as well as being able to cost effectively store energy and balance fluctuations in availability and demand. To meet these demands, the development of new materials and processes are needed in a wide range of areas, for example harvesting waste heat and light, and make more energy efficient products by reducing friction or thermal losses. A fossil free energy system will require an increased ability to store energy, both for intermittent use and for mobile transportation as well as for other applications.

The present call is focusing on high-performance materials, materials with special or extreme property profiles, and complex functionality to strengthen Sweden's competitive power.

The call is addressed to research teams with potential to lead innovative research and development in materials for energy applications according to the prioritized areas listed below.

Prioritized research and application areas

Application critical, strategic Materials science areas included in the present call are: materials for

- thermoelectric energy conversion
- battery development
- insulation at high voltages and high voltage circuit breakers
- power electronics
- reducing friction losses
- LEDs and new light sources
- fuel cells and hydrogen storage
- solar cell development
- new fission/fusion power reactors/systems

and other materials for future emerging technologies relating to new energy conversion / transmission / storage / saving that can demonstrate high potential for applications in a time period of 5-15 years.

Projects proposals must meet SSF's two main criteria: high scientific quality and relevance with a practical impact in application. The proposal should be related to the function of a component and / or system, and include a clear description of the added value for the intended application. Theory, modelling and experimentation should be integrated in all proposed projects. An understanding on all relevant levels of magnitude is needed, from the atomic/nano-level up to the formation and cohesion of the material.

New, innovative ideas are welcomed, and all applicants must also consider the conditions for upscaling to industrial applications. The proposed projects should consider system-integration costs around the application-critical material chosen for research and

development, packaging for components, long-term service robustness, product life cycle costs.

Involvement of industry in the formulation of research questions and participation by researchers from industry in the project is considered valuable as it strengthens the strategic element of the research.

SSF will distribute the grants between different areas in order to achieve a strategic portfolio balance.

Strategic relevance

The proposed projects shall aim to provide solutions to important application problems or, in other ways, enable future applications, transformations, products or services. The criterion of strategic relevance means that the proposal shall demonstrate a clear vision of utilisation/exploitation of the research results in Sweden in the medium to long term. Since 3% of the grant is retained by SSF for utilisation/exploitation efforts of research results it is recommended that the PI:s involve a partner that can continuously support such activities. The strategic relevance and the vision for utilisation/exploitation shall be clarified in the application form and is one of the evaluation criteria.

Eligibility

All projects should be based on a credible collaboration between, typically, two to four applicants with different kinds of relevant complementary scientific expertise. The applicants can be from one or different research group(s), not necessarily co-localised - and may be from different departments or universities for added interdisciplinary value. All applicants should take active part in the project and their activities should be at least partly financed by the project budget.

The proposal must be submitted by a main applicant who has the capacity to assume responsibility for the project during the entire grant period. The applicants must be employed by a Swedish university, university college, university hospital, or by a public or private non-profit research institute. At least one of the applicants must be employed by a university or university college.

Project participation from industry, public authorities or other relevant organisations will be considered a merit. However, such participants must not be funded by the SSF grant but may participate on their own budget. Although SSF-grants may not be transferred to universities outside Sweden, they may be used for e.g. visits by foreign-based scientists to applicants working in Sweden (provided stated in the project plan).

The proposal budget should be in the interval of SEK 4 to 7 million per year for five years. A maximum of 25% of the grant may be used for salary for the main applicant and/or the co-applicants, but only to cover up to a maximum of 25% of the salary of each applicant. Junior participants (PhD students, postdocs or other junior researchers) may be funded by 100% of the salary.

Please note:

- each applicant is allowed to be represented in one application as a main applicant.
- each applicant is allowed to be represented in one application as a co-applicant.
- any one person is allowed to have maximum two framework grants simultaneously (with an overlap in time of three years) as a main applicant.

Applications not conforming to these conditions will not be considered. It is the responsibility of the main applicant to inform all the co-applicants and to check the proposal for compliance with the rules before submission.

Proposal and submission

A complete application must contain, among other data specified in the portal, a clear purpose statement, a full description of the research plan and full details of the relevant expertise of the participating groups. It should contain a clear account of the strategic significance of the research in the medium to long term, including a plan for utilisation/exploitation efforts that should commence in parallel with the research activities, already from day one in the project.

Each proposal shall clearly describe the state of the art within the area(s) addressed. It is also important for the proposal to give a clear picture of the resources available and to demonstrate that the proposed constellation of research groups will be effective in view of its objectives.

A Letter of Intent from the Head of the main applicant's department is compulsory.

The proposal must be written in English and submitted via the SSF portal at: <http://apply.stratresearch.se>. Note that in order to get a complete view of all data required for submission it is necessary to consult the portal. Please log on to the portal well in advance of the deadline. Please also submit the application in due time before the deadline. When the application is submitted, the system will reject it if some data field is missing. As long as this is done before the application deadline it is possible to submit and re-submit as many times as necessary.

All applications must be submitted by **14:00 hours (2:00 pm CET) on May 9, 2017**. No additional material will be considered after this deadline.

Evaluation

Applications will be assessed by an evaluation committee consisting of generalists and specialists from industry, academia, and research institutes. In a first selection the applications will be judged primarily with regard to scope (as described above), relevance and potential impact. Furthermore, applications that are judged unable to compete in the final step of the evaluation, or that are considered too incomplete to be meaningfully assessed, will not pass this first step. The selected applications will be sent on international peer review. The results of this expert review will be taken into account by the evaluation committee in order to produce a recommendation on which SSF will base its decision.

The applications will be reviewed using the following criteria:

- Conformity to the scope and eligibility as outlined above
- Scientific quality: originality, strengths, weaknesses, degree of interdisciplinary and feasibility of the research plan
- Strategic relevance, with clear purpose and potential impact of the proposed research to Swedish industry and/or society, including utilization/exploitation plans
- Qualifications of the applicants, previous achievements (scientific and entrepreneurial), international experience, and networks, and leadership/management of research teams.

Timetable

- Last date for applications: 9 May 2017, 14:00 CET at the latest
- Decision by the SSF Board: February 2018
- Project start: February 2018

No additional material submitted after deadline will be considered.

Please note that the Foundation is subject to the Principle of Public Access to Official Records (Offentlighetsprincipen). Thus, applicants should avoid submitting material that they do not wish to be made public, e.g., information that could prevent patenting.

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