

June 2006

Call for Proposals

Research Grants from

ProEnviro

Research Programme for Product Realization with a focus on reducing environmental impact

1. Introduction

The ProEnviro programme will support projects carried out in collaboration between small and medium sized companies, SMEs, and universities/institutes.

The aim is to stimulate the development of a new generation of globally competitive products, production processes and/or services designed for high performance and radical reduction of pressures on natural resources and the environment during their entire life cycle.

The programme is focussed on SMEs **with production and/or development** operating in Sweden. The main aims of the research are *product development, production, product support and maintenance in a life cycle perspective for improved environmental performance.*

The budget for the next 3 years amounts to SEK 60 million. Additional support from other sources, mainly participating industry, is assumed to be about the same amount. This is the first Call for Proposals. A second call is planned in June 2007.

ProEnviro was set up jointly by the Foundation for Strategic Environmental Research, Mistra, and the the Swedish Foundation for Strategic Research, SSF.

2. Background

Competitive pressures on the Swedish and European manufacturing industries are increasing steadily as China, India and other countries continue to develop. At the same time, as more and more people lift themselves above the poverty line to a moderately prosperous standard of life, pressures on natural resources and the environment will increase substantially.

These pressures also create opportunities. The need for new or improved products, production processes and services will grow in both developed and developing economies as consumer pressure, supply chain management and national and international environmental regulations continue to develop.

Sweden as a nation has a long tradition of having a strong manufacturing industry with the ability to develop advanced system products that impose challenging demands on product development, production and customer support. A holistic approach and systems thinking are distinguishing features.

New technological systems designed with sustainable development, high environmental performance, globalization and advanced network structures in mind are changing industrial processes in a radical way. An ever-increasing demand for renewal requires dynamics,

flexibility and adaptability. The global market and competition are also placing increasing emphasis on meeting the needs of the customer throughout the life cycle of the product.

Improving the environmental performance of products, processes and services creates business opportunities. Environmental impact occurs not only in production but throughout the life cycle of a product including distribution, use, maintenance, and recycling. There is an underestimated potential for optimization of life cycle environmental performance during product realization. More effective ways of complying with future regulations could improve competitiveness while enhancing energy efficiency, natural resource efficiency and environmental performance.

SSF has in recent years funded a programme called ProViking whose aim is to stimulate academic research for product realization that can be implemented in Swedish industry. ProViking builds upon a long industrial tradition in Sweden of development of advanced systems and products for the global market. A holistic approach and systems thinking are key elements in this tradition. This is equally true for the large multinational corporations and the many small and medium sized companies.

Mistra has acquired considerable experience over the years in investing in industrially oriented research programmes. Examples range from improving the efficiency of resource utilisation in the Swedish pulp industry and the steel industry to development of new production processes for photovoltaic cells and components for fuel cells.

3. Definition of the research area – the product realization process in a life cycle perspective

The goal of the programme is to produce world-class research results within the areas indicated below and to implement the findings in industry. The support will target the entire product realization process. The research will include the creation of new concepts, theories, methods, tools and procedures/processes. The need to master increasingly complex processes entails a greater focus on the connection between various areas of technology and management: innovation-engineering-operation management or technology management. The research should be aimed at products, services and/or industrial processes.

The market for alleviating pressures on natural resources and the environment will grow in complexity as well as sophistication. Some examples are:

- Energy-efficient products or production processes continue to grow in importance as a means of addressing climate change
- Lean design and manufacture are growing increasingly important as the costs of raw materials rise
- Clean production
- Pressure to design for recycling of products and production processes in order to reduce waste streams
- Recycling technologies for complex materials

The research to be supported should be focussed on areas that are considered to be of key importance for industrial competitiveness. The research programme is geared towards SMEs, including both established manufacturing companies and new emerging companies, and their needs as regards product realization. Visionary and creative proposals – with high potential as well as high risk – are encouraged.



Products and services

The following research areas with a focus on environmental performance and market competitiveness are foreseen:

- Development of system concepts for flexible and adaptable design
- Development with a focus on delivering functions to satisfy customer needs, which will be developed in a creative concept phase involving specification of functions as well as hardware, software and services
- Integrated systems engineering supporting the use of multiple technologies in advanced products
- Development of concepts for flexible and reconfigurable production systems
- Development of “virtual products”, including methods for realistic modelling, simulation and optimization of the functionality of the complete product

Industrial processes

The normal product life cycle – from idea to recycled product – will be shorter in the future. Moreover, customers will demand shorter delivery times from manufacturing processes that must be more cost-effective and that will be executed by a greater number of professional firms working in close global collaboration than today. The strategic importance of the manufacturing system, its concept and the supply chain is emphasized.

Research is foreseen in the following areas, all including environmental performance aspects:

- Product data and knowledge management throughout the life cycle of the product
- Internal processes in combination with external processes in international partnership networks and supply chains
- Methods for analysing and describing value creation in customer terms
- Product realization processes, including innovation, management and organisation
- Production system concepts including the supply chain
- Product system concepts and methods for describing product functions, performance features and geometrical boundary conditions

- Methods and software so that virtual components, subassemblies and platforms, and ultimately the complete products, with or without embedded software and control systems, can be exchanged between units to allow simulation through the whole product life cycle. - The simulation should include the ability to manufacture, assemble, disassemble, use, maintain and recycle the product.
- Product support, including maintenance and after-market activities

4. Operational form of a research project

A research project consists of one or more companies collaborating with one or more universities/institutes to achieve the goals of the project. The project is defined in a *Project Plan* with goals, project team, budget, deliverables, schedule etc. The project is managed by a highly qualified person (*Project Leader*) from one of the participating SME companies. The Project Leader is responsible for the execution of the project as well as liaison with ProEnviro. One of the participating universities/institutes in the research project will be the Trustee (*Grant Holder*) and will administrate the project grant. ProEnviro will sign a framework agreement with the university/institute (Grant Holder). Moreover, a *Project Agreement* will be signed by all participating parties.

The operational form of the project should ensure a research process that promotes world-class research, industrial relevance and efficient implementation of the research results. The outcome of the project will be new and competitive knowledge in the form of methods, tools, products and/or processes.

The project proposal, the research design and the project leadership should meet several criteria, such as:

- The potential contribution to reducing the pressures on natural resources and the environment should be specified
- The market potential as well as the potential for entering the market should be specified
- The contribution to the international competitiveness of Swedish industry in general should be estimated
- The designated research team should meet the highest scientific standards

Prerequisites are:

- Strategic areas with industrial relevance, demonstrated by active participation and leadership by Swedish SMEs that contribute their own money and/or resources
- True collaboration between industry and academia
- Research with a focus on industrial products and/or processes, where the industry serves as a research laboratory to support verification and implementation as well as industrial relevance

More detailed information can be found in sections 5 and 6.

5. Application procedures and deadlines.

ProEnviro will allocate a total of SEK 60 million for the 3-year period from January 2007 to December 2009. Funding will normally be granted for periods shorter than

three years and on a project-to-project basis. This Call for Proposals has been allocated SEK 30 million.

The programme is aimed at SMEs, defined according to the EU. An SME should act as the principal applicant to ProEnviro in collaboration with one or more universities/institutes. Within a given project, the grant could cover the cost of the project leader as well as some relevant research equipment. The SMEs should contribute money and/or resources to the project roughly equal to the grant from ProEnviro. The research performed at the university/institute will also be covered by the ProEnviro grant.

If you have any questions about the programme or the application procedure, you are welcome to contact **Lars Frenning** at ProEnviro, +46 8 50 58 16 79 or e-mail at lars.frenning@proenviro.se

The printed and signed application must be received by SSF before 16.00 hours on 12 October 2006. Please note that an individual at an SME must be responsible for the application.

All documentation must be completed in English. **One** printed and signed version of the application must be submitted complete with enclosures to the registrar's office at ProEnviro, and **one** electronic version in RTF format sent to: lars.frenning@proenviro.se as e-mail. Please **note** that the electronic version must be submitted as **one file** including application and enclosures but excluding signatures. **Avoid scanning in material. Maximum 1.5 MB.** Application by fax is **not** accepted.

Postal address:

ProEnviro

Swedish Foundation for Strategic Research

Box 70483

SE-107 26 Stockholm

Formulation of application. Please visit www.proenviro.se to find basic information including the mandatory APPLICATION FORM.

It is important to follow the application form and to comply with the instructions.

Please note that an application will be rejected if the formal requirements are not met.

Basic requirements have to be filled in.

Proposals must include:

- 1. The application form (mandatory),** including the following information:
 - 1.1. Collaborating parties with group leaders, overall project leader and the university/institute selected to be the Trustee (Grant Holder)
 - 1.2. A plan of intent (no more than 5 pages) including state of the art, clear objectives, project description, description of bilateral collaboration and milestones
 - 1.3 A description of the projected gains with regard to improved environmental performance. - Verify with a brief life cycle assessment (no more than 1 page)
 - 1.4. A brief account of previous research accomplishments of relevance to the project, participation in multidisciplinary cooperation and networks

- 1.5. Other grants (including current applications) which the applicant has received (as main grant holder or other recipient) from research councils, other government sources, research foundations, the European Commission or other external sources

2. Enclosures:

- 2.1. A budget and funding plan providing a clear picture of the planned use of the grant over the intended period, including university/institute, company costs as well as overheads and VAT costs. - Please use the included tables and adapt them to your needs.
- 2.2. The CV (curriculum vitae) of the project leader (main applicant), the group leaders at universities/institutes and other companies (no more than 2 pages each)
- 2.3. A list of publications/patents over the past 5 years by the main applicant and the group leaders
- 2.4. An outline of collaboration between the parties and commitment to cooperate (MOU)
- 2.5. Letters of “Intent and understanding to cooperate” with partners to join and support the project. - Example included

6. Evaluation criteria

The applications will be evaluated according to the overriding criteria given above concerning the purpose of this programme: to support research on product and process realization for improved environmental performance that enhances the competitiveness of the small and medium sized manufacturing companies operating in Sweden. *Strategic and industrial relevance and the support and commitment of small and medium sized companies* are therefore major criteria. The evaluation will consider both research content, with reference to the definition given in section 3, and the research process, with reference to all aspects mentioned in sections 4 and 5. The Board of ProEnviro is responsible for making the decision and evaluating the applications. The Board has an Industrial Council as well as a Scientific Council at its disposal for evaluations.

In addition, the following criteria will be applied in evaluating applications:

- Commercial relevance and scientific level of the proposed research project.
- Ideas and targets set for environmental performance
- Performance record of the proposed project leader
- Scientific level and record of the proposed research leaders and research team.
- Quantified and measurable goals such as environmental impact, reduction of lead times, reduction of cost, reduction of energy use, reduction of raw material input, improved quality.
- Extent and level of cooperation.
- Probability of success.
- Plan for implementation of results.
- Synergy with other granting bodies such as VINNOVA, the KK Foundation and the EU.