

General information about

Project Funding

Swedish Electromobility Centre

Stage IV



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1. Background

The *Swedish Electromobility Centre (SEC)*'s general task is to develop strategically important knowledge and expertise in the field of electric and hybrid vehicles. The aim of the Centre is to support and partner the Swedish automotive and automotive components industry and electrical distribution and energy storage companies. It is also important for the Centre to take a holistic approach to its field to meet environmental and societal requirements. SEC will therefore conduct industrially and societally motivated research in electric and hybrid vehicle technology and the associated charging infrastructure. SEC's primary task is to develop and optimise existing and future technical solutions relating to energy supply, energy storage and propulsion for commercially competitive and energy-efficient electric and hybrid concepts that have a low impact on the environment. The objective requires research on the powertrain, its components and control system, and on infrastructure the ability of vehicles to make use of the infrastructure.

The knowledge and expertise developed must be such that both Swedish universities and companies hold their own in international scientific and market competition. It should be possible to implement the findings of the research projects in vehicles and the charging infrastructure over a period of roughly ten years. Where appropriate, the aim is to find research projects that both involve several universities and are interdisciplinary. To enhance the contact between researchers and industrial engineers, the Centre regularly holds meetings and workshops that cover several topics. SEC also aims to increase exchanges between industry and academia, in part by linking researchers from industry to SEC and by offering PhD students the opportunity to work in industry for a period of time.

1.1. Vision

The Swedish Electromobility Centre will be a world-class research centre, carrying out research and development in electric propulsion and energy supply for road and industrial vehicles (hybrid and electric vehicles), as well as aircraft and maritime vessels.

1.2. SEC objectives

All SEC projects must contribute to meeting the Centre's overall aim. Six success criteria with associated targets have been formulated to measure how well this is achieved. All must have been met by the time SEC Phase IV has been completed (30 June 2023). There are also a number of indicators that must be monitored and report in annual reports and that the end of the phase (**Table 1**). The success criteria and the indicators have been chosen so that together they provide a picture of the scientific excellence of the research and its importance to companies, both in terms of results and the need for qualified workers, as shown below.

Objectives 1 – Interdisciplinary projects

80% of all projects that last for two or more years and are funded by SEC must meet at least one of the criteria below:

- The project must plan and work to ensure that the researcher or PhD student will work for a limited time on site at one of the industrial partners. SEC also encourages industrial researches to work at one of the academic partners for a limited time within the project.
- The project must plan and work for international exchange.
- The project must touch on and collaborate with expertise from a field other than its main field.

Objectives 2 – Interdisciplinary research environment

SEC must offer researchers, PhD students and those working on degree projects from industry an interdisciplinary research environment. The industrial parties must also have the opportunity to participate in SEC's planned PhD courses.

Objectives 3 – Scientifically competitiveness

SEC's projects must be scientifically competitive internationally. SEC must, on average over the period of the phase, publish at least thirty reviewed articles in international journals and/or at conferences every year.

Objectives 4 – Dissemination of knowledge & research findings

The theme groups must convene theme group meetings three times a year, and SEC must arrange an activity that concerns all thematic areas every year.

Objectives 5 – Collaboration

SEC must be involved in at least two projects with other centres or research organisations or major international collaboration projects with operations that can be linked to SEC.

Objectives 6 – Competence supply

Half of SEC-funded research projects that last for two years or more must be PhD student projects. The PhD student should be involved in the *PhD Student Network* and SEC's planned PhD courses.

Table 1. Indicators that are monitored annually.

Indicators	Total	Theme				
		1	2	3	4	5
Patent applications	4	1	1	1	-	1
Reviewed journal articles/conference contributions	120	25	25	25	25	20
Master theses	20	4	4	4	4	4
Doctors & Licentiates	25	6	6	6	4	3
Knowledge reported in writing to the Programme Council	15	3	3	3	3	3
Thematic workshops	20	4	4	4	4	4
International collaborations	5	1	1	1	1	1
Gender equality	40/60	-	-	-	-	-
E-Mobility Day	4	-	-	-	-	-
SEC in the media	8	-	-	-	-	-

More detailed information on SEC-funded projects is available in the following section.

2. SEC-funded projects

SEC funds three different types of project; *Feasibility studies*, *Research projects <2 years* and *Research projects >2 years*. These projects must contribute in various ways to achieving our objectives according to the specifications below (for more details, see **Appendix 1**).

Feasibility studies (max. SEK 200,000)

Application: Max. 4 pages

Requirements:

- Aim to contribute to one or more of SEC's objectives.
- Expertise building and the basis of a larger project for which funding may also be applied for from another funding body. If this leads to further work, this must be associated with SEC.

Delivery:

- A final report as per template with results, conclusions and proposals for continuation.

Research projects <2 years

Application: Max. 10 pages

Requirements:

- Publish reviewed articles in international journals/at international conferences.

Strong

recommendation:

- Fund parts of PhD student projects. The PhD students should participate in SEC's *PhD Student Network* and SEC's planned PhD courses.

Recommendation:

- Offer an interdisciplinary research environment.
- Involved in projects with other centres, research organisations and major international collaboration projects with operations that can be linked to SEC.
- Give an account of the possibility of patent applications.

Delivery:

- A comprehensive final report as per template with results, conclusions and proposals for continuation. The report must clearly state how the requirements and (strong) recommendations have been met.

Research projects >2 years

Application: Max. 15 pages

Requirements:

- Must meet at least one of the following criteria. The project must:
 - Plan and work to ensure that the researcher or PhD student will work for a limited time on site at one of the industrial partners.
 - Plan and work for international exchange.
 - Touch on and collaborate with expertise from a field other than its main field.
- Publish reviewed articles in international journals/at international conferences.
- Fund (parts of) PhD projects. The PhD students should be involved in the *PhD Student Network* and SEC's planned PhD courses.

Strong

recommendation:

- Offer an interdisciplinary research environment.
- Involved in projects with other centres, research organisations and major international collaboration projects with operations that can be linked to SEC.

Recommendation:

- Give an account of the possibility of patent applications.
- PhD students that are funded in-kind should participate in the project.

Delivery:

- A comprehensive final report as per template with results, conclusions and proposals for continuation. The report must clearly state how the requirements and strong recommendations have been met.

3. Process for projects

3.1. Initiation

- All SEC projects must contribute to meeting the Centre's overall aim.
- It is recommended that the project concept be agreed with one of the *Theme Leaders*. See the contact details on SEC's website (<http://emobilitycentre.se>).
- A project must involve (at least) one industrial partner and (at least) one university. The *Theme Leaders* can help bring together the right people.
- As SEC is funded equally by *The Swedish Energy Agency, Academia* and *Industry*, each project needs to specify in-kind funding from both Academia and Industry. This is why all projects must involve (at least) one industrial partner.

3.2. Application

- Remember to start working on your application in good time.
- Application forms and detailed instructions are available on the website.
- Open source code: If you plan to use open source code it must be stated in the application to be approved by the *Programme Council* and the project partners.
- Parties and participants:
 - Only organisations in SEC may be parties to a project (other organisations may be coopted).
 - Parties, in the form of named individuals, must participate in the reference group (other experts may be coopted). **Note what applies to third parties in projects according to the SEC main agreement.**
 - Similar projects could use the same reference group to enhance efficiency.
 - The project participants are the *Project Manager, Researchers/PhD students* and any *supervisors*, plus, where possible, two representatives per industry from participating industrial parties in the project.
- The application must be sent to application@emobilitycentre.se.
- Describe the project group in terms of number of males/females, how the funding is distributed, etc. Please note: It is not expected that each project is gender equal, however this information is relevant for the Centre as a whole.

3.3. Application review

- The full partners and program partners of SEC reviews the applications submitted and a decision is then made by the program council to make recommendations to the Chalmers President.
- For evaluation criteria, see the *Project Application Evaluation*.
- If an application has been approved, the *Project Manager* will sign an agreement with SEC. The agreement contains further practical information, see the *Project Management Agreement*.

3.4. Implementation

- All parties must be active and committed to the project.
- The researchers in the project must participate in the activities and meetings of the theme and the Centre.
- Electromobility competence network:
 - The project is part of a Theme Group and potentially a Focus Group.

- To build the competence network, please send us contact information to students, PhD students and/or researchers that will be involved in the project that are not mentioned in the application.
- Inform PhD students about our PhD network and encourage them to sign in via our webpage (<http://emobilitycentre.se/phd-and-education>).
- Projects may usefully be arranged in clusters around the same reference group (to enhance efficiency).
- Partnership agreements, IPR, confidentiality, etc.:
 - The terms and conditions of collaboration are contained in the Centre's main contract. These include the project manager's responsibilities for IPR, confidentiality and publication.
 - The project manager is responsible for ensuring that all project participants and the members of the reference group are well informed about the content of the contract.
- Kick-off:
 - This is held when the project has started.
 - The Director must be invited and attend if possible.
 - The Centre should be presented (presentation material can be found at *Webforum*).
 - Minutes must be taken at the kick-off meeting and must be saved in the project's folder at *Webforum*. The file name must be Kick-off & the date.

3.5. Documentation & dissemination of findings

- Each project has its own folder at *Webforum* which contains important information.
- Findings are disseminated continuously within the Centre's *Theme Groups* and other SEC forums. The project reports and contributes to the activities of the theme and the Centre on request.
- *Projects >2 years* hold at least two workshops or seminars per annum for the project's parties in connection with reference group meetings.
- When presenting the project, you are expected to use the prepared templates in *Webforum*, including a one-pager about us. Note there are special version for each university. You can also find logotypes for the centre in *Webforum* for all other occasions.
- The project must also save its documentation at *Webforum*:
 - Kick-off minutes
 - Reference group meeting minutes
 - Annual follow-ups
 - Theses (PhD, Lic, MSc)
 - Published articles/conference contributions/reports
 - Final report

3.6. Reference group

- Works to ensure active exchange of knowledge between Industry and Academia.
- Promotes the project and the researcher from academic and industrial points of view.
- Monitors the progress of the project in relation to the project plan.
- Ensures that the project gets the input it needs from industry. Defines and assesses in-kind for the project.
- Promotes the researcher/PhD student by investigating the opportunity to spend around three months at one of the industrial partners.
- Responsible for approving the publication of findings, IPR, etc.

- Reference group meetings
 - The reference group (steering group) must comprise at least one person from each party involved in the project, including the project manager, researchers/PhD students and any supervisors (individuals from other organisations may be co-opted).
 - A project should have between two and four reference group meetings a year, which must be minuted and the minutes saved at Webforum. Shorter projects have fewer meetings. The file name must be Reference group meeting & the date.
 - The Director must be invited to all reference group meetings (for information purposes).
 - Reference group meetings must be minuted (see checklist below), and the minutes saved in the project's folder at *Webforum*. The file name must be Reference group meeting & the date.
- Feasibility studies do not need to have a reference group, but may have one if the parties so wish.

Minutes checklist

- Date
- Fact box in minutes with:
 - Project name
 - Purpose and measurable objectives of the project
 - Parties involved in the project
 - Working researchers and engineers
 - Total cash budget
 - Link to project area at Webforum
- Those present and any apologies
- Minutes of the previous meeting.
- Project findings in relation to the targets in the project plan
- Relevance and benefit of the project to Academia, Industry and Society
- Does the project plan need to be revised?
- In-kind delivered from industry most recently (what/value/provider of information)
- Need for support from industry for future research (in the form of in-kind, etc.)
- Documentation at Webforum

3.7. Follow-up

- The project is monitored by the Director via the documentation at *Webforum*.
- A financial report is submitted annually on request.
- A brief status report is submitted no later than 10 January in the years in which the project is active.

3.8. Conclusion

- A final report must be submitted for each project using the relevant template (available at *Webforum/Website*).
- The project is concluded when the final report and the financial report have been approved.
- When the project has been concluded, the remaining 25% of the amount granted is paid from SEC. Any delay in submitting the final report may result in funds being withheld.

If the project is not implemented as per the decision, does not disseminate information, holds no reference group meetings and does not submit reports in good time, the funding for the project may be revoked.

Appendix 1. SEC Phase IV – Success Criteria & Objectives

All SEC projects must contribute to meeting the Centre’s overall aim. Projects may differ in character and focus on different aspects. The table below summarises the success criteria and associated objectives:

Success criterion	Objective
To create interdisciplinary projects that have researchers or PhD students that work for a limited period of time at industrial partners, collaborate internationally or collaborate across thematic areas.	80% of all projects that last for two or more years and are funded by SEC must meet at least one of the criteria below: <ul style="list-style-type: none"> • The project must plan and work to ensure that the researcher or PhD student will work for a limited time on site at one of the industrial partners. • The project must plan and work for international exchange. • The project must touch on and collaborate with expertise from a field other than its main field.
To offer researchers, PhD students and those working on degree projects in industry an interdisciplinary research environment and the opportunity to participate in SEC’s planned PhD courses.	SEC must offer researchers, PhD students and those working on degree projects from industry an interdisciplinary research environment. The industrial parties must also have the opportunity to participate in SEC’s planned PhD courses.
To carry out projects that must be scientifically competitive internationally.	SEC’s projects must be scientifically competitive internationally. SEC must, on average over the period of the phase, publish at least thirty reviewed articles in international journals and/or at conferences every year.
To disseminate knowledge and research findings by inviting people to meetings in thematic areas and offering joint activities that concern all thematic areas every year.	The theme groups must convene theme group meetings three times a year, and SEC must arrange an activity that concerns all thematic areas every year.
To collaborate with other centres, research organisations or international collaboration projects on at least two projects in SEC’s field.	SEC must be involved in at least two projects with other centres or research organisations or major international collaboration projects with operations that can be linked to SEC.
To enhance the supply of new talent in the field by educating PhD students with key expertise for electric and hybrid vehicles and ensuring that PhD students in related fields receive good knowledge about electric and hybrid vehicles via the planned <i>PhD Student Network</i> .	Half of SEC-funded research projects that last for two years or more must be PhD student projects. The PhD students should be involved in the planned <i>PhD Student Network</i> and SEC’s planned PhD courses.

* SEC does not provide financial support for those working on degree projects. Nor does it compensate supervisors for supervision time. If the degree project work is in industry, the individual in question may be funded in-kind. The link between degree projects and SEC is that SEC’s projects represent a source of good ideas for degree projects.