



SWEDISH
LIFE CYCLE
CENTER

Research strategy

for Swedish Life Cycle Center

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1. Introduction

1.1 Background

In response to an increased societal demand, the participation of industrial and government users of life cycle thinking in the Swedish Life Cycle Center has grown. To maintain the balance between the engagement of such users and the engagement of researchers on whom the Center's credibility also depends, several organizational initiatives have been taken. Two key initiatives include the development of the Academy Group and the creation of the position of Scientific Director. The Academy Group brings together representatives of the partner universities to discuss and plan research and pedagogical actions. The Scientific Director is employed part-time by the Center to drive several activities that strengthen the Center's scientific profile. One of these activities has been to create and maintain a Research Strategy for the Swedish Life Cycle Center in dialogue with the Academy Group and other researchers from the Center's partner institutes. Among other successful outcomes, this led the Center to bring the SETAC Europe 26th LCA Symposium to Sweden, showcasing our research in an international context.

1.2 Research Strategy Objectives

The fundamental aim of the Swedish Life Cycle Center's Research Strategy is to strengthen the scientific profile of the Center. This means:

- enhancing the Center's scientific credentials by attracting the participation of local and international researchers,
- helping to explain to participants how the Center can foster cutting-edge research, and
- providing the Center and Technical Secretariat with guidance on how to support participating researchers.

The rest of this document (parts 2, 3 and 4) is structured around those three points. It has been developed by the Scientific Director in dialogue with the Academy Group and other Center researchers. It also takes some cues from the scientific literature and relevant Center management documents.

1.3 About the Center

The Swedish Life Cycle Center is a Center of Excellence and platform for collaboration between academia, research institutes, industry and government agencies.

The Center's principal activities are:

- orchestration of meetings and network activities for sharing knowledge, skills, experiences and contacts, to inspire the development of new research and to enrich partners' implementation of life cycle thinking,
- delivery of applied research within the field of life cycle management and life cycle thinking, and
- dissemination of research outcomes to influence business and society beyond the Center.

2 Attracting researchers to the Swedish Life Cycle Center

Why would a researcher engage with the Swedish Life Cycle Center? Successful researchers generally have new ideas, money, a test-bed and an interested audience. The Center is useful in relation to all these four factors for successful research, and has been endorsed by local and international researchers in various management review processes:

“A key strength of the Center is the increasing number of relevant partners from academia, industry and government agencies. This is clearly one of the success factors that contributed to the strong record of accomplishment of the Swedish LCA community.”

Professor Matthias Finkbeiner, Technische Universität Berlin

“Mutual learning has been extensive. We, the LCA experts, have been able to conduct assessment studies with a quality we would never have been able to achieve on our own. And the technology experts on the other hand, have learned about the systemic life cycle implications of their choices in technology development.”

Professor Emerita Anne-Marie Tillman, Chalmers University of Technology

2.1 An “ideas factory”

The work of research institutions and universities is typically more potent when connected with industrial and government partners. Participation in Center activities connects researchers to other researchers with interesting research questions and ideas, and to industry and government stakeholders with interesting problems. Working Groups, seminars and other Center meetings are great places to meet people who have similar interests but other perspectives and access to new data.

2.2 A path to funding

For many research funding agencies, industrial and government partnerships are meritorious or compulsory elements of funding applications. Participation in events and networking activities by the Swedish Life Cycle Center has proven itself a useful means for partnership matchmaking between researchers and industrial partners. The events provide researchers with business intelligence, helping to identify priorities for research and training activities in which Center partners are willing to provide cash or in-kind support for funding applications.

2.3 A test-bed

Swedish Life Cycle Center partners span a wide range of industrial and public policy fields. Researchers have said the Center enables them to have high level discussions with other researchers and decision-makers in industry. This enables researchers to use other Center partners as sources of inspiration, data and places to test the practicality of their theoretical ideas. The Center's Technical Secretariat can assist researchers with coordination of larger projects. Being able to rely on the existing Swedish Life Cycle Center Main Agreement can reduce the legal effort otherwise necessary for negotiating the basis of a consortium.

2.4 A wider audience

The Swedish Life Cycle Center is a great channel for dissemination of research findings to an audience interested in life cycle research. Being a grouping of parties with similar thematic interests, it can also provide researchers intent on method harmonisation or influencing stakeholders with the mandate and credibility that only a national, multistakeholder research node like the Center can offer.

3 Doing research with the Swedish Life Cycle Center

The Technical Secretariat disseminates research through its communication and networking activities and can coordinate parts of a new project or offer administrative support to the project manager if appropriate. It does not have a standing research budget you can apply for each year, like e.g. Formas. On the other hand, new research projects arise among partners both from discussions within various Center fora and on account of request from external organizations, and there are various ways for a researcher to usefully connect a research project to the Center.

3.1 Full-scale Swedish Life Cycle Center projects

One of the benefits of a full-scale Center project is the pre-existence of a supportive legal framework in the form of our Main Agreement. Ideally, to foment collaboration and mutual learning, a Center project includes at least three participating partner companies/government agencies plus two of the partner universities or research institutes. This is not a strict requirement - researchers initiating projects have the right to determine the consortium of participants in a project but additional participants can increase the credibility of the project outcomes. The steps for creating a Center project are:

- a) Check your idea is in line with the Research Strategy and the Center Operational Plan.
- b) Read the Operational Handbook for guidance on practical management.
- c) Form your consortium.
- d) Inform the Technical Secretariat of the project idea, funding call, participants, and deadline for submission.
- e) The Center Board makes a decision about inclusion in the Center project portfolio.
- f) Discuss support functions and budgeting with the Technical Secretariat.

3.2 Opportunistic Swedish Life Cycle Center projects

These are called “Center Administration” projects in the Operational Handbook. The Center is regularly contacted by companies and funding agencies asking for particular pieces of research to be performed, which might be large or only need a single researcher for a short period. When relevant, the Technical Secretariat will reach out to relevant participating researchers under these circumstances and bring you into contact with the commissioner’s representative.

3.3 Symbiotic external projects

Collected under “Other projects” in the Operational Handbook, researcher-initiated projects at partner institutions can be made to interact with the Center in mutually beneficial ways. This is done on a case-by-case basis and the first step is always to contact the Technical Secretariat or Scientific Director to discuss potential interactions.

- a) Reference groups

Researchers have added in Swedish Life Cycle Center-coordinated reference groups in previous projects, as a way of including an external perspective and disseminating results. The Technical Secretariat can potentially fulfil a useful administrative support function here.

- b) Networking and communication opportunities

There is potential for researchers to affiliate projects with the Center by integrating project dissemination plans with the Center calendar at suitable times. They can also suggest new working groups on scientific topics for administration by the Technical Secretariat.

4 Swedish Life Cycle Center and Technical Secretariat actions to support research

To enhance the scientific visibility of the Swedish Life Cycle Center, the Technical Secretariat should:

1. Over the next 3 years pursue the goal of bringing a scientifically important LCA/LCM conference to Sweden with the Swedish Life Cycle Center as host.
2. Continue the Scientific Directions Update newsletter, webinars and life cycle talks for disseminating research.
3. Administer working groups on scientific topics.
4. Encourage working groups and other Swedish Life Cycle Center constellations to make joint publications, conference sessions and other outputs referencing the Center as an affiliation where possible.
5. Reach out to other universities for potential partnership.
6. Sound out partners regarding the establishment of a Swedish Life Cycle Center young analyst award.

The Swedish Life Cycle Center should continue other longstanding activities such as

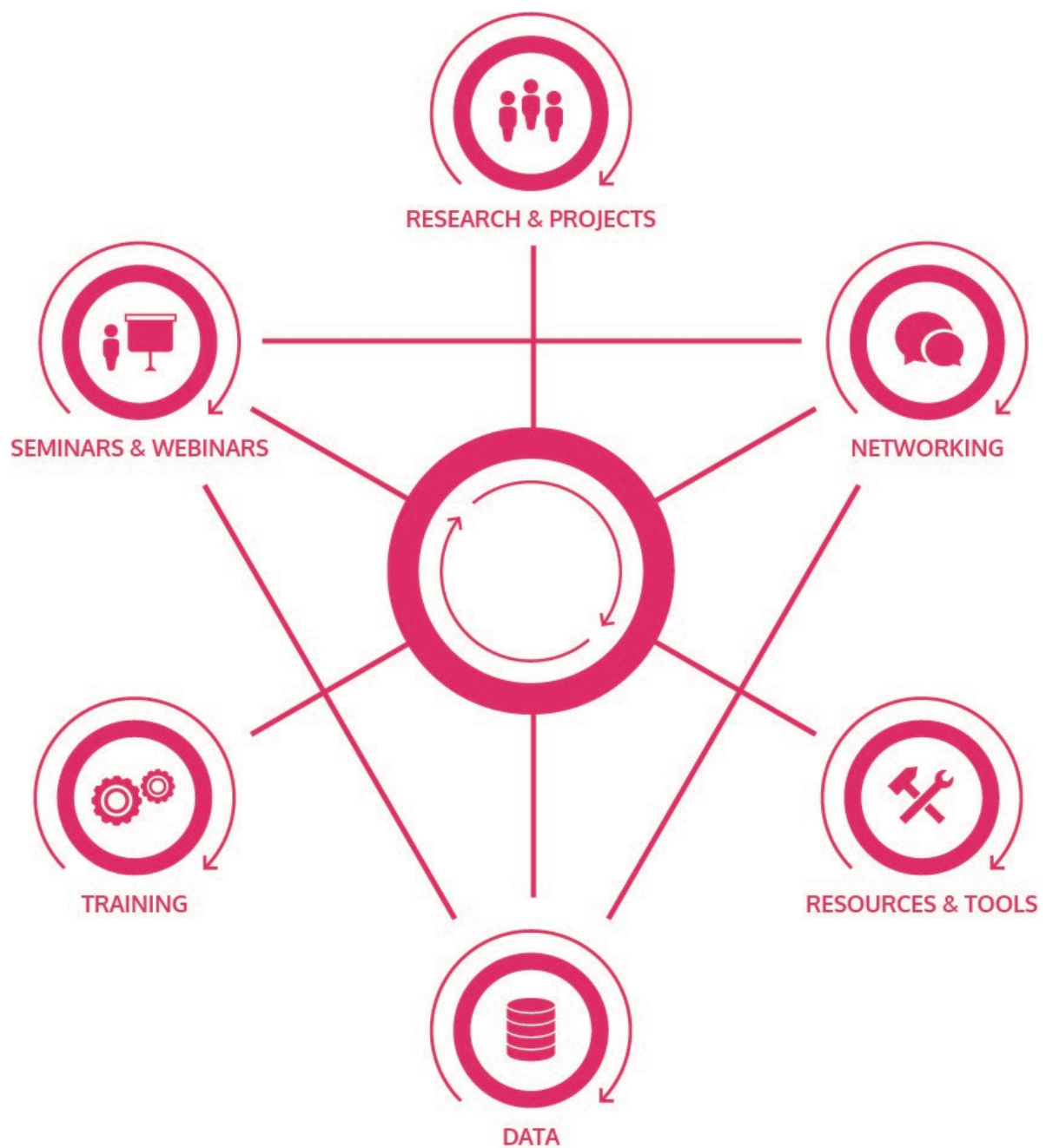
7. Support for database development and management.
8. Delivery of the Advances in LCA course for PhD candidates.
9. Looking for funding calls that could link partners with an interest in current scientific themes (see Appendix for some examples).

Additionally, this Research Strategy will be reviewed and revised by the Academy Group and research institute representatives with each new 3-year stage of the Center.

5 Appendix: Methodological themes

Regarding action point 9, during the development of this Strategy, discussions between research organizations and an examination of the literature suggested a list of methodological themes worth pursuing. This table is intended to excite researchers about some of the themes for which they might find collaborators within the Swedish Life Cycle Center. It is also meant to indicate to industrial partners some methodological issues we would like to explore in case studies with them, to demonstrate to the public the Center's interest in the fundamental scientific issues that underly topics like "circular economy" and "environmental footprints", and to provide the Technical Secretariat with some context for creating research-fomenting activities. It is not intended to prevent researchers from bringing other ideas or proposals to the Center, but to be a more scientifically concrete set of example topics and questions than the current Operational Plan provides.

Themes	Example general questions
Regionalization	How can we improve the geographic resolution of Life Cycle Thinking both in terms of the territoriality of the input data and the disaggregation of Life Cycle Impact Assessment models? How can Geographic Information Systems be better operationalized in a life cycle context?
Consequentialism	How can LCA models respond better to human behavior at the societal scale, and the risk of feedback or rebound effects? How do we integrate agent-based and equilibrium modeling into Life Cycle Inventory?
Circularity and its discontents	Can we standardize approaches to allocation in a circular economy? What is current best practice by Swedish LCA experts in this regard?
Nordic issues	What aspects of living in Scandinavia warrant a uniquely Swedish or Nordic approach to Life Cycle Thinking? Can we get more relevant local Life Cycle Inventory data on Swedish agricultural inputs to consumption? Do impact assessment models adequately reflect the Nordic climate?
Prospective perspectives	What simplifications to inventory acquisition can be made for novel product lacking empirical data? How can future background systems be modelled in relevant ways?
Impact assessment	Can we do better assessments of biodiversity, particulate matter, microplastic and chemical toxicant emissions? How should we assess the temporality of carbon sequestration?
Interpretation	Are there good ways to combine Life Cycle Thinking outputs with the many alternative methods for Multi-Criteria Decision Analysis which improve the presentation of uncertainty? Which methods are appropriate for vetoing suboptimization? How do we avoid erroneous interpretations?
Business integration and communication	How can we strengthen the hand of sustainability champions in business and government to integrate our concerns into decision-making? How can academic science practitioners communicate more relevantly with business and government? How can experts maximize the (non-numerical) learning value of Life Cycle Thinking in practice?



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