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VR 2009:35

# INTERNATIONAL EVALUATION OF PLUS COMPETENCE CENTRE

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at Chalmers

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by

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# 1 Introduction

On Friday October 23<sup>rd</sup> 2009 in the morning, the Centre Director, Anna Lundgren, former Centre Director Thomas Hjertberg and colleagues of the PLUS Competence Centre, briefed the scientific experts of the evaluation team, Sahar Al-Malaika and Piet Lemstra, on the scientific progress and range of projects. The meeting in the afternoon was attended, also, by the generalist evaluators, Anne Anderson and Sybrand van der Zwaag. The afternoon discussion covered organization and management, finance, interaction between industry and university, intellectual property, vision and strategy, student recruitment and educational activities. We thank the all members of the Centre and the VINNOVA representatives for their efforts in setting up instructive and efficient presentations and facilities for the evaluation. The constructive attitude of the Centre in the discussions is appreciated.

The PLUS Centre although similar in form and mission to a VINN Excellence centre is not funded by VINNOVA, but has financial support from Chalmers, industry partners, the regional bodies Västra Götalandsregionen (VGR) and Business Region Göteborg (BRG), and the technical institute SP. The research of the Plus Centre has been carried out at Chalmers, SP and the industry partners. The Centre requested an evaluation under the VINNOVA procedures to help them develop, notably in terms of their ambition to attract long-term Centre funding to support a second phase. The evaluators conducted their task with the aim of providing the stakeholders with constructive evaluation and critique, to assist the Centre reach their goal in a competitive funding environment.

## 2 Research Vision, Strategy and Competence Profile

### Research Program

Overall the current PLUS centre has worked with 11 projects over the period of 4 years in a good, albeit narrow, scientific/techological field probably due to the fact that the projects have been formulated between a limited number of industrial partners and a single research group.

The stated vision of the centre is “to promote growth of plastics for a sustainable society”. The research, however, has focused largely on the improvement of properties of large volume (commodity) plastics such as polyethylene (PE) and polyvinylchloride (PVC). While that field is scientifically rather mature, smaller scale progress can still be important due to the large volume of these bulk polymers.

Only a few projects dealt directly with environmental impact aspects of sustainability. For example, a project that dealt with a challenging and topical issue relating to feed stock from biomass for production of bio-based PE. Even in this case the Centre’s contribution was limited to lobbying and a desk study based on life cycle analysis.

The scope of the current projects does not match the ambitious vision statement of the Centre. For a sustainable internationally recognized Centre, a range of distinctive and challenging scientific themes need to be developed. Furthermore, there should be a proper balance between the scope of the vision statement and the size of a Centre. The size of PLUS does not quite match the vision of creating polymers for a sustainable society.

### Recommendations

- 1 Chalmers along with senior representatives from major stakeholders should initiate a wide ranging discussion to identify the scope and focus in the broad field of sustainability and polymers or the wider area of materials.
- 2 These discussions should clearly identify challenging scientific themes with long-term relevance to industry in which a new centre based in Chalmers can make a distinctive world class contribution
- 3 A distinctive research focus with clearly identified research themes that gives the centre its identity is highly desirable. One such theme could, for example, be based on the current ‘PLUS-Green Plastic’ project on feedstock alternatives which, in principle, could give the Centre a distinctive position in the world, with particular benefits for Sweden if the feedstock was of a Swedish origin.



- 4 For a future Centre to be successful at both national and international levels, it will be essential with a broader and more challenging range of coherently structured scientific themes which would attract a wider range of companies to support such research endeavours of the centre.

#### **Leading International Collaborative, University-Industry Research**

The centre has operated on a regional level and international collaboration has been limited to a few international contacts. As the Centre aimed to play a regional role, there has never been a serious intention to profile the PLUS Centre at an international level

#### **Centre Core Competency - People and Facilities**

On an international scale, the Centre currently has no unique competency due to the departure of the former director who was also the only scientific leader. Although there are clear competencies in the partners, the engagement of other leading scientists, e.g. at Chalmers, appears to have been and be limited.

The centre can draw on a wide range of experimental facilities both at Chalmers and at the partners' laboratories.

#### **Recommendation**

- 5 In order to create a successful future Centre Chalmers should identify and engage a sufficient number of senior academics with complementary and distinctive expertise in the chosen fields.

## 3 Research Program

### **Scientific Leadership - Project Generation, Development and Selection**

The scientific leadership in the past has been too narrowly focused. Whilst the projects have been generated in collaboration with industrial partners in line with their research needs, perhaps their alignment with the mission statement of the centre could have been stronger. The criteria for project selection have not been made clear in the view of the evaluation team.

#### **Recommendation**

- 6 The appointment of a single scientific leader who has sole responsibility for shaping the strategy of the centre is neither sufficient nor appropriate for a centre with aspiration to become world-class and should be avoided new centres yet to be initiated.

### **Research Project Critiques - Science, Methodology and Technological Outcomes**

The science behind the projects to date is sound and mainly application-driven with less focus on innovative contributions to the scientific literature.

#### **Relationship to International Groups**

Limited efforts have been made to establish international networks nor is it clear that any international benchmarking has been undertaken.

#### **Recommendation**

- 7 A future centre should be actively benchmarking itself against other leading international Centres.

### **Overall View - Productivity, Critical Size and Value-added of the Centre**

Some publications have appeared in leading peer reviewed journals but to date the number has been limited.

#### **Recommendation**

- 8 In its current form PLUS is not sustainable as it lacks the scientific power to match its vision. A larger team of scientists need to be engaged with the Centre to achieve its goals.

## 4 Centre Partners

### **Partners' Needs Identification and Articulation**

In PLUS the research programme was developed at the start of the Centre in discussions between the Director and the partners, building on the companies' long term relationships with Chalmers and the Director. Projects were identified which were of interest to partners, notably Borealis and Ineos, which would also be suitable for PhD projects. One of the strengths of PLUS is the strong interest of industry who clearly feel that the research projects are of value to their companies and expressed their appreciation of the PLUS research explicitly during the interview.

### **Partner Participation in Innovation and Technology Translation**

Project partners are actively engaged in the projects and the evaluation team learned that several of the projects would not have been possible without the companies and SP who provide facilities for the research. Most of the projects in the Centre involve only one company. If a new Centre emerges after PLUS, it would be beneficial for new projects to be defined in such a manner that they involve several companies as this would encourage projects which are of longer-term broad industry applicability.

### **Recommendation**

- 9 The projects in a new centre should, preferably, involve more than one partner company.

### **Partner Complement**

The Centre partners are: SP; Ineos; Borealis; Business Region Goteborg (BRG); Region Vastra Gotaland (VGR). TetraPak has also been involved in a project associated with the Centre. The Centre has also engaged with a number of SMEs offering advice, and one of these (Bolon AB) has been actively involved in a project and is utilizing the output in its business. The two major chemical companies, Ineos and Borealis, have had the major role in shaping the Centre's research portfolio. If a new Centre emerges following PLUS it would be advantageous to increase the range of companies involved, both from Sweden and elsewhere, to ensure the global reach of the industry-relevant research challenges being addressed and to increase the funding support for the Centre's activities.

### **Recommendation**

- 10 A new centre should attract a wide range of companies nationally and internationally to support the research endeavours of the centre.

## 5 Organization and Management of the Centre

### **The Board's Role**

During the discussion with the evaluation team the Board described its role as that of a 'sounding board' only. While the Board seemed to have followed the progress in the scientific and other work within PLUS actively and with interest, the board does not seem to have played a strong role in setting and updating the strategy and performance of the centre.

### **Recommendation**

11 For a future centre a stronger strategic role for the board is highly recommended.

### **Management Team Structure, Processes and Performance**

The management structure of the PLUS centre was very lean and essentially consisted of the Scientific Director (Professor Hjertberg) and the Centre Coordinator (Dr Lundgren) who is employed on a part-time basis. This must have placed heavy burdens of these two individuals. With the departure of Professor Hjertberg, there is a lack of scientific leadership. Dr Lundgren now has the role of Centre Director, and has primarily administrative/financial/organizational responsibilities. She would seem to carry a heavy workload and to lack other academic colleagues to engage in Centre management.

### **Recommendation**

12 While minimal number of academic partners involved in PLUS warranted the size and structure of the MT, it also resulted in a highly vulnerable set-up which should be avoided when a new centre is to be established. A larger group of academic staff should be involved in the Management team in a new Centre.

### **International Scientific Advisory Board's Role**

The PLUS centre has chosen not to install an international scientific advisory board.

### **Recommendation**

13 The centre to follow PLUS should have, in an early stage, an international scientific advisory committee to get independent critical advice about the scientific directions and the international interactions/collaborations

### **Relationship to the University and University Units**

The PLUS centre is part of the university, but the involvement of other Chalmers academics can only be considered as marginal from a scientific strategic point of view.

The PhD students would also benefit from a wider set of academic interactions.

### **Recommendation**

14 A novel centre to follow on the existing PLUS centre should have a much broader base within the university in order to establish broad interaction.

### **Communication Strategy and Execution**

The PLUS centre has been very active in arranging communication at the level of projects and combined projects and the students and industrial partners expressed their appreciation for this approach. Strategic discussions about the future of PLUS were said to have taken place in the board, but the evaluation team did not feel that this had led to tangible results as far as the discussion on the future of profile of PLUS is concerned.

## **6 Training Personnel of High Competence**

### **Recruiting and Developing People of International Competence and Experience**

The evaluation team met with five of the Ph.D students from the Centre. We were impressed by their enthusiasm for their studies and for their experience in the Centre. The students particularly valued their extensive interactions with industry partners and invariably expressed an interest in continuing their career in the polymer or polymer related industry.

The recruitment of the PhD students seemed to be confined to Swedish students, and even primarily to (former) students from the research group forming the basis of PLUS. In the context of PLUS only PhD students were hired. No people with external international academic experience were

### **Recommendation**

- 15 A new Centre should make greater efforts to broaden the scope of its recruitment of PhD students and research staff.

### **Mobility of Personnel between University and Industry**

There is a close interaction between the students and the industrial partners. Out of the 4 students graduated so far 2 have joined the industrial partners. The PhD students currently finishing their research project all seemed keen to join the industry. The transfer of the scientific director of PLUS from Chalmers to the industry can be seen as a clear sign of the close cooperation, but also left PLUS in a much weakened state.

### **Gender Perspective**

The gender perspective seems to be well applied with a balanced distribution of male/female students in the current PhD student population. There was no indication that in the context of the PLUS program special actions had to be taken to reach this balanced distribution.

### **Contributions to University Education**

The former scientific director contributed to the educational program of Chalmers curriculum via a number of BSc, MSc and PhD courses, focusing on polymer chemistry, polymer physics, polymer technology and products in a sustainable society. The sustainability aspect was said to be embedded in the polymer science courses.

There is no indication that the courses were substantially modified as a result of the formation of the PLUS centre. The courses seem to have an adequate popularity amongst the students.

**Recommendation**

- 16 In a new centre a recognizable modification of the relevant courses and/or the creation of a dedicated course focusing on high profile aspects is to be recommended to attract more student attention.

## 7 Financial Report

The financial overview of the PLUS centre showed that all projects are ongoing. The financial overview showed a usual degree of over and under spending per project. The reported lack of income from the industrial partners and the lack of spending in the SME activities were attributed to administrative delays and were said not to reflect reality. It is interesting to note that the amount of in-kind support received is larger than the budgeted amount.

### Recommendations for Chalmers

Our recommendations are:

- 1 Chalmers along with senior representatives from major stakeholders should initiate a wide ranging discussion to identify the scope and focus in the broad field of sustainability and polymers or the wider area of materials.
- 2 These discussions should clearly identify challenging scientific themes with long-term relevance to industry in which a new centre based in Chalmers can make a distinctive world class contribution
- 3 A distinctive research focus with clearly identified research themes that gives the centre its identity is highly desirable. One such theme could, for example, be based on the current 'PLUS-Green Plastic' project on feedstock alternatives which, in principle, could give the Centre a distinctive position in the world, with particular benefits for Sweden if the feedstock was of a Swedish origin.
- 4 For a future Centre to be successful at both national and international levels, it will be essential with a broader and more challenging range of coherently structured scientific themes which would attract a wider range of companies to support such research endeavours of the centre.
- 5 In order to create a successful future Centre Chalmers should identify and engage a sufficient number of senior academics with complementary and distinctive expertise in the chosen fields.
- 6 The appointment of a single scientific leader who has sole responsibility for shaping the strategy of the centre is neither sufficient nor appropriate for a centre with aspiration to become world-class and should be avoided new centres yet to be initiated.
- 7 A future centre should be actively benchmarking itself against other leading international Centres.
- 8 In its current form PLUS is not sustainable as it lacks the scientific power to match its vision. A larger team of scientists need to be engaged with the Centre to achieve its goals.



- 9 The projects in a new centre should, preferably, involve more than one partner company.
- 10 A new centre should attract a wide range of companies nationally and internationally to support the research endeavours of the centre.
- 11 For a future centre a stronger strategic role for the board is highly recommended.
- 12 While minimal number of academic partners involved in PLUS warranted the size and structure of the MT, it also resulted in a highly vulnerable set-up which should be avoided when a new centre is to be established. A larger group of academic staff should be involved in the Management team in a new Centre.
- 13 The centre to follow PLUS should have, in an early stage, an international scientific advisory committee to get independent critical advice about the scientific directions and the international interactions/collaborations
- 14 A novel centre to follow on the existing PLUS centre should have a much broader base within the university in order to establish broad interaction.
- 15 A new Centre should make greater efforts to broaden the scope of its recruitment of PhD students and research staff.
- 16 In a new centre a recognizable modification of the relevant courses and/or the creation of a dedicated course focusing on high profile aspects is to be recommended to attract more student attention.

# Appendix A: Guidelines for the Evaluation of the centre PLUS at Chalmers

*Thomas Eriksson - AB Realisator Management Consulting*

*June 2009*

## **The evaluation and its purpose**

The PLUS centre at Chalmers has asked VINNOVA to undertake an evaluation of its activities in the context of VINNOVA VINN Excellence Centre evaluation set up. VINNOVA has accepted the task and has contracted AB Realisator Management Consulting as the Evaluation Process Leader. An international evaluation team will be appointed by AB Realisator with the task to evaluate the centre based on the initial four years of operation. Their study will result in an evaluation report to VINNOVA that should shed light on:

- The scientific potential of the centre both from a quality/capacity point of view and the scientific direction perspective
- The establishment of the centre e.g. organizational matters, cooperation, legal aspects, etc
- Conditions for a successful realization of the next phase
- Recommendations to strengthen the centre

In the long run the goal is that the centre should fulfill the VINNOVA VINN Excellence Success Criteria, see Appendix 1.

## **Background**

### **Background PLUS competence centre**

The origin of PLUS comes from a project aimed at developing the petrochemical centre in Stenungsund, Sweden. Stenungsund municipality, the petrochemical companies in Stenungsund, Business Region Goteborg (BRG), Western Region Göteborg (VGR) and Invest in Sweden Agency (ISA), initiated that project, named "Petrokemiprojektet". This was the year 2003. At an early stage it was recognized that increased competence is essential to be successful when new companies should decide on new locations. Thus, initiation of a polymer development centre was given high

priority by these actors in Stenungsund. To assist in this process Chalmers University was contacted and Professor Thomas Hjertberg was involved.

Research in the environmental area is one of the areas that Chalmers is working to expand. For VGR and BRG sustainable industrial development is one of the high priority fields. At an early stage the parties therefore decided that development of sustainable plastics should be the overall theme of this competence centre. After an unsuccessful attempt to get financial support from VINNOVA via the VinnVäxt program VGR decided at the end of 2003 to support with conditional money. This led Hydro Polymers (now Ineos ChlorVinyls), Borealis and BRG to join and thereafter also extra support was obtained from SP Technical Research Institute of Sweden (SP) and Chalmers University. The PLUS Competence Centre was formed in 2004 and the activities within PLUS should foster growth under the title "Polymers in a sustainable society". PLUS is hosted by Chalmers University.

The overall aim of PLUS is to increase the competence base within the polymer field for the petrochemical centre in Stenungsund. The aim has not changed since the beginning and PLUS work towards 3 main activities.

- 1 A research program
- 2 Development projects for SMEs
- 3 Education and Information

PhD students run the research programs and collaboration are conducted between the industry, Chalmers and SP. The development projects for SMEs are for SMEs interested to develop new products/processes where the environmental aspect is important. Education is conducted at different levels including courses in the University master programs and courses for the industry. Information of plastics directed towards the public and the political sphere is also highly prioritised and has for instance involved TV appearances.

PLUS generally shows a turnover of 14 MSEK where 8 MSEK is cash contribution from the PLUS parties, i.e. Chalmers University, SP, BRG, VGR and the industrial partners Borealis and Ineos ChlorVinyls (former Hydro Polymers). PLUS has no cash contribution from the Swedish Governmental Agency for Innovation Systems, VINNOVA.

The partners of PLUS all agreed at an early stage that the activities in PLUS must be of a long-term nature in order to have the intended impact. The intention has been fulfilled as all partners are still members of PLUS. At present PLUS is focusing at establishing a new financial contract (for 2010-2012).

The PLUS Centre deals both with early stage industrial research closely related to basic research and projects that requires a substantial engagement from the industrial and/or public partners. The overall objective with PLUS is to foster growth for a sustainable society, which aim to promote sustainable growth in Sweden and secure high qualitative research in important areas. The research activities involve intense collaboration between the participating actors. The interactions are working very well. The department where PLUS is situated has a long history of cooperation with the industry and several PhDs are later on employed by them.

### **Evaluation background**

PLUS has not been evaluated before so this is the first evaluation and it occurs during the last year of operation in this second stage. Furthermore VINNOVA is no financial contributor to PLUS. The reason for PLUS to be evaluated by VINNOVA is to “grade” its way of working and “rank” the scientific quality of its work. The evaluation is also seen as a contribution and help for the centre to focus ahead on 2010 and forward. PLUS is as said earlier at its final year and discussions for a continuation of PLUS has started aiming at a new 3-5 year period/contact. Several pieces are missing at this stage. First PLUS is looking for a new scientific leader and the recruitment process is ongoing. The choice of new scientific leader will of course influence PLUS strategic decisions such as aim, partners and projects. Also the financial crisis makes it difficult for companies to commit to PLUS.

A number of industrial companies and/or public services together with Chalmers and a research institute constitute the parties of the PLUS Centre. The parties contribute jointly to the Centre’s research programme, financially or in the form of active work. Their collaboration and the financing are manifested in two PLUS contracts for the periods 2004-06 and 2007-09, respectively. The evaluation report should serve as a platform for activities for 2010- 12.

### **The evaluation team**

A team of four international experts will evaluate the PLUS centre. Two of the experts will have the competence and the task to evaluate the centre from a scientific point of view. The two other persons in the team will have experience from similar programmes for university – industry research collaboration. These “generalist” experts will look at the centre from a general point of view i.e. from other aspects than the scientific perspective. This means that the evaluation team will assess the centre from a number of perspectives both scientific as well as organisational, etc. The PLUS centre

has suggested up to 5 suitable scientific experts. With that list in mind AB Realisator will decide on whom to invite.

## **The task of the evaluators**

This first evaluation of the PLUS centre will be carried out after approximately four years of running. Its primary purpose is to evaluate the new established organisation of the centre and the initial activities to establish the research programme in a centre format. Also the evaluation will review progress of scientific and industrial efforts, recognising the time the centre has been up and running. The evaluators will form an opinion concerning the approach and measures taken so far by the centre to judge the potential for their long-term development towards a successful future. Evaluators may offer suggestions for remedial action to enhance the prospects for centre success.

As a basis for the evaluation of the PLUS centre the VINNOVA success criteria for its VINN Excellence Centres will be used, see Appendix 1). Centres are asked to prepare a Status Report according to the guidelines in Appendix 2.

The evaluation team will make the evaluation in the context of the success criteria.

The scientific experts on the evaluation team will review the centre Status Report sections:

2. Research Area, Competence Profile and Critical Size
3. Centre Partners (from the point of view of research contribution)
4. Research Program

They will offer their perspective on the research in the context of the Vision, Mission and Strategy and financial aspects with respect to support of research agenda.

The "generalist" experts on the evaluation team will review the Status Report sections:

5. Financial Report for Stage 1
6. Organisation and Management of the Centre.
7. Personnel of High Competence

and

8. Centre Partners (from the point of view of organisational effectiveness)

They will offer their perspective on the Centre organisation in the context of the Vision, Mission and Strategy. They will also comment on the organisation of the report and the site visit.

## **Organisation of the evaluation**

AB Realisator decides the composition of the evaluation team. The evaluation team itself decides on the distribution of work among its members.

AB Realisator will distribute the Status Report from the Centre to all members of the evaluation team and VINNOVA not later than one month prior to the evaluation.

The interview will be divided into two sessions, one where the scientific experts meet parties from the centre (generalist experts will not be present) and one session where the “generalist” experts together with the scientific experts meet parties from the centre. During lunch, i.e. between these two sessions, the evaluation team will also meet with up to 10 PhD students in the centre.

The evaluation team will meet at an introductory meeting at 9- 11:00 p.m. Thursday October 22, 2009 in Gothenburg. The agenda for Friday October 23, 2009 is:

09:00- 11:00 Scientific interview session

11:00- 12:15 Lunch

12:15- 12:45 Meeting with up to maximum 10 PhD students

12:45- 13:00 Preparation for the generalist interview session

13:00- 15:00 Generalist interview session

15:00- 23:00 Report writing

The goal is that the first draft of the evaluation report should be finished the same evening as the interview is performed. The evaluators have fulfilled their mission when the report is completed. The evaluation report is due approximately 5 weeks after the interview sessions.

During the site visit the evaluation team is interested in meeting:

- - the Centre Director
- - the Chairman of the Centre Board of Directors and
- - representatives from the industrial and/or public partners
- - university staff incl. representatives from the Vice-Chancellor's office

- - research leaders and/or program directors active within the Centre
- - doctoral students.

All staff besides the evaluators and the centre representatives that will participate in at the interview sessions, e.g. VINNOVA representatives, will act as administrators and should not take active part in the evaluation, but can add information during work sessions.

## **Centre arrangements in connection to the evaluation**

The PLUS centre is asked to propose five scientific experts for the evaluation and send the suggestions to VINNOVA not later than September 21, 12:00, 2009. It is important that the centre can guarantee no conflict of interest with the proposed evaluators.

The basic documentation, in principle the Status Report to the evaluation team, from each of the Centres will be distributed by VINNOVA to the members of the evaluation team not later than 4 weeks prior to the evaluation. The template that should be used is presented in Appendix 2.

The report should be submitted electronically (pdf-files) to the VINNOVA representative at the e-mail address [thomas.eriksson@realisator.se](mailto:thomas.eriksson@realisator.se) and be available not later than September 21, 12:00 a.m. 2009.

Furthermore the centres should:

- book location for the interview sessions
- invite centre representatives to the interview sessions
- inform AB Realisator on the address to the location
- arrange lunch for the evaluation team and the administrative staff (chamber separee)
- arrange so that the evaluation team can meet with up to 10 PhD students during lunch coffee, preferably in the lunch location.

It is recommended that the centre:

- choose a location that easily can host the participants
- that tables and chairs are positioned in a U-shape so that all participants easily can see each other
- distributes hand-outs of the slides that are planned to be shown during the interview sessions
- prepare name- plates that each participant can place in front of her/him in order to ease the understanding of whom is participating

- prepare a separate presentation to each interview session that will take twenty minutes to hold if not interrupted. However, due to the task of the evaluators and the limited time available it will probably be the case that the evaluators interrupt the presentation for questions and initiates discussions.

Finally the centre leader should confidentially review, with respect to facts, the first draft of the evaluation report that will be sent to the centre leader not later than October 30, 12:00 a.m. Response on facts findings should be delivered not later November 6, 12:00 a.m.

## **Report of the evaluation team**

The work of the evaluation team shall result in one report on the PLUS centre. The report should be written in consensus by the evaluation team and sent to the VINNOVA representative. The evaluation team shall be unanimous in its conclusions.

All financiers of the centre appreciate a discussion on priorities of actions to be taken by each of them as well as by the centre, both in terms of financial support and of more structural matters.

## **Handling and distribution of the evaluation report**

The report from the evaluation team will be presented to VINNOVA. The report will also be openly circulated to the PLUS centre and, on request, to any other agency or person who have expressed an interest in this type of information. The Swedish scientific community is used to outspoken international evaluation reports.

## **Remuneration of the evaluators**

The board of PLUS has decided to support the evaluation with 100 kSEK that should cover hotel and travel expenses as well as remuneration for the work undertaken by the evaluators.



## **Appendix 1- Success Criteria for the PLUS Centre**

In brief the PLUS centre strive towards the same success criteria that have been developed by VINNOVA and the VINN Excellence Centres. Such a successful centre is characterised by the following:

- Promoting sustainable growth by ensuring that new knowledge and new technological developments generated lead to new products, processes and services.
- Leading international research in different fields in collaboration between the private and public sectors, universities and colleges, research institutes and other organisations which conduct research.
- Research programmes are set up and carried out in collaboration between the various participants in order to solve key issues.
- Geographical programmes where the majority of work is conducted at a university or a college to achieve a critical size and interaction between research, post-graduate education and graduate education.
- Long-term implementation with comprehensive evaluations prior to new agreement periods to secure long-term effects and international excellence.
- Long-term collaborative finance from private and public sectors, the university/college and financing governmental agencies, to be able to recruit, develop and keep people with leading international competence.
- The activities are led by a manager and a board where the participants from the public and private sectors hold the majority in order to secure the direction of the Centres towards the requirements of the private and public sectors, i.e. needs-driven research.
- Set up in innovation environments with effective innovation operations so that strong research and innovation milieus can be created.

When completing the evaluation it will also be considered:

- The gender perspective in the research programme; and
- Equality aspects and active promotion of an equal balance.

## **Appendix 2, Instructions for Centre Report to the Evaluation Team**

The Centre will submit a report to AB Realisator, electronically (pdf-files). AB Realisator will forward the report to the evaluation team. Guidelines for report contents and length follow. Facts about the Centre are to be compiled in section 10. It is recommended that this data be referred in the text in other relevant sections so as to give context and appropriate emphasis to the data.

### **0. Summary (1 page)**

- Progress and prospects of the Centre, highlights, breakthroughs, etc.

### **1. Long-term Vision, Mission and Strategy (1 page)**

- Provide a ten-year perspective on the Vision, Mission and Strategy of the Centre in the context of the Success Criteria's, see Appendix 1.

### **2. Research Area, Competence Profile and Critical Size (3 pages)**

- Briefly describe the core competency of the Centre's research team both in terms of research competency (e.g. we have strength in molecular biology, metabolomics and large scale computation) and personnel.
- Describe the facilities that the Centre has developed or plans to develop to support the program.
- Describe the personnel and facilities available to the Centre (through collaboration within or beyond the university) that contribute to establishing competence profile for the research of the Centre.
- State the position of the Centre in relation to internationally leading groups.
- Comment on new types of collaborations since establishing the Centre.
- Describe the value added being a Centre compared to other ways of research collaboration.
- Comment on the Centre with respect to "critical size".

### **3. Centre Partners - Companies and public service partners (3 pages)**

- For each of the partners describe:
  - their corporate profile (number of employees, main products, location of operations etc.).
  - how their business interests are aligned with the Centre research efforts
  - how they interact with the Centre (including planning, personnel and facilities).
- Concerning the overall strategy and considering the Centre as a whole:
  - describe the way in which key issues are identified by partners to stimulate needs-driven research.

- describe the mechanisms for innovation and translation of technology into new products, processes, and services.
- describe the measures taken to achieve strong links and integration between academia and companies/public services, and among companies/public services.

#### **4. Research Program (5 pages)**

- Provide an overview of the research program.
- Provide brief descriptions of the research projects (50-75 words each). In addition to basic science and methodology, describe the need the research addresses, the question to be answered and the technological objectives.
- Provide a summary statement concerning research productivity. (Particulars of research output are to be listed in the Appendices under Publications and Presentations Activity and International Activity.).

#### **5. Financial Report for Stage 1 (2 pages)**

- Discuss any concerns regarding financing matters.
- Describe existing sources of non-Centre funds supporting related research.

#### **6. Organisation and Management of the Centre (3 pages)**

- Describe the role and activities of the:
  - Board of Directors.
  - Centre Director.
  - Management Team
  - International Scientific Advisory Board.
- Comment on the scientific leadership of the Centre.
- Describe the process of:
  - idea generation.
  - idea development.
  - project selection.
  - project planning.
  - project review.
- What steps are taken to stimulate innovation processes from ideas/results to products and services?
- Describe the status and role of the Centre vis-à-vis the:
  - university organisational units.
  - central administration.
  - the Faculty.
  - other Centres.
- Comment on things that work well and things that don't.

- What steps are taken to communicate to Centre participants and partners?
- Describe measures taken to stimulate mutual personal mobility between the industrial/public services partners and academic milieus.
- Describe measures taken to provide equality of opportunity, particularly but not only, from a gender perspective.

#### **7. Personnel of High Competence (1 page)**

- Describe the contribution of the Centre to university education (graduate and undergraduate): e.g. courses taught, seminars given, students supervised other than those already listed under research projects, etc.
- What measures have been taken to recruit, develop and keep people with leading international competence?
- What is the percentage of students associated with the Centre who's first degree is from:
  - another University?
  - outside Sweden?
- What measures have been taken to provide opportunities for students to travel or study abroad?

#### **8. Plans for Development (1 page)**

- Describe the plan for development of the Centre over the next three years (2010- 12) in relation to the long-term objectives.

#### **9. Further information (1 page)**

- Please provide information of particular interest to the evaluation team that has not been covered in any other section of the guidelines.

#### **10. Facts about the Centre**

- CV* in summary of the Centre Director
- Centre Partners*  
TABLE 1: List Centre Partners (Companies/public sector units), the name and position of the key contact)
- Board of Directors*  
TABLE 2: List the name, position, company, location of the members of the Board of Directors
- Management Team*  
TABLE 3: List the name, position in the University, role on the team for the persons in the Management Team
- International Scientific Advisory Board*  
TABLE 4: List the name, position, university/company, location for the members of the International Scientific Advisory Board
- Research Program*  
TABLE 5: Research Projects and Staff (for each project: project title,

project leader, staff and student names, and person-years by year (include company and public sector personnel also)).

g *Publication and Presentation Activity*

TABLE 6: List publications, patents, theses, posters, presentations, invited lectures, etc. Also include other closely related work funded by other means, indicating that other funding was used by an asterisk\*.

h *International Activity*

TABLE 7: List collaborations with international researchers, visits outside Sweden (conferences, seminars, university visits, etc.), and foreign visitors to the Centre. Also include other closely related work funded by other means, indicating that other funding was used by an asterisk\*.

i *Websites*

Provide relevant websites for the Centre, the University, research partners, research collaborators, etc. Access to internal website of the Centre (normally password protected) should be provided to the evaluation team for a one-month period leading up to and three weeks after the evaluation.

## 11. Financial Information

The financial statements should give information on resources available, how the resources are used, and hence give a feeling for large- grained and small- grained activities at the Centre and how they are structured. Please use the template in Appendix 3 or in the attached Excel file “Financial Report”.

- *Table 8 Overall Resources Available*

List all the resources available for the Centre, affiliation of the stakeholder, in kind as well as cash contribution and its sum. This is to give an understanding of the size of the Centre, its main stakeholders, the proportions of cash and in-kind contributions, major deviations from original thoughts (i.e. the budget), etc.

- *Table 9 Project Expenditures*

List all expenditures for the Centre divided into projects e.g. Management of Centre, Communication, Reserved for New Projects, each individual research project (subprojects included) within the Centre and its corresponding financing of in-kind and cash. This is to understand if the Centre deals with a few large projects, many small projects and what the balance looks like; how the cash contribution is distributed; etc. Preferably the sum of Project expenditures should equal the sum of Table 8 Overall Resources Available. However, there may be some carry forward from year to year.

- *Table 10 Overall Expenditures*  
List all expenditures for the Centre at an aggregated level (Salaries; External services; Material, Running costs etc.; Other; and Overhead costs.) Differentiate between in-kind and cash expenditures. This is to give a feeling for the nature of the Centre. Most frequently salaries are the dominating expenditure but not always. Also the value of in-kind contribution to Material, Running costs, etc. is of interest. Of course major deviations from budget will be noticed. Preferably the sum of Overall expenditures should equal the sum of Table 1 Overall Resources Available.
- *Table 11a Research Personnel - Financing*  
List all personnel working in the Centre both on in-kind and cash basis. Preferably they can be grouped in order to use the information in other parts of the report. The degree of activity in the Centre on an annual basis should be given together (person years). With the corresponding economic value of that activity, in-kind and/ or cash.
- *Table 11b Research Personnel - Description*  
List all personnel working in the Centre in the same order as in table 11a. The affiliation, category title, university degree, year of degree, and university where the degree was earned should be listed for each individual.  
The information in Table 11a and b is collected to give an understanding of the structure of the Centre; the engagement of key personnel, the number of personnel for whom the Centre constitutes their major activity, the number of personnel where the Centre constitutes just a few percent of her/ his overall activities; the university degree of different categories working in the Centre; the present base for recruitment of personnel (international or local); the hourly rate for in-kind contribution; etc. Preferably the sum of the budget and outcome, respectively, of the in-kind and cash contribution of Research Personnel should equal the sum of Salaries in Table 10 Overall expenditures
- *Table 12 Related Research Grants*  
List available resources that are closely related to the CRC i.e. all grants granted, applied for and under preparation – project title, total amount applied for, amount coming to Centre researchers, duration of project, funding source, date of application and any comment you might have. This is to understand in what context the Centre is operating and what resources that are, broadly speaking, available for partners joining the Centre.

## Appendix 3, Templates for the Financial Statements

VINN Excellence Centre:
Berzelii Centre:
Dnr:
Year 1: 200x-xx-xx - - 200x-xx-xx
Year 2: 200x-xx-xx - - 200x-xx-xx

### Table T8: Overall resources available (cash and in kind)

This table should present the overall resources available (cash as well as in-kind) for center activities, one row for each financial source.

Affiliation	Year 1						Year 2						Summary Stage 1					
	Budget (kSEK)			Outcome (kSEK)			Budget (kSEK)			Outcome (kSEK)			Budget (kSEK)			Outcome (kSEK)		
	Cash	In kind	Total	Cash	In kind	Total	Cash	In kind	Total	Cash	In kind	Total	Cash	In kind	Total	Cash	In kind	Total
VINNOVA																		
University																		
<i>Industrial &amp; Public Partners</i>																		
Partner A																		
Partner B																		
Part.....																		
Sum																		

**VINN Excellence Centre:**  
**Berzelii Centre:**  
**Dnr:**  
**Year 1:** 200x-xx-xx - - 200x-xx-xx  
**Year 2:** 200x-xx-xx - - 200x-xx-xx

## Table 9: Overall Expenditures

List all expenses for the centre at an aggregated level.

	Year 1						Year 2					
	Budget (kSEK)			Outcome (kSEK)			Budget (kSEK)			Outcome (kSEK)		
	Cash	In kind	Total	Cash	In kind	Total	Cash	In kind	Total	Cash	In kind	Total
Salaries (from "Staff sheet")												
External services												
Equipment												
Material, running costs etc.												
Travel												
Other												
Overhead costs												

Sum

	Summary Stage 1					
	Budget (kSEK)			Outcome (kSEK)		
	Cash	In kind	Total	Cash	In kind	Total
Salaries (from "Staff sheet")						
External services						
Equipment						
Material, running costs etc.						
Travel						
Other						
Overhead costs						

Sum









# Appendix B: The Evaluation Team

## **Generalist Experts**

Professor **Anne H Anderson**, (chairman of the evaluation team)  
University of Dundee  
SCOTLAND

Professor **Sybrand van der Zwaag**  
Delft University of Technology  
THE NETHERLANDS

## **Scientific Evaluators**

Professor **Piet Lemstra**  
Eindhoven University of Technology  
THE NETHERLANDS

Dr **Sahar Al-Malaika**  
Aston University  
ENGLAND

## Appendix C: List of participants at the interview sessions

In the beginning of each interview session a list was sent around for the participants to write their name and affiliation. Below is presented the names and affiliations given on these lists. For different reasons all participants did not always write their name on the list, which means that some people participating at the interviews, are not found below.

When key persons that participated are missing on the list their name and affiliation has been added in *italic*, normally to show that people from industry were present at the interview.

### PLUS: Participants during the scientific interview session; 2009-10-23

#### *Centre Representatives*

<i>Anna Lundgren</i>	<i>Centre director</i>	<i>Chalmers</i>
Hans Eklind	Development manager	Borealis
Christian Ekberg	Prof., Vice chair	Chalmers
Thomas Hjertberg	Scientific leader	Borealis AB
Villgot Englund	Development engineer	Borealis
Magnus Palmlöf	Proj.leader PLUS-Pipe	Borealis
Bernt-Åke Sultan		Borealis
Harald Jacobsen	Chief Engineer	Ineos
Robert Onsander	Project Mgr	Business Region Göteborg
Thomas Gevert	Enhetschef	SP
Erland Johnson	Forskningschef	SP Bygg& Mekanik
Anna Jansson	Forskare	SP Kemi- och materialteknik
Ignacy Jacobowicz	Forskare	SP
NzdanehYarahmadi	Scientist	SP
Krister Holmberg	Head of Department	Chalmers
Mats Andersson	Prof, Examiner	Chalmers
Mikael Rigdahl	Professor (examina)	Chalmers, Polymeric materials
Kristian Thörnblom	PhD student PIPE Project	Chalmers/SP
Karin Sterky	PhD- student	Chalmers
Susanne Nilsson	PhD student	Chalmers
Linus Karlsson	PhD student	Chalmers
Helena Andersson	Assistant	Chalmers

#### *Evaluation Team*

Piet Lemstra	Evaluator	Eindhoven Univ of Technology
Sahar Al-Malaika	Evaluator	Aston University

#### *VINNOVA representatives*

Thomas Eriksson	Evaluation Manager	AB Realisator
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**PLUS: Participants during the generalist interview session;  
2009-10-23**

*Centre Representatives*

<i>Anna Lundgren</i>	<i>Centre director</i>	<i>Chalmers</i>
Hans Eklind	Development manager	Borealis
Johan Carlsten	V President	Chalmers
Christian Ekberg	Prof., Vice chair	Chalmers
Krister Holmberg	Head of Department	Chalmers
Thomas Hjertberg	Scientific leader	Borealis AB
Villgot Englund	Development engineer	Borealis
Magnus Palmlöf	Proj.leader, PLUS- Pipe	Borealis
Bernt Åke Sultan		Borealis
Harald Jacobsen	Chief Engineer	Ineos
Helena L Nilsson	Director R&D	Region Västra Götaland
Robert Onsander	Project Mgr	Business Region Göteborg
Thomas Gevert	Enhetschef	SP
Erland Johnson	Forskningschef	SP Bygg& Mekanik
Anna Jansson	Forskare	SP Kemi- och mtrl. Tekn
Kristian Thörnblom	PhD student PIPE Project	Chalmers/SP
Mats Andersson	Prof, Examiner	Chalmers
Karin Sterky	PhD- student	Chalmers
Helena Andersson	Assistant	Chalmers
Susanne Nilsson	PhD student	Chalmers
Linus Karlsson	PhD student	Chalmers

*Evaluation Team*

Anne H Anderson	Evaluator	Univ of Dundee
Sybrand van der Zwaag	Evaluator	Delft Univ of Technology
Piet Lemstra	Evaluator	Eindhoven University of Technology
Sahar Al-Malaika	Evaluator	Aston University

*VINNOVA representatives*

Thomas Eriksson	Evaluation Manager	AB Realisator
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# VINNOVA's publications

December 2009

See [www.VINNOVA.se](http://www.VINNOVA.se) for more information

## VINNOVA Analysis VA 2009:

- 01 Svenska tekniker 1620 - 1920
- 02 Effekter av statligt stöd till fordonsforskning - Betydelsen av forskning och förnyelse för den svenska fordonsindustrins konkurrenskraft. *For brief version in Swedish and English see VA 2009:11 and VA 2009:12*
- 03 Evaluation of SIBED. Sweden - Israeli test bed program for IT applications. *Only available as PDF*
- 04 Swedish possibilities within Tissue Engineering and Regenerative Medicine
- 05 Sverige och FP7 - Rapportering av det svenska deltagandet i EUs sjunde ramprogram för forskning och teknisk utveckling. *Only available as PDF*
- 06 Hetast på marknaden - Solenergi kan bli en av världens största industrier
- 07 Var ligger horisonten? - Stor potential men stora utmaningar för vägkraften
- 08 Vindkraften tar fart - En strukturell revolution?
- 09 Mer raffinerade produkter - Vedbaserade bioraffinaderier höjer kilovärdet på trädet
- 10 Förnybara energikällor - Hela elmarknaden i förändring
- 11 Sammanfattning - Effekter av statligt stöd till fordonsforskning. *Brief version of VA 2009:02, for brief version in English see VA 2009:12*
- 12 Summary - Impact of Government Support to Automotive Research. *Brief version in English of VA 2009:02, for brief version in Swedish see VA 2009:11*
- 13 Singapore - Aiming to create the Biopolis of Asia
- 14 Fight the Crisis with Research and Innovation? Additional public investment in research and innovation for sustainable recovery from the crisis.
- 15 Life Science Research and Development in the United States of America - An overview from the federal perspective. *Only available as PDF*
- 16 Two of the "new" Sciences - Nanomedicine and Systems Biology in the United States. *Only available as PDF*

- 17 Priority-setting in the European Research Framework Programme
- 18 Internationellt jämförande studie av innovationssystem inom läkemedel, bioteknik och medicinteknik
- 19 Investering i hälsa - Hälsoekonomiska effekter av forskning inom medicinsk teknik och innovativa livsmedel
- 20 Analysis of Chain-linked Effects of Public Policy - Effects on research and industry in Swedish life sciences within innovative food and medical technology
- 21 Research Priorities and Priority-setting in China
- 22 Priority-Setting in U.S. Science Policies
- 23 Priority-Setting in Japanese Research and Innovation Policy

## VINNOVA Information VI 2009:

- 02 Forskning om chefskap. Presentation av projekten inom utlysningen Chefskap; förutsättningar, former och resultat. *For English version see VI 2009:03*
- 03 Research on the managerial tasks: condition, ways of working and results. *Finns endast som PDF. For Swedish version see VI 2009:02*
- 04 Högskolan utmaningar som motor för innovation och tillväxt - 24-25 september 2008
- 05 VINNOVA news
- 06 Årsredovisning 2008
- 07 Innovationer för hållbar tillväxt. *For English version see VI 2009:08*
- 08 Innovations for sustainable Growth. *For Swedish version see VI 2009:07*
- 09 Forska&Väx.
- 10 Ungdomar utan utbildning - Tillväxtseminarium i Stockholm 4 mars 2009
- 11 Cutting Edge - Swedish research for growth
- 12 Mobilitet, mobil kommunikation och bredband - Branschforskningsprogram för IT & telekom. Projektkatalog
- 13 Forskning och innovation för hållbar tillväxt

## VINNOVA Policy VP 2009:

- 01 TRANSAMS uppföljning av "Nationell strategi för transportrelaterad FUD" åren 2005 - 2007. Två uppföljningar - en för 2005 och en för 2006 - 2007. *Only available as PDF*
- 02 VINNOVAs internationella strategi - att främja hållbar tillväxt i Sverige genom internationellt forsknings- och innovationssamarbete

## VINNOVA Report VR 2009:

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- 03 First Evaluation of the Berzelii Centra Programme and its centres EXSELENT, UCFB, Uppsala Berzelii & SBI Berzelii
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- 10 Utmaningar och kunskapsbehov - Om innovation, ledning och organisering i nio olika tjänsteföretag. *Only available as PDF*
- 11 De två kulturerna på Internet - En utmaning för företag, myndigheter och organisationer. Huvudrapport
- 12 Uppföljning av VINN NU-företag

- 13 Kartläggning av svensk FoU inom området IT och miljö - med fokus på teknikens indirekta och systemmässiga effekter. *Only available as PDF*
- 14 Forska&Väx - Hållbar tillväxt genom forskning och utveckling i Små- och Medelstora Företag
- 15 Tjänsteinnovationer för tillväxt
- 16 Behovet av genusperspektiv - om innovation, hållbar tillväxt och jämställdhet. Utvärdering. *Only available as PDF*
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- 30 Inomhusskidbacke i Lindvallen, Sälen. *Only available as PDF*
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- 11 DYNAMO 2 i halvtid - Rapport från VINNOVAs konferens på Ulfsunda slott 10 - 11 april 2008
- 12 VINNVÄXT II - Generalist and Specialist Evaluation of process and knowledge development 2004 - 2007
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- 15 Chefskapets former och resultat. Två kunskapsöversikter om arbetsplatsens ledarskap
- 16 NRA Security - Swedish industry proposal for a National Research Agenda for security
- 17 University strategies for knowledge transfer and commercialisation - An overview based on peer reviews at 24 Swedish universities 2006
- 18 Värda idéerna! - Trots många framgångsrika projekt inom vård och omsorg skapas inte varaktiga effekter. Varför förvaltas och utnyttjas inte idéerna?
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VINNOVA's mission is to promote sustainable growth  
by funding needs-driven research  
and developing effective innovation systems

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VERKET FÖR INNOVATIONSSYSTEM – SWEDISH GOVERNMENTAL AGENCY FOR INNOVATION SYSTEMS

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