Introducing Strategic Sustainable Development in a business incubator

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Abstract: This qualitative action research explores integration of Strategic Sustainable Development (SSD) at Inova business incubator (Karlstad, Sweden). Researchers and incubator agreed that planning with sustainability in mind at a very early stage of company development may have important impacts on future business success and societal welfare.

The objective was to answer how SSD could be integrated into the processes at Inova and how Inova staff's and entrepreneurs' understanding of sustainability demonstrably evolve after exposure to SSD.

Apart from general research methods, SSD methods and tools were used with three entrepreneurs and business incubator staff. The Five Level Framework for Planning and Decision-making in complex systems and the Templates for Sustainable Product Development approach were central to the study.

Inova staff and entrepreneurs began to develop; an understanding of business' dependence on and relationship to broader societal and ecological systems; and an ability to use backcasting from the basic socio-ecological principles of sustainability in business planning. In turn they experienced an increased capacity to identify sustainability related business risks and opportunities.

A new incubation process integrating SSD was created. Although the outcome is specific to Inova, it is general enough for other assistance organizations to gain insight from. In conclusion, SSD should be integrated as early as possible in the business planning of start up companies. Organizations with a mission of assisting entrepreneurs have an important role to play

In further research it is recommended that visionary sustainability leaders are identified and tracked from start up.

Keywords: sustainability, entrepreneurship, business incubator, TSPD, strategic sustainable development

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Statement of Contribution

This thesis was written in a truly collaborative way with each of the three team members bringing his/her respective strengths and perspectives to the work.

Research design

Throughout the entire research, core ideas regarding research design, research questions and methods emerged through reflective dialogue in daily or weekly group meetings. We each took turns running both internal and external meetings. In order to let each one of us focus more deeply on a specific area, the overall responsibility of the three main processes in our research work was divided accordingly: Heidi oversaw work with the incubator, Jonas with the companies, and Viktor with the thesis writing.

Carrying out methods

Each member participated in literature review. Viktor and Jonas carried out the survey and developed the sustainability learning curve tool while Heidi focused on the use of the Templates for Sustainable Product Development (TSPDs) for the incubator strategy workshops. All three of us contributed in providing the sustainability experts' replies in the TSPDs for the companies which Jonas summarized, in Swedish. Jonas also produced all three for the TSPDs final reports for the three companies. Together we shared responsibility for conducting interviews and observations; compiling, coding and analyzing data.

Written report duties

The planning and outlining of the thesis was carried out in our group meetings. Viktor took the lead in establishing scientific rigour and flow between the method, results and conclusion sections. Viktor crafted the figures, graphs and tables. Heidi coordinated the writing of the introduction and SSD tools section Methods. Throughout the process we all gave comments, suggestions, and edits. The final editing, standardizing the language flow and consistency was done by Heidi, the team member with best journalistic competencies.

Presentation of results

At different points we had the opportunity to present our project's progress. This role was divided equally among us.

The experience of writing a group thesis deepened both our knowledge and perspective. We realize and appreciate that such a co-creation reaches far beyond what a single individual can accomplish.

Karlskrona, June 2007

A handwritten signature in dark ink, reading "Heidi Blankenship". The script is cursive and fluid, with the first name "Heidi" written in a slightly larger, more prominent hand than the last name.

Heidi Blankenship

A handwritten signature in dark ink, reading "Viktor Kulhavý". The signature is highly stylized and cursive, with a large, sweeping "K" and a long, horizontal stroke extending from the end.

Viktor Kulhavý

A handwritten signature in dark ink, reading "Jonas Lagneryd". The signature is cursive and somewhat slanted, with the first name "Jonas" written in a slightly larger hand than the last name "Lagneryd".

Jonas Lagneryd

Executive Summary

This qualitative action research explores integration of Strategic Sustainable Development (SSD) at Inova business incubator (Karlstad, Sweden). Researchers and incubator agreed that planning with sustainability in mind at a very early stage of company development may have important impacts on future business success and societal welfare. The objective was to answer how SSD could be integrated into the processes at Inova and how Inova staff's and entrepreneurs' understanding of sustainability demonstrably evolve after exposure to SSD.

Business leaders today are responding to pressure caused by a convergence of trends; increasing energy costs, legislation aimed at reducing pollution and waste, erosion of corporate trust, shortage of quality workers, and increased consumer awareness (Willard 2005, 11). Businesses acting proactively to mitigate their impact on the environment and society are beginning to see notable benefits. The realization has begun to sink in; businesses have a responsibility to be not only financially sustainable but also socially and environmentally sustainable.

Given the fact that small enterprises are an important source of economic growth, development and employment, there is a societal need to identify ways of introducing sustainability planning into such companies. Like small companies, start up companies display more flexibility in their decision making processes, and also have fewer resources for implementing those decisions. This stage of a company's development poses an important leverage point, as designing a business strategy that will anticipate risk and maximize opportunity is an essential planning tool for success. To this end a partnership was created with Inova to integrate sustainability into current start up incubation processes. According to the initial agreement reached in December 2006, the research team was invited to work from Inova for two months, conducting action research.

The researchers hoped to show that Strategic Sustainable Development (SSD) could offer a valuable layer of systemic understanding to start up companies by incorporating knowledge of the ecosystems' interactions with business processes, and complementary tools to guide decision making. This study does not generalize about all incubators. It provides in-depth insight into one case, which may provide useful indicators for other entrepreneurs and start up companies.

1.1 Strategic Sustainable Development

Sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their needs” (World Commission on Environment and Development 1987). The Framework for Strategic Sustainable Development (FSSD), designed in the early 1990s, is meant to facilitate such development, and is not based on prescriptive actions, but on a structural approach to guide complex decision making (Robèrt 2000, 247)

The compass of FSSD is embodied in the 4 basic principles of sustainability. The creation of which has been guided by scientific research since initial inception (Holmberg et al. 1996). In their most recent revision the basic socio-ecological sustainability principles read (Ny et al. 2006, 64):

In a sustainable society nature is not subject to systematically increasing...

I. ... concentrations of substances extracted from the Earth's crust,

II. ...concentrations of substances produced by society,

III. ...degradation by physical means,

and, in that society...

IV ...people are not subject to conditions that systematically undermine their ability to meet their needs.

Apart from general research methods such as interviews, observation, surveys and document analysis, SSD methods and tools were used with three entrepreneurs and business incubator staff. Brief descriptions of the core FSSD methods used are presented below.

1.1.1 The Five Level Framework for Strategic Sustainable Development

Complex planning can be achieved through backcasting from principles of success (i.e. compliance with the four sustainability principles). It is useful

to understand how the system works and then; define successful sustainable business before choosing strategies, actions, and tools to achieve the goal in the best way (Robèrt 2000, 247; Robèrt et al. 2002, 198).

1. In addition to geographic location, industry sector, and business model, it is necessary for businesses to understand the natural laws which govern ecological and social interaction of human society in the biosphere. How material and energy flow between them is also of critical importance.

2. A successful sustainable business could consider; businesses vision, core purpose, values and goals in addition to the four sustainability principles as a guideline to frame decision making.

3. Backcasting from success guides businesses toward their ultimate vision. This basic concept can better inform the actions taken and tools used in business development. The ABCD methodology is one strategy tool that can be used.

4. Examples from businesses engaged in sustainability were used to demonstrate opportunity and create inspiration for entrepreneurs.

5. Tools consist of methods, indicators, steering processes, and anything which is used to perform an action. The TSPD method and the ABCD methodology are examples of tools used with the incubator.

1.1.2 The Templates for Sustainable Product Development (TSPDs)

The TSPDs are subject to ongoing research, and has been used to facilitate dialogue within companies whose goals include sustainable product development. (Ny, H. 2006). The purpose of the TSPDs is to, bridge the competence gap between sustainability expert and client, facilitate discussion and decisions between various company departments, and influence the organization's long term ability to find improvements in product/service which are relevant for Strategic Sustainable Development

Figure 1. The TSPD method – box overview

1.1.3 A-B-C-D Methodology

ABCD is used in FSSD to develop a strategy (level 3) which is guided by a principled definition of sustainability and a clear vision of success (Robèrt 2000, 247). Overall it is best used to bring a group together in a creative process where there is a clear desired goal in mind.

Awareness – A

This stage of the strategy is about setting the boundaries of the topic being addressed. Is it a product/service, or whole company model that is being discussed? It is most useful to have discussed the system and success levels of the Five Level Framework (above) before beginning such a strategy session.

Baseline mapping - B

Using the four sustainability principles baseline mapping is used to assess the strengths/weaknesses, and opportunities/threats of the company's current situation. The four sustainability principles can be used to assess potential opportunities, for instance how would the product, as it is

currently designed comply with the four sustainability principles? How will it violate them?

Compelling vision - C

A creative process is used to develop solutions to sustainability violations which were identified during the B step. “Solutions such as new energy systems, saving resources, substitutions of materials, new and more service-oriented and resource-saving business models, etc. can be listed” (Robèrt et al. 2006, 45-48). A creative gap between current situation and desired future is used to generate actions for improvements.

Down to action – D

Ideas and actions are next scrutinized using prioritization questions. The company can avoid poor long term investments through this process, and other criteria can also be added to this list

- Is the measure taking the organization towards its vision?
- Is the measure bringing the society as a whole towards sustainability?
- Is the measure a flexible platform the organization can build on in the future?
- Does the measure provide satisfactory return on investment (social, political, economical)?

1.2 Sustainability integration in incubator process

The effectiveness of the aforementioned tools and methods was evaluated with staff and entrepreneurs at Inova business incubator to provide insight to the research question, *how can Strategic Sustainable Development be integrated into the processes at Inova?* Below is a diagram to visualize where specific tools could be introduced in Inova’s current incubation process. The grey boxes dictate where in the process the recommended tool is used.

Figure 2. Introduction of SSD tools in the incubation process

1.2.1 Process Description

This approach is designed to complement current processes, while integrating a sustainability approach into existing incubator development methods (workshops, presentation meetings, strategy making). In this model the coaches/staff of the incubator act as a support system and outside expertise is brought in when necessary.

Screening stage

Engaging sustainability through triggering questions to prospective incubator candidates can measure the entrepreneur's overall awareness and willingness to engage sustainability in the future.

Sustainability awareness building should clarify for incubator candidates; 1. What is sustainability? 2. Why is it important for business? 3. What opportunities exist? 4. How can sustainability enrich business development?

Analysis stage

Backcasting strategy using ABCD methodology provides an opportunity for the entrepreneur to think long term about a company vision which incorporates an understanding of sustainability. Identification of unforeseen opportunities and threats with regard to material, energy, information flows, will assist the incubator in deciding which businesses to accept.

Business Development stage

Templates for Sustainable Product Development (TSPDs) pose questions to encourage overarching analysis of the product/service from a sustainability perspective. Its use early in the Business Development stage can create new market ideas, inform conceptual product design, and/or alter the business model.

Monitoring business development towards sustainability assists in tracking the generation of new ideas from the TSPDs to implementation will create a record of successes/challenges, further informing future decision making (financial implications of choosing renewable materials, logistical considerations for supply chain management, etc.).

Growth stage

Building the network through alumni engagement upon leaving the incubator will help build success stories. Those which have succeeded in implementing and benefiting from sustainability thinking can inspire others.

1.2.2 Key Findings: Evolution of understanding

In addition to an integration process it is notable that staff and entrepreneurs experienced significant evolution in understanding as a result of exposure to Strategic Sustainable Development.

Entrepreneurs working with Strategic Sustainable Development demonstrated; gaining a new perspective on their business development, new ideas were identified, such as; new product, value chain engagement, business model, and partnership opportunities, commitment to further exploration of sustainability in the company.

Inova staff working with Strategic Sustainable Development demonstrated; an increased perspective on the boundary of responsibility for companies in regards to their environmental and social impact in society. They gained a new perspective on their internal processes, on questions posed to startups at various stages of incubation, and on the appropriate staff expertise needed. Overall priorities shifted from a desire to; gain the interest of businesses in the incubator, define sustainability, and introduce a seventh

criterion to guide sustainability integration. New priorities of; translating sustainability into language and examples that speak to business, identifying external experts to support start up companies, gaining an appropriate staff/coach competence level and agreeing upon a strategy for full implementation.

Research results were validated by two external organizations and Inova staff. Experts in entrepreneurial business development were asked to reflect on our proposed sustainability integration process, and offer insight into its applicability in their organizations. Overall feedback on the concept, process, and applicability of tools was considered valuable and relevant.

We can conclude that Inova staff and entrepreneurs, working with SSD, began to develop an;

- understanding of business' dependence on and relationship to broader societal and ecological systems
- ability to use backcasting from the basic socio-ecological principles of sustainability in business planning.

In turn they experienced an increased capacity to identify sustainability related business risks and opportunities.

As a result of the work, Inova is committed to moving forward with the implementation of the proposed integration of Strategic Sustainable Development into the incubator process.

The proposed integration process is designed to be specific to Inova's internal processes, yet general enough for another assistance organization to gain insight from. We feel that the tools tested fit best in this configuration as they follow a logical learning curve and allow for development of understanding and increasing complexity of analysis of one's business. The research results allow us to conclude that Inova and similar entrepreneur assisting organizations provide a useful arena to integrate Strategic Sustainable Development.

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1 Introduction

1.1 Sustainability

Business leaders today are responding to pressure from a convergence of trends: increasing energy costs, legislation aimed at reducing pollution and waste, erosion of corporate trust, shortage of quality workers, and increased consumer awareness (Willard 2005, 11). Our current economic system is built on a belief that the economy is the end and the environment is a means to achieve it—that natural and social capital exists for the benefit of economic progress. However, the market pressures of today and the view of nature as an economic input to be used as one wishes, are not congruent.

Businesses that realize the health of the economy depends on the health of the earth's social and ecosystems are acting proactively to mitigate their negative impacts on the society and environment and seeing financial benefits. The realization has begun to sink in; businesses have a responsibility to be not only financially sustainable but also socially and environmentally sustainable.

1.2 Funnel paradigm

Sustainability implies maintaining what is in existence, in this case our ability to live on earth. The current situation for society can be described as a funnel with ever-diminishing capacity for health, a vibrant economy, and welfare (see Figure 1.1). Life-supporting systems—necessary for continued human existence on the planet—are in decline. At the same time, the global population and the global demand for these resources are steadily increasing. For businesses, understanding the potential risks of this scenario may bring great opportunity.

The Funnel

Figure 1.1. The Funnel Metaphor

Source: Robèrt 2006.

It is now widely accepted that since the industrial revolution increasing pressure for economic growth and diminishing environmental resources has set society on an unsustainable path. Evidence comes in volumes of reports from government and non-profit organizations worldwide illustrating;

- Loss of fertile land mass, decreasing clean water supplies, decline in untouched forests, overall loss of biodiversity (WWF International 2006).
- Climate change is linked primarily to human development in the form of fossil fuel use, manipulation of land-use, and industrial agricultural production (Intergovernmental Panel on Climate Change 2007, 2).
- The more society manipulates nature, the less productive our fertile land and water bodies become and the more resource inputs are needed to yield the same production as before (Robèrt et al. 2000, 243).

- 30 percent decline in diversity of land and water animals, and plant species in the past 33 years (WWF International 2006).
- Increasing human life expectancy and population have increased the strain on the earth's systems (Millennium Ecosystem Assessment 2005).
- The number of starving people has increased in the last decade and 31.6 percent of the world's population now live in slums. (Glenn et al. 2006)
- Quality of life is not been increasing even though global GDP has.

Our current practices are leading to decreased opportunity for unrestricted business growth, which is visible through higher costs for waste disposal, commercial real estate, and raw material inputs (wood, water, grain, etc). One could be said to be “hitting the wall” of the funnel. At the same time, the funnel metaphor highlights the opportunity for business and society to act in time to successfully manoeuvre toward a sustainable society. A sense of urgency is pulsating throughout the business sector today, reflecting a new understanding that industrial development must realistically align within the laws of nature. A systemic approach is needed.

1.3 Societal need

Large multinational corporations have been making increasingly public commitments to “greening” their business practices in the last year. While Scandinavian companies like IKEA, Scandic Hotels, and Volvo have been incorporating sustainability into their practices for some time, North American companies like Home Depot, Wal-Mart, and General Electric (G.E.) have made significant public commitments as well. The message from these companies is that running a business with environmental and social sustainability values is not just good for the earth and society, but it is also just good business.

There is currently a gap between the attention paid to sustainability issues in big companies (with access to financial and human resources) and small companies (that lack these resources) (Persson 2003, 7). Even though a big company can have substantial influence in its supply chain when adhering

to sustainability practices and requiring its suppliers to do so, the shift to comprehensive sustainability planning can be a long-term process. On the other hand, small enterprises can integrate sustainability quickly, and positively influence local markets¹.

Given the fact that small enterprises are an important source of economic growth, development, and employment, there is a societal need to identify ways of introducing sustainability planning into such companies. Like small companies, start up companies often have more flexibility in their decision making processes, but have fewer resources for implementing those decisions. Although small to medium sized enterprises (SMEs) as a whole are difficult to categorize, some studies suggest that the percentage of waste produced by this sub-set can reach up to 50 percent of total business contribution of waste in Europe (European Network for SME Research 2002).

1.4 Sustainability advantage for small/medium sized companies

According to initial research, sustainability can bring indispensable advantages for small companies. Some benefits identified by the European Network for SME Research (2002) are:

- organizational: better management, better compliance with legal requirements, more active staff commitment
- economic: cost savings, for example lower costs for materials and energy
- commercial: competitive advantages, new business opportunities, market share

¹ Additionally, effective consumer education can result from strong personal relationships at the community level. Examples can be found in several case studies documented by The Natural Step New Zealand 2001 at (<http://www.naturalstep.org.nz/a-t-f-case-studies.asp>).

- environmental: reduced pollution, increased energy/material efficiencies
- communicational: a positive public image, better relationships with customers and authorities, better access to capital from environmentally-sensitive investors

The benefits outlined above address the ecological and economical dimension. Other broad sustainability benefits are:

- educational: rising awareness in the local community
- community: creating demand for local goods and services and supporting self-sufficiency
- societal: improved image, better relationships and communication with stakeholders (Hillary 1999, 137).

1.5 The entrepreneur as innovator

In society, entrepreneurs with new ideas are seen as a means of introducing innovation and support to the local economy. Paul Trott argues that companies must adapt to new challenges and conditions and evolve if they are to survive (Trott 2005, 5). Thus entrepreneurs can exist inside or independent of existing companies. Their defining characteristic is a drive to make products or services better (incremental innovation) or to make unique new products (radical innovation) (Trott 2005, 16).

Entrepreneurs are innovators and the sustainability challenges society faces will likely take bold innovation. Entrepreneurs may have a unique opportunity to move society more quickly toward sustainability by building sustainable businesses.

Start up companies can be broadly defined as those in beginning stages of development, they may or may not have generated any income or sold any products or services. Many companies launch and fail each year, sometimes within the same year. Not all entrepreneurs seek outside assistance; part of the “entrepreneurial spirit” is a characteristic of self reliance and risk

taking. However, starting a business requires competence in many areas, and it is often necessary for entrepreneurs to seek expert advice in some capacity. For some, taking on partners who invest money or time brings necessary competence. Others will reach out to non-governmental or public institutions that specialize in information sharing for a specific industry or demographic of business owner.

1.6 Business incubators as assistance organizations

The start up phase of companies seems to be an important leverage point for effectively integrating sustainability, but an initial overview of literature produced little insight into this process. Exploratory contact with assistance organizations showed interest in sustainable business development as a way to enrich current strategies, and help entrepreneurs design a business strategy that will anticipate risk and maximize opportunity.

The Swedish government and public authorities have a tradition of providing incentives to support innovation. One such initiative is the Swedish national incubator programme developed by Innovationsbron Sverige together with VINNOVA (The Swedish Governmental Agency for Innovation Systems). The vision of the programme is that incubators shall develop and position themselves to be world class. Ten of the strongest Swedish incubators were chosen to be part of the programme.

The concept of incubators came from the United States where the first incubators were established in the 1950s. The purpose was to support entrepreneurial academics at universities. In Sweden, with inspiration from the American model, the first incubators were established in the 1970s. Today, incubators vary in size and profile but share some characteristics. An incubator assists young companies to overcome obstacles to their success, develop business competence, and gain access to external funding. The incubator works to create strong companies with new ideas and technological advances for society, leading to new jobs and increased social welfare (SiSP 2007).

A partnership was developed with the Swedish Incubator Inova in order to gain access to entrepreneurs in the early business development phase. Action research took place over the course of two months.

1.6.1 Inova Incubation process

Inova is an incubator, in the county of Värmland Sweden, creating new businesses at the interface between academia, private industry, and the public sector. Inova's purpose is to capture business concepts with favourable growth potential and provide them with the opportunity to become successful companies. Inova's services mirror those of many European incubators by offering a broad range of support to clients through in-house staff, outside advisors, and encouraging networking amongst businesses themselves.

Inova accepts over 140 proposals from aspiring entrepreneurs from throughout the region each year. Proposals are then analyzed for business readiness by staff and regional partners. A few promising individuals are chosen to be housed at Inova in Karlstad, where they are offered office space, coaching, and networking opportunities. The goal is for each business to gain capital investment within eighteen months.

Current incubation process

With financial support from various public institutions, Inova utilizes a vast array of partnerships to recruit, screen, analyze, and support the development of new start up companies. Figure 1.2 describes Inova's general path for a start up company. This process is dynamic and the length of time in each stage varies for each company.

Figure 1.2. Current incubation process at Inova

Description of incubation stages

At the SCREENING stage, people with ideas either contact Inova directly or are referred by external partners. Through telephone and face-to-face interaction, Inova screens business ideas based on overall readiness and whether it is an appropriate fit for incubation.

During ANALYSIS, chosen entrepreneurs receive a more thorough review. A team of Inova staff and external partners meet with the entrepreneur/s and discuss the business idea in contrast to Inova's six criteria (see Table 1.1).

Table 1.1. The six criteria used at Inova

Focus area	Guiding question
Customer/Market	Is there an obvious customer and anticipated market for the product/service?
Uniqueness	Is the company distinct from others in a similar market?
Competitive analysis	What competitors exist, what are their strengths and weaknesses?
Growth/Job openings	Will the project create growth in the region, and more job opportunities?
Management/Team	Do the entrepreneurs have managerial competence; do they have the potential to succeed?
Business model and budget	What is the business model like? Can the projected budget support the company during incubation?

Source: Inova, internal document (Lööv 2006)

Once accepted into BUSINESS DEVELOPMENT, the business is assessed continuously using the six criteria as guidance. The entrepreneurs receive assistance by means of individualized coaching, expert advice, group presentations, and networking opportunities. Checkpoints are established to evaluate progress toward the ultimate goal of generating revenue, finding a partner, or gaining capital investment.

GROWTH begins when the incubation period is over, but the relationship with Inova continues. After incubation, businesses are able to access the Inova network and are encouraged to share knowledge within it.

1.7 Purpose of the study

Within the incubator setting, the research team had access to staff and business owners to test tools associated with the Framework for Strategic Sustainable Development (FSSD). This planning process, developed since the 1990's through practical and theoretical application, offers a guide to complex decision-making toward sustainability (Robèrt 2000, 247).

The researchers hope to show that Strategic Sustainable Development (SSD) can offer a valuable layer of systemic understanding to business development by incorporating (1) knowledge of the ecosystems' interactions with business processes, and (2) complementary tools to guide decision-making. A systems-based approach seems to be a good starting point for developing a profitable and resilient business. Businesses with this perspective are likely to be sustainable financially and with regards to the broader socio-ecological perspective.

This study does not generalize about incubators. It provides in-depth insight into one case, which can be used as evidence of behaviour that might apply to entrepreneurs and start up companies in general. In the last, year Inova has experienced increased interest from their donors about sustainability planning with companies. Inova's board has directed that a criteria for sustainability competence be created, and Inova is aware of ever increasing interest of venture capitalists in environmentally and socially aware technologies and products. A sustainability focus could therefore become one of the criteria used by the incubator for accepting new business ideas, and a measure of allocating public funds among entrepreneurship supporting organizations (Lööv 2007, pers. comm.).

As an outcome of the research team's work Inova hopes to more efficiently move towards sustainability, and eventually become a sustainable incubator.

1.7.1 Research questions

The aim of the research was to answer the following questions.

Primary research question:

How could Strategic Sustainable Development be integrated into the processes at Inova?

Secondary research questions:

How does Inova staff's understanding of sustainability demonstrably evolve after exposure to Strategic Sustainable Development?

How does Inova entrepreneurs' understanding of sustainability demonstrably evolve after exposure to Strategic Sustainable Development?

Processes in this case include separate stages of incubation through which each company goes (screening, analysis, business development and growth). If the incubation process shall be enriched by sustainability assessment of a business idea then will a change of current process need to occur?

1.8 Scope and limitations

Working on-site at Inova, the research team reviewed the internal processes of how the incubator assesses, accepts, and develops their companies. A combination of surveys, training, and testing of tools were carried out with companies in various stages of incubation. Follow up interviews measured the entrepreneurs' responses and potential changes in their approach or attitude toward their business development.

Interaction within the incubator—including staff and companies housed there—define the boundary of our research. Given that the services offered by incubators vary, the outcomes of the study are therefore valid for this particular setting. However, the results and recommendations can be applied more broadly. There should be applicable benefits for similar organizations working with aspiring entrepreneurs and start up companies both in Sweden and in other countries.

1.9 Framework for Strategic Sustainable Development

A framework has been developed in an attempt to bridge the gap between how we currently conduct ourselves in human society and a sustainable vision of the future. The FSSD is the pioneering work of The Natural Step², a non-government organization working strategically toward a sustainable society.

Sustainable development is “development that meets the needs of the present without compromising the ability of future generations to meet their needs” (World Commission on Environment and Development 1987). The FSSD is meant to facilitate such development, and is not based on prescriptive actions, but on a structural approach to guide complex decision-making (Robèrt 2000, 247). This broad approach has been designed to complement existing tools and strategies. It acts like a compass for planning the societal transition toward sustainability, which organizations can use to find their own creative way to reach their goals. (Broman et al. 2000, 14).

The introduction of Strategic Sustainable Development requires a basic knowledge of certain definitions and concepts, explored below.

1.9.1 Socio-ecological sustainability principles

The heart of FSSD is the set of four basic principles of sustainability. The creation of which has been guided by scientific research since initial inception (Holmberg et al. 1996). Since the concept of sustainability becomes relevant only as we understand the un-sustainability of current activities in society, the principles for sustainability are designed as

² The Natural Step was founded in 1989 by Dr. Karl Henrik Robèrt. The Strategic Sustainable Development Framework (FSSD) has been refined through scientific/academic research, and practical application.

restrictions. Thus the principles describe what society must *not* do in order to avoid destroying the ecosphere that sustains us. Correcting problems at the system level (root) helps to address the underlying cause and avoid new ones.

In their most recent revision the basic socio-ecological sustainability principles read (Ny et al. 2006, 64):

In a sustainable society nature is not subject to systematically increasing...

I. concentrations of substances extracted from the Earth's crust,

II. concentrations of substances produced by society,

III. degradation by physical means,

and, in that society...

IV. people are not subject to conditions that systematically undermine their ability to meet their needs³.

“Systematic increases in concentration” is an important concept in the sustainability principles, and it is important to clarify a common misconception that the principles imply that one cannot contribute in any way to their violation. For example, logging is not necessarily a sustainability problem; it is when trees are cut down faster than regeneration can occur that problems arise (Robèrt 2006). It is not sustainable to keep logging more and more and at a faster rate than nature can replenish itself.

For a business leader navigating a myriad of complex decisions, it can be reassuring to understand the basic principles of sustainability so that the full impact of those decisions can be taken into account. If a business is dependent on lumber as a raw material input, and the principles are taken into account, that business might identify a need work to replace what is taken. At a more advanced level, they might consider looking for an

³ Max-Neef (1990) defines non hierarchical human needs as: subsistence, protection, affection, understanding, identity, creation, participation, leisure, freedom.

alternative material altogether. Systematically increasing rates of destruction are problematic because there are often lengthy time delays and hidden feedback loops between an action and its corresponding environmental and social impact. Additionally it is impossible to predict all the effects of our actions. Approaching sustainability from a principled definition and working to address issues before they arise is a more practical attempt to preventing the problem at its source (Azar et al 1996, 89-90).

1.9.2 Backcasting from Principles of Sustainability

One of the strengths of using FSSD for business planning is its inherent focus on backcasting (Robinson 1990). Implied in the term “strategy,” backcasting means having a well-defined outcome in mind towards which to plan. “This means that today’s trends (i.e. customer’s preferences) should only influence the pace and the initial scale of the transition, not its direction” (Robèrt et al 2002, 201). This is a common approach. For instance in business, when designing a new product, one considers what the market desires or what people need. Then various configurations can be designed that might meet that overall desire/need, and steps are taken to create a product or service that meets the criteria of the company and the ideal customer.

Strategic backcasting allows a business to recognize trends of unsustainability as symptoms of larger problems. Planning accordingly can create a financially successful and ecologically sustainable business preemptively avoiding the risk of “hitting the walls of the funnel” (Robèrt et al. 2002, 202). New opportunities can arise from increased creativity, bringing forth new innovations and new markets.

Providing structure to sustainability planning, the generic Five Level Framework for planning in complex systems (see Figure 1.3) requires that a definition of success comes before discussions of actions and tools.

Figure 1.3. Five Level Framework for planning and decision-making in complex systems

Source : Robèrt et al. 2002, 198; Robèrt 2000, 247

2 Methodology

2.1 Research approach

This study uses qualitative research design promoted by Maxwell (2005). The author argues that developing a logical research strategy and then following planned steps is practically impossible. He stresses that research design is: "...an ongoing process that involves....tackling back and forth between the different components of the design, assessing the implications of goals, theories, research questions, methods and validity threats for one another" (Maxwell 2005, 3). The research process evolves from the start to the very end. Every component of the design is tied to the others and together they form, "an integrated and interacting whole" (Maxwell 2005, 4) – see Figure 2.1. This approach is appropriate when performing action research, which studies outcomes in two areas: benefits for the body of academic knowledge and benefits within a learning organization (Inova). According to Zuber-Skerritt and Chad (2002, 173) action research incorporates three key aspects:

- A group of people at work together..
- involved in the cycle of planning, acting, observing, and reflecting on their work more deliberately and systematically than usual..
- producing a public report of that experience (such as thesis).

Various benefits for the participants of action research include access to the researchers as a resource to the participant, which is "...an opportunity for them to act effectively in their own interest." (Babbie 2001, 288). Toward this end Inova received training, one-on-one consultation, and a toolbox of materials and presentations to be used in their future work with start up companies.

2.2 Research relationships

The selection of Inova as a research partner could be classified as "purposeful selection" where the site and participants are carefully selected

in order to obtain information which may otherwise be difficult to access (Maxwell 2005, 88).

The partnership developed out of Inova's initial interest in sustainability. Inova saw an opportunity to incorporate sustainability and increase their own profile within the incubator network in Sweden, and improve their support to start up companies. According to the initial agreement reached in December 2006, the research team was invited to conduct action research on-site at Inova for two months. Inova staff and entrepreneurs within the incubator were involved in the research in various ways. For the institution itself, a strategy to guide sustainability integration was developed. The director and coaches actively participated in this process and provided feedback for the research progress. Together with Inova staff, three businesses were selected for thorough collaboration. Selection occurred based on a desire to work with businesses at different stages of incubation, and on the entrepreneur's availability.

2.3 Data collection

When developing data collection techniques, the researchers did not follow a linear way of asking questions directly to participants. Rather—in the setting of action research paradigm—researchers followed an iterative research approach. The most feasible means of getting data were used depending on the actual research (Maxwell 2005, 92). Connections between the research questions and methods are empirical. This learning experience allowed for exploration of sustainability understanding of entrepreneurs and Inova staff. In order to achieve a satisfactory level of understanding, the methodology was designed along the way—taking advantage of opportunities to gather relevant information, and searching deliberately for other information. The approach taken with each entrepreneur was slightly different in order to accommodate their varying levels of interest, time availability, and understanding of the issue. It was also important not to overwhelm them with information while trying to build the foundation for long-term engagement with sustainability.

As a result of these factors, the triangulation approach suggested by Maxwell was used to reduce possible bias (2005, 112). Several methods

were engaged while gathering data related to each research question (see Figure 2.1).

Figure 2.1. An overview of methods used in relation to the stage of the research they were applied in.

2.3.1 Observation

Observation was performed during the entire research period. Opportunities for observation of the entrepreneurs arose in individual meetings, workshop interactions, and training exercises. Additionally, working closely with Inova staff allowed for observation in a wide variety of activities; capacity building with start-ups, internal meetings, and workshop presentations (with Inova and with entrepreneurs). To capture useful information one member of the research team was assigned the role of “observer” for each meeting/workshop. During the interaction, the observer took notes and compiled them afterwards. For each meeting, goals were set beforehand and anticipated insights regarding research question were identified. Following the meeting, the observer debriefed the research team. Feedback

was then given on the research team's approach, subject's reactions, and ideas that helped to answer the research questions.

2.3.2 Document analysis

Internal documents of Inova and companies were reviewed. Documents provided by Inova helped build understanding of the incubation process, identifying possible leverage points. Documents created by the entrepreneurs explained their business idea in detail, providing insight on their project planning, business thinking in terms of time perspective, and awareness of opportunities and threats. The amount of information available varied, as the businesses were at different stages of incubation.

2.3.3 The Sustainability Learning Curve (SLC)

The Sustainability Learning Curve (SLC) was used as a means of data analysis to frame the evolution of sustainability understanding among research participants. The concept (Nattrass and Altomare 1999, 16; 2002, 41; see Appendix A) was originally developed to show the progression of corporate action concerning sustainability from the early 1970s to present. The term sustainability has been used since the 1980s, and from that time the business approach to sustainability has continuously evolved. The SLC graphically depicts the increased awareness of sustainability by large businesses over the decades.

The SLC was also used in the workshops as an awareness building tool and a starting point for ongoing discussion about where businesses fit on the learning curve and what to do in order to move upwards toward sustainable development.

2.3.4 Survey

The SLC was used to create a survey measuring the difference between the participants' understanding of sustainability from pre-survey to post-survey, and to inform a further process of interaction.

In this research the SLC was used to show the entrepreneur's understanding of sustainability in three areas:

1. What is my ultimate goal? (i.e. sustainable development, compliance, beyond compliance)
2. What is my company's environmental strategy?
3. What is important to me? (i.e. influences business decisions)

The survey aimed to capture initial information from both staff and entrepreneurs (e.g. attitudes and pre-conceived notions of sustainability). Later, the data would serve as a reference point to evaluate the impact of workshops and training on participants' understanding of the FSSD. The survey was constructed following general guidelines suggested by Oppenheim (2001, 7-8).

Pre-survey

A pre-survey (see Appendix B) was used prior to any exposure of sustainability.

Goal: To assess the level of entrepreneurs' understanding of sustainability before being exposed to Strategic Sustainable Development.

The pre-survey was divided into three areas: an open question asking for a general explanation of what sustainability means to the participant, an opportunity for the participant to compare his/her company's environmental policy statements with a general list of policy statements, and a set of questions which participants were to value as of importance to their company.

After the pre-survey participants were educated using a lecture format. Three of the entrepreneurs worked closely with the research team testing the Templates for Sustainable Product Development (TSPD) method.

Post-survey

The post-survey was meant to capture a change in subjects' attitude of sustainability after exposure to methods and tools of Strategic Sustainable Development. The respondents were given the same survey and the two were compared to assess any change.

Goal: To re-assess the level of entrepreneurs' understanding of sustainability after being exposed to Strategic Sustainable Development.

The three select companies were the only ones to participate in the post-survey.

2.3.5 Interviews

Interviews were used as supplementary data collection to observation. The interviews provided additional information that may have been missed during observation and was used to check the accuracy of observations (Maxwell 2005, 94). Both un-standardized and semi-standardized interviews were used with entrepreneurs and staff in one-to-one interaction:

Semi-standardized interview

A sequence of well-designed questions was created to get feedback on the usefulness of the TSPD method for business planning and decision-making, and assess whether the entrepreneur's understanding of sustainability changed over the period of the research.

Un-standardized (informal) interview

At Inova, the setting for casual conversations encouraged an unobtrusive approach with entrepreneurs. All the companies are situated in the same building, and a common space is provided. Having an office at Inova facilitated the development of personal relationships with Inova staff and entrepreneurs. The research team members were not perceived as "strangers coming to study us" but as a natural part of Inova.

2.4 Strategic Sustainable Development Tools

During the research period the following tools and methods were used. The outline of the Five Level Framework below depicts a chronological overview of how SSD was introduced:

Table 2.1. Generic Five Level Framework and its applications

Level	Generic Five Level Framework applied to achieve a “sustainable society in the biosphere”	Generic Five Level Framework applied to a business incubation process to integrate sustainability (RQ1)
1. System	Dynamic relationships between the ecological and social systems	Key structures within the incubator that constitute a base for incubation process. Basic flows, mechanisms, management routines.
2. Success	Global socio-ecological sustainability (4 sustainability principles)	Process delivering successful and sustainable business ideas (based on clear vision of success, 4 system principles)
3. Strategy	Strategic guidelines to move toward a sustainable society. Backcasting from principles.	Strategy to arrive to an integrated process. Strategy guidelines for an integrated process development for each stage.
4. Actions	Actions moving society toward sustainability	Actions to establish an integrated process
5. Tools	Techniques, measurements, monitoring, management approaches to assist movement toward meeting the 4 principles	Engaging questions, Sustainability awareness building presentation, Templates, Monitoring tools, Networking tools

Source: Robèrt 2000, 247; Robèrt et al. 2002, 198

2.4.1 The Five Level Framework for Planning and Decision-making in Complex Systems

Complex planning can be achieved through backcasting from principles of success (i.e. sustainability). It is useful to understand the system within which one works and then define what successful sustainable business means before choosing strategies, actions, and tools to achieve the goal.

Here, the Five Level Framework is presented in detail to guide sustainable business planning with start up companies.

Level 1. System

Defining success as “sustainable business” requires adequate knowledge of the system within which the business operates. In addition to geographic location, industry sector, and business model, it is necessary to understand the business’ place in society in the biosphere. How material and energy flows between them is also of critical importance. The following concepts were elaborated upon to build entrepreneurial understanding.

- Illustration of current unsustainable development trends. Human society is dependent upon healthy social and ecological functioning. Current patterns show declining health of the system—demonstrated by increasing risk for business.
- Underpinning natural laws of science that govern society (e.g. thermodynamics, conservation laws, photosynthesis as a primary engine driving energy generation, and humans as social species).

Three mechanisms by which humans can destroy nature (Holmberg and Robèrt 2000);

1. Systematic increases of matter from outside the biosphere, i.e. metals, minerals
2. Systematic increases of matter produced by society which are foreign to nature, i.e. chemical compounds, non-organic industrial waste.
3. Systematic physical degradation of nature, i.e. land-filling, industrial agriculture, deforestation.

Level 2. Success

With an understanding of the larger system, it is possible to create a more informed definition of what it means to be successful as a business within the system. A successful sustainable business could consider:

- Business vision, core purpose, values, and goals.
- The four sustainability principles as a guideline to frame decision making.
- Placement on the SLC and asking where the business is headed, if it just wants to comply with current regulations, or if it is striving for ultimate sustainability.

Level 3. Strategy

Backcasting from success guides businesses toward their ultimate vision. This basic concept can better inform the actions taken and tools used in business development.

- Backcasting from a vision of success using the ABCD methodology (see section 2.4.2).
- A key part of the ABCD methodology uses prioritization questions (D-step), which are applied to action ideas created during strategy planning.
- TSPD is a strategy tool that allows companies to develop products using backcasting. It facilitates a more focused analysis between the baseline analysis (B step) and compelling vision (C step) components of the ABCD strategy.

Level 4. Actions

Examples from businesses engaged in sustainability were used to demonstrate opportunity and create inspiration for entrepreneurs. Examples included:

- The vision statements of industry leaders and indirect competitors

- Innovative product examples
- Profiles of entrepreneurial and corporate leaders in business sustainability
- Statistics on global investor interest in climate change mitigation and clean technology

Level 5. Tools

The tools listed below were delivered in a concise format, designed to be replicable for future use by the incubator.

- ABCD methodology
 - Sustainability awareness building (A step)
 - Templates for Sustainable Product Development (B-C steps)

2.4.2 ABCD Methodology

ABCD was used with Inova staff to develop a strategy (level 3) which is guided by a principled definition of sustainability and a clear vision of success (Robèrt 2000, 247)¹. Here it is described as it could be applied to businesses in general. Overall it is best used to bring a group together in a creative process where there is a clear desired goal in mind. The backcasting approach described in Section 1.9.2 is at the core of the ABCD method. It consists of four steps:

¹ Examples of use can be found in: Oldmark, Jonas et al. 2004. Verksamhetsledning för hållbara affärer:112: Det Naturliga Steget, The Natural Step. 2004. Management system for sustainable business. Stockholm: TNS, e-learning module Step by Natural Step produced by TNS Canada, http://www.naturalstep.ca/SBNS_FINAL_Jan302006/SBNS_Introduction.htm, accessed May 2nd 2007.

Awareness - A

This stage of the strategy is about setting the boundaries of the topic being addressed. Is it a product/service, or whole company model that is being discussed? It is most useful to have discussed the system and success levels of the Five Level Framework (above) before beginning a strategy session.

Baseline mapping - B

Baseline mapping— employing the four sustainability principles—is used to assess the strengths/weaknesses and opportunities/threats of the company's current situation.

As the business is in a conceptual phase at this stage, one could pose a hypothetical business model or product on which to conduct the assessment. The four sustainability principles can be used to assess potential opportunities, for instance how would the product, as it is currently designed comply with the four sustainability principles? How will it violate them?

It may be helpful focus on energy, material and information flows by asking; What do we deliver? What do we depend on? What is left over?

Compelling vision - C

A creative process was used to develop solutions to sustainability violations that were identified during the B step. "Solutions such as new energy systems, saving resources, substitutions of materials, new and more service-oriented and resource-saving business models, etc. can be listed" (Robèrt et al. 2006, 49). The gap between current situation and desired future was used to generate creative actions for improvements.

Down to action – D

Ideas and actions are next scrutinized using prioritization questions. The answers to these questions can provide a starting point for choosing actions to move toward sustainability. Answers to the questions are not necessarily affirmative or negative, and it is most useful to the overall judge the actions against each other. The company can avoid poor long term investments which do not provide flexibility for further action, or identify actions which

will increase cash flow for further investment. Other criteria can also be added to this list

1. Is the measure taking the organization towards its vision?
2. Is the measure bringing the society as a whole towards sustainability?
3. Is the measure a flexible platform the organization can build on in the future?
4. Does the measure provide satisfactory return on investment (social, political, economical)?

The following business planning model (Robèrt et al. 2006, 232) can be used to visualize the ABCD method, making it more relevant to business.

Figure 2.2. The Business planning model

Source: Robèrt et al. 2006, 232

2.4.3 Sustainability awareness building: A-step

To introduce the subject of sustainability to the three start up companies for the first time, the details from the system and success levels of the aforementioned The Five Level Framework for Planning and Decision-making in Complex Systems were delivered via a one hour presentation.

The presentation's aim was to clarify the answers to the following questions.

1. What is sustainability?
2. Why is it important for business?
3. What opportunities exist?
4. How can sustainability enrich business development?

2.4.4 Templates for sustainable product development (TSPDs): B-C-steps

The TSPDs (see Appendix C) is a strategic tool used to facilitate dialogue within companies whose goals include sustainable product development. (Ny, 2006).

The purpose of the TSPDs is to:

- Bridge the competence gap between sustainability expert and client
- Facilitate discussion and decisions between various company departments
- Influence the organization's long term ability to find improvements in product/service which are relevant for SSD².

The TSPDs were used with both the business incubator (in edited format for a service organization) and three start up companies (see Figure 2.3).

² This goal was not addressed with start up companies as the length of the research period did not allow to assess long-term influence

1) TSPDs for service based organization (Inova)

Presented in workshop format, the TSPD method was supplemented by a visioning session and an action planning session. Participants were guided through template questions and asked to generate answers in a group setting.

Workshop 1:

A cross departmental team of six staff came together to discuss Inova's vision of success, and were then presented with a template of questions, and answers formulated from the research team's perspective. One by one, each question was discussed, and Inova's clarifications and additional thoughts were added to those of the research teams'.

Workshop 2:

A continuation of the first workshop, the session ended with the identification of three long term and eight immediate actions to take (Appendix G).

2) TSPDs for start up companies

Three companies used the TSPD method to analyze current and future market desires, conceptual design of their product, and the company's interaction with market, suppliers, and societal stakeholders.

Additional goals for start up company use:

- Find complements with current strategy tools.
- Provide new insight on future business opportunities/benefits.
- Test the TSPD method's applicability to start up companies for future use by Inova.

After the entrepreneurs were first presented with an introduction to sustainability, the TSPD method was introduced (see Appendix D) to both the Inova coaches and the entrepreneurs. The research team provided the first set of template answers, which were given to the entrepreneurs and

coaches for collaborative reflection. The research team reviewed their comments and answered clarification questions and a summary report was presented. Follow up interviews were conducted with each entrepreneur with coaches present. Coaches were interviewed separately about the TSPD process.

Figure 2.3. The TSPD method – box overview

2.5 Validity concerns

The following validity threats are of particular concern during action research (Maxwell 2005, 108-113):

- **Researcher bias:** Following pre-fabricated solutions rather than listening to new ideas coming from research participants.
- **Reactivity:** The influence of the researcher on the setting or individuals studied.

Interactions between research team and participants were deliberately planned. A thorough attempt was made to maintain an experimental setting

(pre-analysis, interaction, post-analysis). For example a danger of self-approval of our influence (unconsciously pushing participants to provide suitable evidence) needs to be carefully scrutinized. The researchers identified the following strategies to mitigate the validity threats:

- ***Respondent validation.*** Various feedback mechanisms were used with participants and external experts to validate the author's research findings. Findings were reported and discussed with Inova staff and entrepreneurs. A final report of the strategy workshop was given to the incubator to validate the outcome of the workshop. Additionally separate TSPD reports were validated by entrepreneurs.
- ***Comparison.*** The outcome of this study will apply primarily to one specific case (Inova incubator and companies within). However the final product can be used and further tested in similar settings – organizations helping entrepreneurs. Similar external organizations were asked to validate the research outcomes including Innovationsbron Väst AB (a network of incubators in western Sweden) and Coompanion Kooperativ Utveckling Skåne (an organization helping entrepreneurs).
- ***Triangulation:*** Different combinations of methods were used when gathering data to avoid skewed outcomes. Some of the tools used were discussed with incubator staff or external experts while others were developed according to literature overview (see reference list).
- ***Long term involvement.*** A partnership of close contact was established to start a transformational process that will prepare Inova to be known as a “sustainable incubator.”
- ***Rich data.*** A mechanism for managing large amounts of data was prepared before data collection began. Formal mechanisms and personal responsibility were established to assist gathering of information in a structured way while preserving its richness (see section 2.3.1).

3 Results

The results section:

- Shows how the understanding of the role of sustainability in business among the incubator staff changed when introduced to SSD, and the use of the TSPD in that process.
- Shows how the understanding of entrepreneurs changed when introduced to SSD and the use of the TSPD.
- Presents a process for integrating sustainability into Inova's current system.

Figure 3.1 is a conceptual map linking the results with the research questions.

Figure 3.1. Relation of the research questions to attained results

3.1 Inova staff's shift in thinking

Research question:

How does Inova staff's understanding of sustainability demonstrably evolve after exposure to Strategic Sustainable Development?

Inova staff working with SSD demonstrated;

- An acknowledgment that the start up companies should take more responsibility for sustainability aspects associated with their operations.
- A new perspective on their internal processes, on questions posed to start ups at various stages of incubation, and on the appropriate staff expertise needed.
- Generally, priorities shifted from a desire to:
 - i. gain the interest of businesses in the incubator;
 - ii. define sustainability; and
 - iii. introduce a seventh criteria to guide sustainability integration.

To new priorities of:

- i. translating sustainability into language and examples that speak to business
- ii. identifying external experts to support start up companies;
- iii. gaining an appropriate staff/coach competence level; and
- iv. agreeing upon a strategy for full implementation.

3.1.1 Templates for Sustainable Product Development for Inova

The results from the workshop to develop a strategy for Inova are:

- A sustainability strategy is a key document for a start up company, therefore it is crucial to have all staff who work directly with companies present in sustainability strategy sessions. The experience helps to build staff understanding of the SSD process

and creates a shared experience, which can be a useful reference point in the future.

- A workshop format allows discussions among participants. Because there were different levels of understanding of what sustainability is and how it should be addressed, a substantial amount of time in the workshops should be spent discussing these issues and creating a shared understanding. Dedicating this time is key to successfully creating a deep understanding of sustainability.
- An inclusive atmosphere where the contribution of all participants is appreciated is ideal. Participants who feel that their ideas are recognized are more committed to supporting the process in the future.
- Ongoing interaction with one staff point-person throughout the research process facilitated the learning process. We received consistent feedback, were better able to understand the internal environment of the incubator, and Inova could monitor research progress on regular basis.
- It is desirable to conduct complex planning sessions in one's native language. The delivery of the Template workshop in English may have slowed understanding among those for whom English is not their native language.
- Establishing a shared vision before answering the template questions enabled participants to focus on the strategy component.

The TSPD method applied in a workshop setting demonstrated advantages and disadvantages. The following table summarizes notable points.

Table 3.1. Pros and cons of using TSPDs in workshop format for Inova strategy development

	Pros	Cons
Time constraints	In two months strategy development was started and SSD tools were tested with entrepreneurs.	Staff and entrepreneurs were short on time. The research team participated in the strategy development much more than expected.
Face to face interaction	Increased understanding by fostering necessary discussions between researchers and participants.	According to some feedback it was easy to “fly away” and more focus in the workshops was needed.
Language	Language that both sides understand was used (English). Swedish was used when producing the final Template.	Using Swedish as a native language of participants could have led to better outcomes for both staff and entrepreneurs, and led to increased overall understanding.
Missing visioning exercise in the workshop	Creating a vision before discussing strategy helped build a shared understanding in the group.	The vision was the brainstorm of one person and not all the staff were engaged in creating it. A draft was presented to them, discussed, and then agreed upon.
Building excitement	A group setting provided a space to share enthusiasm needed for organizational change. Participants saw the commitment from senior staff and built upon each other’s ideas.	A workshop is good way to focus on the topic on one point at a time. Outside of the workshop it was challenging to command full participation.

3.2 Entrepreneurs’ shift in thinking

Research question:

How does Inova entrepreneurs’ understanding of sustainability demonstrably evolve after exposure to Strategic Sustainable Development?

Entrepreneurs working with SSD:

- Gained a new perspective on their business development.
- Identified new ideas, such as new product, value chain engagement, business model, and partnership opportunities.
- Demonstrated commitment to further exploration of sustainability in the company.

3.2.1 Templates for Sustainable Product Development for start up companies

The TSPD method was used with three entrepreneurs. The three were chosen based on time availability, and based on their varied placement at different stages of incubation (newly accepted into Business Development = SU7, established in Business Development = SU1, and Growth stage = SU4). The way in which the TSPDs were applied was also slightly different in each case so as to better test the tool each time it was applied. For example, as feedback was received that it was difficult to understand the new concepts in English, the text was translated to Swedish for the remaining two companies. The table below illustrates how the TSPD method was used in each case.

Table 3.2. Varying conditions for TSPD method

	Sustainability awareness building (presentation)	Language Used	Level of Template detail	Stage of incubation
SU1	Participated	English/ Swedish	General, no examples used	Business development
SU4	Participated	Swedish	Somewhat product specific, examples used	Growth/leaving incubator
SU7	No, just brief presentation for the company board	Swedish	Somewhat product specific, examples used	Recent analysis, newly accepted into business development

Key findings:

- TSPD method was successfully used with start up companies in a business incubator setting.
- The support of business coaches throughout the process was critical for the entrepreneurs. They were able to ask questions, and brainstorm creatively with the coaches.
- TSPD guidelines were clarified the process. Visual support, such as a flow chart of the questions enriched the guidelines.
- The TSPD method required thorough reflection on the entire company. The use of the entrepreneur's native language was more efficient for understanding sustainability.
- Information provided by “sustainability experts” should be clear and explanatory. Prior training on the basic sustainability concepts and practice using the four sustainability principles increased the effectiveness of the TSPD method.
- The format of the templates influenced understanding. The researchers had the most success with presenting a Guidelines document followed by the TSPD with expert's responses in a word document format. Delivering information in a spreadsheet format was perceived as confusing.
- Entrepreneurs were able to identify connections with familiar business planning tools.

3.3 Sustainability Integration

Research question:

How could Strategic Sustainable Development be integrated into the processes at Inova?

Below is a diagram to show where specific tools could be introduced in Inova's current incubation process. The grey boxes dictate where in the process the recommended tool is used.

This approach is designed to complement current processes, while integrating a sustainability approach into existing incubator development methods (workshops, presentation meetings, strategy making). In this model the coaches/staff of the incubator act as a support system. The entrepreneurs are ultimately responsible for applying concepts and strategies to their businesses. While the concepts associated with SSD were new and sometimes complex, the more often staff and entrepreneurs applied SSD methods to a topic of relevance, like their businesses, the more useful it became.

To fully understand the process recommendations it is necessary to refer to the SSD tools section 2.4. Additional resources for the implementation are available there too, as it may be necessary to look beyond the structure provided here to build a process that is applicable outside of Inova.

Figure 3.2. Introduction of SSD tools in the incubation process

3.3.1 Screening stage

Engaging sustainability through triggering questions

Purpose Add questions to existing screening process which measure the entrepreneur's overall awareness and willingness to engage sustainability in the future.

Suggestion Open ended questions, which encourage discussion, are preferable.

Screening Questions:

- What does ultimate success look like for your business?
- How will society benefit from your business?
- What are the potential environmental and social impacts of the business? What risks and opportunities do you see?

Sustainability awareness building

Purpose Build awareness and basic understanding which answers 1. What is sustainability? 2. Why is it important for business? 3. What opportunities exist? 4. How can sustainability enrich business development?

Suggestion Sustainable development covers an immense range of topics for businesses³. Entrepreneurs require a thorough introduction of sustainability which should include;

- A basic understanding of the earth's bio-geochemical cycles and natural laws, in relation to human society (system).
- A principled definition of sustainability to guide complex decision making and analysis in the future (success).
- Examples of businesses engaged in sustainability initiatives can paint a clearer picture for entrepreneurs, connecting with their experience (actions).

³ See SSD Tools section 2.4.3 System/Success level of Five Level Framework for topics to cover and useful references.

3.3.2 Analysis stage

Backcasting using ABCD methodology

Purpose Backcasting provides an opportunity for the entrepreneur to think long-term about a company vision that incorporates an understanding of sustainability. Identification of unforeseen opportunities and threats such as access to material, cost of energy, and information flows, will assist the incubator in deciding which businesses to accept.

Suggestion

- Apply ABCD method⁴ to the entire company
- For maximum creativity, conduct a group strategy session with all business partners and business coaches involved.

3.3.3 Business Development stage

Templates for Sustainable Product Development

Purpose The TSPD method⁵ poses questions to encourage overarching analysis of the product/service from a sustainability perspective. Its use early in the Business Development stage can create new market ideas, inform conceptual product design, and/or alter the business model.

⁴ Use ABCD method outlined in the SSD Tools section 2.4.2 for specific details.

⁵ See TSPD process description in SSD Tools section 2.4.4.

Suggestion

- Include all business partners in this process to increase creativity and spur significant changes in the business idea.
- It is more important that the sustainability experts are familiar with the method itself. Familiarity with the specific business concept being analyzed is of secondary importance.
- The outcome of the TSPD method can be used as a sustainability SWOT analysis, providing insight for overall business development aligned with the sustainability principles.

Monitoring business development towards sustainability

Purpose Tracking the generation of new ideas from the TSPD method to implementation will create an understanding of successes and challenges, informing future decision-making (e.g. financial implications of choosing renewable materials, logistical considerations for supply chain management, etc.).

Suggestion Utilize the TSPD method to expand the advisory network of the incubator and create new partnership opportunities for the companies (e.g. engagement with the university, investors, corporate mentoring, research/design, etc.). The incubator can specifically:

- Monitor the costs and benefits of sustainability initiatives with companies.
- Compile best practices and useful tools.
- Promote internal success stories frequently.

3.3.4 Growth stage

Building the network through alumni engagement

Purpose As companies leave the incubator they become success stories. Those that have succeeded in implementing and benefiting from integrating sustainability can inspire others.

Suggestion The incubator can build organizational capacity by maintaining relationships with entrepreneurs after they leave the incubator. Business leaders could add value by:

- Mentoring other start up companies.
- Leading discussions on sustainability and innovation.
- Increasing sphere of influence through regional partnerships, public promotion of sustainable development, and advocacy.

4 Discussion

The research questions for this study were designed to identify ways to integrate sustainability into Inova's processes. We felt that by introducing the FSSD and the TSPD method and measuring reactions of both the business incubator and the start up companies we could determine the usefulness of the tools, suggest changes to make them more applicable to start up companies, and recommend process integration for Inova. The results show a documented shift in thinking about how sustainability can be integrated at Inova and about the value it brings to the business development of start up companies. Our results indicate that the TSPD method could contribute substantially to sustainability assessment carried out in the future at Inova.

The following discussion provides an in depth assessment of the use of the TSPD method for start up companies and service organizations (like an incubator). We begin with our insights into *how* the start up companies came to experience a shift in thinking on sustainability. Then, we'll consider how that shift will affect Inova's interactions with companies. Finally, we discuss the implications of our general methodology.

4.1 Templates for Sustainable Product Development for Inova

The TSPD method was used to facilitate the creation of a sustainability strategy for the start up companies. The general goals for the TSPD method are to:

- Bridge the competence gap between sustainability expert and client.
- Facilitate discussion and decisions between various levels in organization.
- Influence the organization's long-term ability to find improvements in product/service that are relevant for SSD.

A research specific goal was added:

- Test the TSPD method on a service-based organization.

The discussion reflects upon these goals as they appropriately frame how understanding of staff changed while using the TSPD method.

4.1.1 Bridging the competence gap between sustainability experts and Inova

- The TSPD method was accompanied by other tools, such as an introductory A-awareness presentation, which was intended to build a common understanding of sustainability among all participants. However, it was during the TSPD workshops that participants began discussing important questions, including:

What is a business good for, how does it contribute to societal welfare?

What is the scope of Inova's influence? Where is the boundary? How far can we go?

What are sustainability principles? How can we reword them into language that is meaningful—to us [Inova] and the start up companies—so that businesses are not intimidated?

The interactive setting of the workshops facilitated brainstorming amongst participants. From the first presentation, discussions of the implications of sustainability for business increased staff understanding of the concepts. It also increased the coaches' ability to add value when the entrepreneurs used the TSPD method. In the end all participants felt that their understanding of sustainability had increased but still felt they needed a concrete strategy for moving ahead with integration with the companies.

4.1.2 Facilitating discussion and decisions between various levels in organization

The incubator does not have a complex hierarchical structure. The cross departmental team of staff included coaches, process manager, communications, and incubator director. The TSPD method was most useful in bringing key staff together around a common goal, thus facilitating discussion between various levels of the organization. We would recommend that as many staff as possible take part in creating an organizational strategy around sustainability. The workshop setting in particular creates an inspiring dynamic for organizational learning.

4.1.3 Influence the organization's long-term ability to find improvements in service which are relevant for SSD

The following significant outcomes were attained while working with the TSPD method:

- Staff understanding of sustainability increased, as did their realization about the complexity and urgency, and the need for a principle-based approach, and a backcasting perspective.
- Staff shared a clearer sense of responsibility for increasing entrepreneurial awareness about sustainability from the earliest phases of incubation.
- Defined a need to “walk the talk” (i.e. take actions that are consistent with sustainability principles).
- Inova started drafting a sustainability strategy.
- Inova added a new element addressing sustainability to their vision.
- Day-to-day decision-making and interactions with entrepreneurs have been affected.

Overall, our data supports the finding that Inova has made a long-term commitment to becoming a sustainable incubator. The participants agreed

on the importance of the first steps and expressed need to carry on with the transformation process.

4.1.4 Test the TSPDs on a service based organization

The TSPD method with Inova was slightly different than originally intended. The main differences were:

- Workshop format

The format for communication employed a workshop setting rather than written feedback. Participants' feedback on the workshop setting was positive, although some improvements were suggested. For example, it was not clear if the workshop was intended to increase creative discussions or to produce very strictly defined outcomes. It was stressed that the workshop setting allowed for creation of a shared understanding, which would have been more difficult to achieve through written interaction. It would have been useful to divide the focus of the workshops into Visioning, TSPD method, and Down to action. The tight time constraints for the workshops were a significant obstacle to achieving the goal of creating a strategy for implementation. In the end this was not achieved. Inova does have a good start, but will need to revisit the template ideas and create a working strategy. It is our hope that the sustainability integration process will act as an adequate guide to that end.

- Questions adjusted

The template questions in the TSPD method were adjusted slightly for use with a service-based organization. It was a matter of wording that is originally used for product development that had to be adapted for Inova. Experience showed that rewording the questions did not significantly change the overall understanding of the participants.

4.1.5 Recommendations for use of the TSPD method with service-based assistance organizations

The TSPD method can be useful when creating a sustainability strategy for an organization like the incubator. The following should be considered:

- The organization should have an agreed upon vision for sustainability, and well defined next steps for how to use information from the templates to create a strategy plan. The templates in themselves do not clearly define actions to take or guide prioritization of ideas.
- A workshop setting is a valuable way to engage various levels of the organization and build a shared understanding and commitment. However, adequate time should be allowed for discussion since the topic is complex and understanding cannot be rushed.
- An adequate level of training on the basic concepts of sustainability should be provided before any strategy making occurs. It is most productive if all staff are given the opportunity to apply the concepts of backcasting from sustainability, the four sustainability principles including the nine human needs, and the five level framework for planning and decision-making in complex systems.

4.2 Inova staff's evolving understanding

4.2.1 Gaining a broad perspective and deeper understanding

As a result of working with SSD, Inova has developed a broader perspective on how sustainability affects start up businesses, and Inova's internal processes. This understanding will help guide future decisions about when and how to engage the start ups. The research team and Inova's Process Manager identified a need early on to build a shared sustainability understanding within the staff. It was felt that if SSD could be used to do this, then staff would be motivated to identify and take further concrete actions. By the time the first workshop was held, a few weeks after the introductory presentation, staff had already begun to view current projects using their sustainability understanding. One coach recalled using the

sustainability principles when reading business plans and asking questions to companies at the analysis stage of incubation (Bångerijs 2007 March 16). Another has since noted that “The biggest success is that I do take sustainability into account in another way than before and that I will address the subject in connection to all new ideas that are presented to me” (Lööv 2007 April 4).

As staff began to analyze Inova’s vision, current sustainability impact, and future actions to take, a broader view of Inova’s responsibility toward sustainability emerged. This sudden widening of perspective encouraged creativity and triggered much discussion on the appropriate boundary of responsibility. All final evaluations received from staff identify this shift in understanding as the biggest success of the research, “...and I think that is the main goal of the work that you have helped us with, it [sustainability] is a natural part of our thinking and I think that is the greatest achievement in our work so far” (Isaksen 2007 April 7).

4.2.2 Evolving priorities

Concrete action to move Inova toward its new vision was not clearly defined by the end of the research period. The goal of the final workshop was to expand on actions from the Inova TSPD method (Appendix G), and begin prioritizing them using the guiding questions for strategic planning. Unforeseen circumstances decreased the number of workshop participants, and it was not possible in the amount of time allotted to identify adequate action items.

Inova’s new priorities are to i) translate sustainability into language and examples that speak to business ii) identify external experts to support start up companies iii) gain an appropriate staff/coach competence level and, iv) develop a strategy for full implementation, See Results 3.1 for a more detailed explanation of the priorities. We believe the following factors were essential elements triggering the shift in priorities:

- Building a common understanding allowed Inova to more confidently move ahead in their strategic planning.
- Inova’s Steering Committee is discussing the implementation of the new sustainability vision.

- Entrepreneurs were willing to work with the research team and gain new insight from the experience.

4.3 Templates for Sustainable Product Development for start up companies

In the next sections, fulfillment of the research goals for the TSPD method are discussed to show how sustainability understanding evolved among entrepreneurs.

4.3.1 Bridge the competence gap between sustainability expert and entrepreneur

One major goal of the TSPD method is to increase the sustainability competence in businesses. Our research has shown that start up companies can benefit from this method. There is a challenge for the sustainability expert to provide a clear template answers with enough information to be clear and at a detailed enough level to stimulate new ideas from the entrepreneur. We learned from our experience giving the companies comprehensive information that, while this was appreciated, it was perceived as if all actions and solutions had been identified, which stifled creativity.

4.3.2 Facilitate discussion and decisions between coaches, entrepreneurs, and sustainability experts

The TSPD method achieved the goal of facilitating discussion amongst partners within the company. From our experience it was common that people in the same company had different attitudes about how sustainability could add value to their business. In the future, all partners working with the TSPD method could raise important questions about the larger role of the organization in society.

The TSPD method also facilitated idea creation between the entrepreneurs and their coaches. The TSPDs seem generic enough to be applied to various kinds of products. The templates could be usefully applied to the entire company model, as was done with Inova. However, distinguishing the topic of analysis (company's product from company itself) is necessary.

4.3.3 Complementing current strategy tools

Generally, staff and entrepreneurs agreed that the TSPD method was complementary with other tools they use during business development. Participants could see synergies between product design tools as well as general planning tools like a SWOT analysis.

The TSPD method was also said to add a sustainability overview to commonly addressed business areas such as market need and product concept. We feel that this perception makes the TSPD method especially promising for future use with start up companies. The incubator expressed a desire to integrate sustainability rather than adding it as something new for entrepreneurs to struggle with. The results from the TSPDs and subsequent feedback seem to support this desire well.

4.3.4 Provide new insight on future opportunities/benefits

From the beginning, incubator staff seemed uncertain whether entrepreneurs would perceive planning from a sustainability perspective as a way to add value to their businesses. The TSPD outcomes were closely related to the third research question; How does Inova entrepreneurs' understanding of sustainability demonstrably evolve after exposure to SSD? If it had turned out that the entrepreneurs did not generate any new ideas from working with the TSPD method, it could have impacted the overall value of the entire process. The TSPDs generated concrete ideas which allowed the entrepreneurs to see the value of the method. The content of the sustainability experts' answers played an important role. Specific examples of how a company can avoid violations of the sustainability principles or take advantage of opportunities can stimulate creativity. Some examples given included:

- Use a service-based business model rather than a product-based business model.
- Build cooperation within the supply chain to gain access to more sustainable material inputs.
- Market products/services as contributing to a healthy lifestyle.
- Identify market niches that could be fulfilled through sustainable product innovation.

4.3.5 Applicability of the Templates for Sustainable Product Development in start up companies

The TSPD method facilitated discussion amongst sustainability experts (researchers), entrepreneurs, and business coaches. In future applications of the TSPD method, outside experts would bring needed sustainability competence, and coaches would act to supportively guide the entrepreneurs through the TSPD process. As with all topics, the coaches need a working understanding of the topic in order to add value to the process.

Additionally, the following formatting factors are important:

1. Language

Information given in a non-native language created a slight barrier to the understanding of questions and answers. This was caused by the fact that the research team's working language was English. Although all involved entrepreneurs and staff understood English satisfactorily, it was still more effective for them to communicate in their native language.

2. Wording of questions

The original wording of the TSPDs was used. One participant perceived the questions as too academic, making the meaning unclear. The questions could be rephrased for clarity. Some were perceived as asking Yes/No which was not engaging.

3. Participation

All business partners should be engaged in strategy making. During the research the TSPD method was tested with only one representative from each company. This was perceived as a barrier to building shared understanding in the company, creating a need for further education and backtracking with the other business partners before a strategy could be developed.

4. Understanding

When using the TSPDs with one entrepreneur the expert input was very general. Specific examples were not given. With the other two entrepreneurs, a richer level of product specific details and examples were added. Those with more examples expressed specific appreciation about the level of detail, while the first entrepreneur struggled to understand the meaning. The examples seemed to increase understanding significantly.

Supplementing the TSPDs with guidelines for their use, (including examples of violations of sustainability principles and human needs) was a useful support tool for coaches and entrepreneurs.

5. Interaction

The entrepreneurs and coaches should take time to read and understand the sustainability experts' ideas thoroughly. The entrepreneur's role is to then comment on the expert answers and add his/her own ideas. The TSPD method should facilitate an approach to provide space for the entrepreneur to answer.

6. Time constraints

We suggest that the TSPD method should be completed within three weeks (this includes initial training on how it is used, sustainability expert answers, entrepreneur's feedback and responses, final report and next steps discussed among the expert, entrepreneur, and coach). A much longer process may affect positive momentum. Time constraints are especially challenging in the early phases of a company's development. However, the TSPD method should be perceived as a necessary contribution to the long-term strategy.

4.3.6 Recommendations for future use of the TSPDs with start up companies

- Provide a training session for all coaches and guide them through the TSPD method for start up companies.
- Encourage coaches to share their experiences along the way and support each other.
- Coaches should devote an appropriate portion of their time for preparation (e.g. collecting company information and understanding guidelines and basic concepts).
- Entrepreneurs and coaches should be educated beforehand on using the four sustainability principles and nine human needs. Specific examples of how to work with these concepts will strengthen understanding.
- Develop visual support to explain the TSPD method and basic concepts.
- Templates I and III can inform market analysis, but it also seems necessary for a company to understand its market before engaging in the TSPD method. A reiterative process may be ideal.

4.4 Entrepreneurs' evolving understanding

4.4.1 Gaining a new perspective

After using the TSPD method, the entrepreneurs generally agreed that an understanding of sustainability and associated business benefits and risks of sustainability planning is important for their business development. This is not a surprising finding since Inova staff chose the entrepreneurs we worked with based on their stage in incubation and potential openness to be part of the research process. Staff also worked closely with the three entrepreneurs on the TSPD method and strove to increase their

understanding of the tool being used. Staff had a role to motivate and inspire, which likely increased the effectiveness of the process. One coach commented that upon receiving the template analysis he had to ask himself if he agreed with what the research team had proposed. He knew that if he did not understand or support what was written, the entrepreneur would sense this and the outcome might have been affected (Lööv and Bångerijs 2007 April 10).

The entrepreneurs' shift in business perspective is visible in survey results (see also visualization on the Sustainability Learning Curve in Appendix E) as well as comments received in interviews.

Before being exposed to SSD the three entrepreneurs collectively identified the following as the most important sustainability issues for their businesses;

- Avoiding costs through minimizing waste (both emissions and solid).
- Choosing the right material inputs.
- Analyzing the company's operations with a broad perspective and identifying effects on both the global human society and nature.

After receiving an introductory presentation and working with the TSPD method the entrepreneurs answered the survey again. This time they added value to a larger number of issues on the survey. The following issues were given a higher value in the post survey:

- Integrating sustainability into every aspect of the company's operations.
- Choosing business solutions that are not environmentally and socially harmful in the first place.
- Using environmental aspects in marketing and public relations.
- Meeting legislative environmental standards regarding pollution.

Having a broad perspective fell out of the top four most important issues in the post survey. This can be attributed to the overall increase in value

assigned to other issues since the broad perspective was not valued differently in the post survey. Further, the new issues are generally more specific. This could have occurred because this survey was conducted after the entrepreneurs had focused on a thorough analysis of their specific products. Comments received in interviews support the claim that the companies gained a broader perspective about their company in regards to sustainability.

- “The issue is complex, it isn’t hard to understand but it touches so many parts of the company...I have a wider view of the problem now, which is good.” (Co-founder of start up company 1 (SU1). 2007 April 4)
- “We are a new company, can we afford to be on the cutting edge, or can we afford to wait?” (Co-founder of start up company 7 (SU7). 2007 April 4)
- “The social component is an important part of sustainability; it isn’t just about materials you choose, it is also important to have the social thinking. I hadn’t thought about that before.” (Co-founder of start up company 1 (SU1). 2007 April 4)

4.4.2 New ideas and next steps

After working with the TSPD method the entrepreneurs had new insights on their own products and business processes. The companies were in various stages of product development but all had prototypes of their products. One of our goals was to generate new product or service ideas using the lens of sustainability. Given the short time that the entrepreneurs had to reflect on the templates, and the newness of their sustainability understanding, the ideas created are seen as an adequate beginning.

Product and company insights included:

- Using eco-labeling to promote sustainability of product in the future (Co-founder of start up company 4 (SU4). 2007 April 4).

- Conducting more thorough market analysis to assess the importance of sustainability aspects to potential customers (Co-founder of start up company 4 (SU4). 2007 April 4).
- Developing sustainability standards for suppliers (Co-founder of start up company 7 (SU7). 2007 April 4).
- Exploration of a service-based model of current product (Co-founder of start up company 7 (SU7). 2007 April 4).
- Pursuing a research partnership idea with the university to assess nutritional value of product in relation to fast food (Co-founder of start up company 7 (SU7). 2007 April 4).
- Incorporating a human needs/social aspect in business planning (Co-founder of start up company 1 (SU1). 2007 April 4).

Receiving feedback that sustainability was important to their long-term planning was not unexpected. However, entrepreneurs also expressed a commitment to using their sustainability insights in the future.

1. All three entrepreneurs would be reporting back to an Inova coach or their business partners.
2. One entrepreneur expressed interest in using the sustainability principles to guide new product development in the future (Co-founder of start up company 1 (SU1). 2007 April 4).
3. One entrepreneur expressed a strong desire to engage his business partners and planned a workshop on sustainability within one month (Co-founder of start up company 7 (SU7). 2007 April 4).

4.5 Discussion on proposed process changes

4.5.1 Research team

This sustainability integration process is only one of the possible ways the incubator could use to accomplish their goal of becoming a sustainable incubator, helping to develop sustainable business ideas. The approach, as

outlined here is linear, whereas we recognize that both the incubator's processes and the realistic use of the tools can be dynamic.

Screening stage

The staff expressed a desire to solidify a cohesive sustainability message in order to communicate their commitment to sustainability with entrepreneurs and external partners.

Screening questions are not meant to represent a sustainability filter. They are proposed to add value (e.g. richness, broader perspective) to current screening questions. For entrepreneurs, the screening questions may lead to further examination of the business idea and its impact on socio-ecological system. The questions should help build understanding by triggering new ideas to incorporate sustainability into the very beginning stages of business idea development.

Analysis stage

When introducing sustainability, examples of opportunities and stories of success may orient entrepreneurs toward more creative and positive thinking about their business development. Additionally, grounding the business' definition of success in the four sustainability principles can stimulate new ideas and strategies about how to integrate sustainability.

Business development stage

The TSPD method is used at the business development stage. This stage seems to be the best place for thorough business analysis. The companies are researching and business planning, gaining competence in diverse areas, and gathering information about the market. The TSPD method may occur early in business development and be revisited throughout. The search for partners, funding, and relevant sources for sustainability information could support ongoing progress.

Growth stage

Utilizing the experience of companies that have completed incubation is essential. The learning loop for Inova can be rounded by experience coming from alumni companies operating in the market. Inova is already working to improve communication here, and a sustainability focus will fit well.

4.5.2 Validation from Inova and external partners

Research results were validated by Inova staff and two external experts in entrepreneurial business development. The external experts were asked to reflect on our proposed sustainability integration process, and offer insight into its applicability to their organizations.

Dick Eriksson, vice managing director, Innovationsbron Väst AB

Eriksson is the vice managing director of the incubators' network in western Sweden, of which Inova is a member. His reflections of the results were collected in an interview (Eriksson 2007 May 14). Eriksson's key comments were:

- Wider applicability of sustainability integration in the incubator network is possible. Since the incubation process among the incubators is very similar there are no obstacles to application of proposed generic model. It is becoming more and more obvious that sustainability is a field of knowledge where incubators need the best external expertise available.
- Incubators need a role model for sustainability integration is needed. Inova can become a pioneer in this field and share its experience with others, further promoting strategic sustainable development.
- Incubators need to communicate very clearly what they offer. When integrating sustainability it should be clear to applying businesses and community how this can add value.

Mikael Johansson, business developer, counsellor for start up/early phase companies, Coompanion Kooperativ Utveckling Skåne

As a start up business developer, Johansson offered a review of SSD tools and the integrated process proposal, and gave feedback in a telephone interview (Johansson 2007 May 11). Coompanion is not an incubator, but similarities in start up support mechanisms were found. Johansson's key comments were:

- Wider application of backcasting would be beneficial in developing business ideas, and should be uniformly applied.
- The importance of introducing sustainability at an early stage was stressed, and compatibility of the thesis results with Coompanion's processes was found. The triggering questions proposed for the screening stage and questions asked in the survey (part B) were found to be very similar to the ones already used. It was felt that questions like this should become a part of the daily work of coaches and business developers. Helping businesses to reach new markets, providing people with meaningful work and aiding businesses in meeting supply chain requirements are attractive ways to show positive benefits of planning sustainably. The thesis outcomes were stated to be useful for support organizations' operations and should be made available to them.
- Applying the Five Level Framework in a business context is very appropriate. The system, success, and strategy levels especially add value in guiding companies planning.
- Research outcomes can be useful for Coompanion to help raise awareness for entrepreneurs and help articulate the business case for sustainability. Some of the proposed tools (e.g. ABCD methodology) and questions are seen as applicable to Coompanion. It was felt that a level of competence would need to be established before the TSPD method could be used, since it didn't seem accessible without training or more information.

Inova staff: Victor Isaksen, managing director; Britt Lööv, process developer; Ann-Sofie Holm, Helena Wikteliuss, and Patrik Bångeriuss, business coaches.

Inova staff feedback was collected at a workshop where the research team presented their work and introduced the sustainability integration proposal to Inova. The research results corresponded well with Inova's experience and were appreciated as relevant for moving towards sustainability integration in the incubation process. The staff's key comments were:

- System thinking was proven to be a very valuable way to acknowledge the broader perspective of a businesses operations and

the role of business in society. The Five Level Framework was appreciated to guide sustainability strategy development.

- Backcasting will be used at Inova, not just as a strategy to arrive to sustainability but also as a planning tool for business visioning. Introduction of backcasting to entrepreneurs from the very beginning was perceived as a main mechanism to trigger their thinking around the role of business in society.
- Inova found backcasting and the TSPD method to be the core elements for their integration. The two would complement each other and could be used in both the analysis and business development stages.

4.6 General methodology discussion

General research methods such as observation, document analysis, interviews, and surveys were used throughout the study. Here, the design of the survey and the use of the SLC are discussed.

The SLC was used to demonstrate change in the entrepreneurs understanding regarding sustainability. The results show that there is a dissonance between what entrepreneurs think they are doing and what they would like to do. The validity of the SLC as a way to gauge change is dependant on the validity of the survey itself, discussed below.

The survey design followed guidelines generally used in science (Oppenheim 2001, 7-8). It was necessary to use the survey in conjunction with entrepreneurial interviews in order to validate the information provided.

Section A

The entrepreneurs were asked to provide a broad definition of sustainability in an attempt to draw out their thoughts on the relationship between sustainability and their businesses (see Appendix B).

The original wording was “Please describe briefly what the concept of sustainability means to you” and “Describe also how you relate to sustainability in your business” was added as a second part.

The question was changed after surveying Inova staff and four entrepreneurs. Three more entrepreneurs answered the question in its edited version.

The section was hard to analyze (keywords identification used) because respondents gave a wide variety of answers. Assigning a definition of sustainability to one of the stages in the SLC was therefore highly subjective.

Section B

The entrepreneurs were asked to choose their closest association with an environmental policy statement. When the pre and post survey results were compared, there was not a significant difference in answers. In our opinion, this could be caused by the use of broad categories, which did not measure slight changes. The term “environmental policy” instead of “sustainability approach” was used intentionally to relate to common language.

Section C

Quantified results were produced for comparison. In some cases, the value assigned to one item decreased in the post survey. We attribute this phenomenon with a broadening view of entrepreneurs and therefore re-assessment of their priorities (in positive and negative direction). An increased understanding of the issues could also cause re-evaluation of importance. To avoid influence of the “human factor” when providing answers to the same questions (i.e. answers can differ when respondents do not remember exactly how answered the first time) we provided the pre-survey answers to inform post survey answers. In our opinion this improved the validity of the results. Additionally, we feel that the answers to the post survey could have been influenced by the interview session and discussion of the TSPD method, which preceded the post survey completion for two of the entrepreneurs.

5 Conclusions

5.1 Incubators guiding entrepreneurs to identify risks and opportunities

We can conclude that:

- Inova staff and entrepreneurs, working with SSD, began to develop:
 - an understanding of business' dependence on and relationship to broader societal and ecological systems; and
 - an ability to use backcasting from the basic socio-ecological principles of sustainability in business planning.

In turn they experienced an increased capacity to identify sustainability-related business risks and opportunities.

This evolving understanding and ability was validated by Inova staff and entrepreneurs.

- SSD can be integrated into a business incubation process using the suggested tools. As a result of the work, Inova is committed to moving forward with the implementation of the proposed integration of SSD into the incubation process. The proposed integration process is designed to be specific to Inova's internal processes, yet general enough for similar assistance organizations to gain insight.

We feel that the tools tested fit best in the proposed order as they follow a logical learning curve and allow for development of understanding and increasing complexity of analysis of one's business.

- Inova and similar entrepreneur assisting organizations provide a useful arena in which to promote SSD. Business owners have a key role to play in our global journey toward sustainability,. They are community members, teachers, suppliers, and economic drivers. Organizations like Inova have a tremendous opportunity to add a

visionary value, connecting business ideas to their core societal purpose. Businesses exist to meet the needs of human society, without undermining the regeneration of life sustaining natural systems.

5.2 Suggestions for further research

It would be useful for a longitudinal study tracking the progress of visionary sustainability leaders from start up to be conducted.

Additionally, the following four areas could be further explored:

1. From start up company to successful business: What long-term value do business leaders see as a result of planning guided by SSD?
2. From separate to integrative tools: What will the integrative tools look like in a business incubator heading for SSD?
3. From separate to a common language: How will the language and terminology associated with SSD evolve to speak directly to businesses?
4. From the Swedish case to the international arena: Will integration of SSD into other business incubation processes around the world differ? How can experience be shared among the family of business incubators redesigned towards sustainability?

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Appendices

Appendix A: Sustainability Learning Curve

Appendix B: Survey design

Appendix C: TSPDs, questions for entrepreneurs

Appendix D: TSPDs, guidelines for entrepreneurs and coaches

Appendix E: Sustainability learning curves for entrepreneurs

Appendix F: TSPDs, questions for Inova case

Appendix G: TSPDs, Inova case answers

Appendix A: Sustainability learning curve

Appendix B: Survey design

Note: This survey was provided in Swedish and has since been translated to English for this paper.

Name:

A. Please explain briefly what the concept of sustainability means to you. Describe also how you relate to sustainability in your business.

B. Which statement (please check one) do you think corresponds best to your company's environmental policy?

☐1. For my company it is important to meet all regulatory requirements concerning environment. This is what I should do and what I am responsible for.

☐2. I see a potential in engaging my company in some other activities going beyond compliance with environmental legislation. These voluntary acts will improve my company's image in the eyes of customers.

☐3. There are definitely benefits that my company can reach by proactive environmental approach (to act in advance rather than reacting to environmental problems). I also recognize the present risks of doing nothing and being follower of others. I want to lead the way in environmentally responsible business making. For this I am planning deliberately.

☐4. Environmental and social aspects are integrated into a sustainability approach and are core values of my business. Without this approach the whole business idea would be essentially changed.

☐5. I have not thought about this

C. How important are the following items to your business planning and decision making? (please circle one number for each question)

1=Not at all important

2=Somewhat important

3=Important

4=Very important

5=Very much important

0= Have not thought about that

1. Meeting legislative environmental standards regarding pollution.

1 2 3 4 5 ☐

2. Avoiding costs through minimizing waste (both emissions and solid waste).

1 2 3 4 5 ☐

3. Using environmental aspects in marketing.

1 2 3 4 5 ☐

4. Staying ahead of new legislative environmental standards.

1 2 3 4 5 ☐

5. Having a systematic approach for assessing opportunities and threats concerning environmental issues.

1 2 3 4 5 ☐

6. Thinking of environmental aspects when developing new products and services.

a. Choosing the right material

1 2 3 4 5 ☐

b. Reducing material input

1 2 3 4 5 ☐

c. Choosing the right energy source

1 2 3 4 5 ☐

d. Reducing energy input

1 2 3 4 5 ☐

7. Integrating sustainability into every aspect of the company's operations.

1 2 3 4 5 ☐

8. Learning from nature when designing new products and services.

1 2 3 4 5 ☐

9. Choosing business solutions that are not environmentally and socially harmful in the first place.

1 2 3 4 5 ☐

10. Looking at the effects of my company's operations in a broad perspective – effects to both the global human society and nature.

1 2 3 4 5 ☐

Thank you for your time! If you finished earlier than others we provide a brief outline of the workshop agenda on the back of this page.

Appendix C: TSPDs, questions for entrepreneurs

I. Market Desires/Needs	II. Concepts	III. Extended Enterprise
Current market desires addressed	Conceptual design of today's product	Current stakeholder cooperation/communication
What <i>current</i> market desires is the product/service intended to meet?	What current flows and management routines from the life cycle of the chosen product/service concept are critical from a sustainability perspective?	What current preferences and conditions of societal stakeholders are opposing the introduction of more sustainable product/service concepts? Is the company trying, through external communication and actions, to change these conditions? How?
What are some <i>current</i> overall sustainability problems related to these market desires?	In other words, what critical violations of the sustainability principles could be identified for the following general life-cycle phases? Resources extraction, supply chain & manufacturing distribution and use final disposal or reuse recycling/ land-filling	What current product/service value-chain cooperation is agreed upon and what gaps can be identified that prevents responsible handling of sustainability problems throughout the lifecycle?
How do these market desires relate to basic human needs?		
How do these market desires relate to basic human needs?		
Future needs to address	Likely conceptual design of future product:	Likely future stakeholder cooperation/communication
What <i>new</i> market desires are likely to evolve in the future in response to sustainability challenges?	Could physical flows, management routines, etc., related to the current life-cycle of the product concept be developed to reduce the risk of societal violation of the basic sustainability principles? In other words, what solutions to product-related sustainability problems could be identified for the following general life-cycle phases? Resources extraction, supply chain & manufacturing distribution and use final disposal or reuse/ recycling/ land-filling	What future societal stakeholder preferences and conditions would be particularly favorable for the development of more sustainable product/service concepts, and how could the company interact with external stakeholders to facilitate such change?
What <i>new</i> market desires, related to your core business, could improve chances of fulfilling basic human needs?		
Are there market trends that point in this direction?	Could new product/service concepts be developed that meet the current and/or future market desires while reducing the risk of societal violation of the basic sustainability principles?	What future strategic product/service value-chain cooperation would be particularly favorable for responsible handling of sustainability problems through-out the lifecycle? How could the company develop such cooperation?

(Ny, 2006)

Appendix D: TSPDs, guidelines for entrepreneurs and coaches

The Templates for Sustainable Product Development (TSPDs) aim to increase the success of innovative start up companies. The method and a great deal of the subsequent documents are based on research currently underway by Sophie Byggeth and Henrik Ny, doctoral students at the School of Engineering at Blekinge Tekniska Högskola, Sweden. The TSPD method used by start up companies should:

- Apply strategic sustainability to existing or future product/service concepts
- Complement current strategy tools
- Provide new insight on future opportunities/benefits

All business activities that are successful in the future are sustainable. Today all organisations are part of a non sustainable development where the room for health, welfare and good economy is ever diminishing. An organisation is sustainable when it no longer depends on contributing to an ecological and social un-sustainable development. The sustainability principles make up the frame within which an organisation must stay when it is socially and ecologically sustainable. The sustainability principles are the same for all organisations. The four sustainability objectives for an organisation are to:

- 1...eliminate its contribution to systematic increases in concentrations of substances from the Earth's crust.
2. ...eliminate its contribution to systematic increases in concentrations of substances produced by society.
3. ...eliminate its contribution to systematic physical degradation of nature.
4. ...eliminate its contribution to the systematic undermining of human's ability to meet their needs

Understanding what sustainability means to society and to one's own business gives support to identifying opportunities, strengthen competitiveness, make economic savings and reduce long term risks. The great reward of profitability often comes to companies that foresee challenges ahead and create an opportunity. Recognizing internal strengths and weaknesses in regards to materials and energy used, and in common management routines can help companies understand how costs of materials can be expected to rise in the future. Thus a compelling reason to look for alternatives early in the development process may arise. Businesses that regularly assess their external opportunities and threats discover new partnerships, capital options, and foresee market changes ahead of competitors. Recognizing how regulations will affect a product's design in the future will better inform the design from the beginning, thus saving time and money later on.

This strategy tool should inform short and long term goals of the organization, and it can also help to generate totally new concepts/ideas that haven't been thought of before.

Template process:

1. Start up company receives some level of sustainability training
2. A sustainability expert generates generic responses to template questions
3. The start up company works with a coach to respond to the expert's responses
4. The expert then gives feedback on the responses of the company and coach.
5. Finally a summary report is delivered to and discussed with the company and the coach.

Short and long term options will all be considered here and the process is intended to generate creativity. Constraints of economic feasibility are sorted out at later stages.

Tips to think about while going through the template

- Read through the whole text and all questions before adding reflections. It is essential to have the full context of the document.
- When formulating answers think of how the company is currently dealing with the issues in comparison to the expert's general view.
- In answers aimed at the future scenario, think of how you plan to deal with the issue in the short/long term.
- If the company doesn't have data, or ability to answer a question please note it. As in, "there are no available data to respond to this question", or "we only know part of the answer to this question – etc."
- Answers can be short and provide an overall picture of the most important sustainability aspects. Somewhat longer and more specific answer is requested under template II of the three-steps in the production cycle.

Template I

As product development takes into account the types of products the company wants to provide and what markets should be in focus, predictions of consumer's futures desires and the company's capabilities of meeting these are critical for success.

We argue that sustainability aspects are of increasing commercial significance on the global market. The market analysis should therefore thoroughly deal with the global sustainability challenge. The focus should be on the true service/utility that the product should provide (basic functions), and clarify what basic human needs that the company wants to fulfill with their products.

We believe that a thorough clarification of needs, desires and functions in combination with a full sustainability perspective can stimulate creative solutions and sometimes completely new product/business ideas.

Template II

In current product design there is a "Conceptual Design" phase which looks at how the product will ultimately be created. Incorporating sustainability aspects into the concept design phase can prevent negative impacts on ecological and social systems throughout the life-cycle of the product, and

to assure functions that contribute to a sustainable development of society at large.

Template III

In parallel with the market analysis and the conceptual design, an overall marketing plan (and rough ideas of a production plan) is normally developed.

Companies can influence customers' and other stakeholders' preferences, as well as market conditions through legislation, taxes, subsidies, and other politically decided incentives. This consideration at early parts of the development process can have big impact in the future success of the product on the market. It is worth not underestimating the possibility of the company, likely in strategic alliances with other companies, to influence societal policy changes through communication. Judging probabilities and the timing of such market changes is important in deciding what product concepts to prioritize.

Furthermore, since it is rarely possible for a single company to fully control the full life-cycle of its products, dialogues, and business agreements with other companies and stakeholders should be considered strongly already within current market conditions.

Reference: Ny, Henrik. 2006. *Strategic life-cycle modeling for sustainable product development*. Blekinge institute of technology licentiate dissertation series, 2006:08. Karlskrona: Blekinge Institute of Technology.

The sustainability principles are those principles that an organization abide by when its operations are socially and ecologically sustainable. The sustainability principles are the same for all organizations and are at the base of the work for strategic sustainable development.

The four sustainability principles	Explanation:
<p>1. When our operations are sustainable we have stopped contributing to systematic increases in concentrations of substances being extracted from the Earth's crust.</p>	<p>We extract from the earth's crust only as much as can be returned back via the natural cycles. Examples of problems in nature there are increases of heavy metals in the soil, phosphates in the lakes, sulphuric acid in the forests and carbon dioxide in the atmosphere. Nature does not endure a systematic increase of any substance. Every atom of, for example, mercury, lead, cadmium, zink, copper and carbon that we take from the earth's crust must go somewhere. The challenge is to find solutions where we can substitute those metals and minerals that are uncommon in nature for those that are more common, reduce our dependence on fossil fuels, and use substances from the earth's crust more efficiently. The more abundant the metal is in nature, the more freely can we use and recycle it without contributing to increases of concentrations. Aluminium and iron are for instance considerably more abundant than copper and cadmium. Other solutions imply that we choose renewable materials and fuels as for example wood, fiber materials, ceramics, glass, biofuels.</p>

<p>2. When our operations are sustainable we have stopped contributing systematic increases in concentrations of substances produced by society.</p>	<p>From our own production we only emit as much as can be returned back via the natural cycles.</p> <p>Examples of problems in nature there are increasing contents of substances that are hard to degrade and are foreign to nature such as PCB, many biocides, solvents, dioxins, and bromated fire retardants. Many additives in plastics like chlorinated paraffins and substances that are harmful to the ozone layer also exist. These are some examples that already create problems. The production is either intentional, as for example in chemical industries, or unintentional, for example emissions from combustion. Substances, that do not degrade quickly into the natural cycles are, “left over” and increase in concentration in nature. This applies also to naturally occurring substances which are scattered in larger amounts than the natural cycles can handle, like nitrogen compounds. The challenge is to find solutions where we can substitute those substances, produced by society, that are uncommon in nature for more common, or are quickly degradable ones, and to use all substances produced by society more efficiently. We need also to find solutions where we can phase out substances that are uncommon in nature, yet due to very high usage or large emissions, increase in concentration in nature. We can – in a sustainable society – temporarily use some substances which are hard to degrade and are foreign to nature. One example can be important medicines. But this is only valid when there is the alternative substances are inadequate; and after use they should be recycled in well controlled environments.</p>
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<p>3. When our operations are sustainable we have stopped contributing to nature's systematic physical degradation.</p>	<p>We will leave enough of the earth's surface to keep the natural cycles running. Examples of problems in nature are deforestation, desertification, and impoverishment of nutrients in top soil, the construction of roads and buildings on fertile agricultural land, over-fishing of seas and lakes, disturbing tourism in sensitive <i>nature areas</i>, uncontrolled diffusion of genetically modified organisms (GMO) and disruption of ground water flows. The challenge is to find solutions where we only use resources from well managed ecosystems, use both resources and natural surfaces more efficiently, and take precautions regarding all forms of manipulation of nature. This means that we choose sustainably produced forest and agricultural products, build only on already exploited land, use more efficient logistical solutions, change to less space demanding transportation and restore land after strip mining.</p>
<p>4. When our operations are sustainable we have stopped systematically undermining humans' ability to meet their needs*.</p>	<p>We do not hinder people from meeting their needs. Examples of problems in society are famine, war, health hazardous working conditions, materials and products. Many people in the industrialized world suffer from an increased workload and a constant time pressure that contribute to an increasing psychological unhealthiness due to a social and work related stress. Generally, also the business related consequences to this are insufficiently attended. The challenge is to find solutions where our products, working methods and materials are safe and not health hazardous. We need also to find solutions where we can create conditions for comfort and personal development, offer livable wages and benefits, and empower employee's search fo identity, refrain from using involuntary and underpaid workforce and child labour; not constrain nor intrude on the employees' legal rights and ensure that the local community provides for health care and schools.</p>

Source: Oldmark, Jonas et al. 2004. *Verksamhetsledning för hållbara affärer*:112: Det Naturliga Steget, The Natural Step. 2004. Management system for sustainable business. Stockholm.

* Market desires are not the same as human needs. Human needs have been described as the most basic needs which all humans share. Maslow's hierarchy for human needs is illustrated by the well known pyramid of needs. For our purpose we refer to later research, done by Chilean national economist Manfred Max-Neef, where the human needs are defined as nine and between which there is no hierarchy. This research means the basic human needs have been the same for all cultures and in all times. However, it is time, culture and place that decide how humans choose to satisfy these needs.

The nine human needs are:

Subsistence

Protection

Affection

Understanding

Identity

Creation

Participation

Leisure

Freedom

Source: Max-Neef, Manfred et al. 1990. *Human scale development: An option for the future*. Santiago Uppsala: Development Alternatives Centre Centro de Alternativas de Desarrollo (CEPAUR)

Appendix E: Sustainability learning curves for entrepreneurs

Pre-survey

March 2007

Post-survey

April 2007

Pre-survey

Post-survey

Pre-survey

Post-survey

Appendix F : TSPDs, questions for Inova case

I. Market Desires/Needs	II. Concepts	III. Extended Enterprise
<p>Current market desires addressed</p> <p>What current market desires is the product or service intended to meet?</p> <p>What are some current overall sustainability problems related to these market desires?</p> <p>How do these market desires relate to basic human needs?</p>	<p>Current sustainability impact</p> <p>What current flows and management routines are critical from a sustainability perspective?</p> <p>What are the critical violations of the sustainability principles at various stages of the incubator? Where is the incubator in compliance or engaged in restorative action already?</p>	<p>Current cooperation/ communication</p> <p>Does cooperation exist now to promote sustainability integration?</p> <p>Do barriers exist now that prohibit integration of sustainability?</p> <p>Is the organization trying, through external communication or actions, to overcome barriers? How?</p>
<p>Future needs to address</p> <p>How can the services provided by incubators develop to support sustainability?</p> <p>Are there any trends pointing in that direction?</p>	<p>Internal operations in the future</p> <p>Can the above flows and routines be developed to comply with the 4 Sustainability principles, and help society at large to do so?</p> <p>What actions will Inova be taking when it has reached its sustainability vision?</p>	<p>External partnerships in the future</p> <p>How will stakeholders help promote sustainability in the future?</p> <p>What future partnerships could exist to reduce business impact on 4 SPs?</p>

Appendix G: TSPDs, Inova case answers

Template I - B

Market/Societal Needs

What current market desires is the product or service intended to meet?

BITS	Provide education and training for aspiring entrepreneurs. Help to connect and network with investors, potential partners, customers. New ways to solve problems. Regional economic development and growth, jobs.
INOVA	<ul style="list-style-type: none">• Support and training (not education) for start-ups.• The support is divided into the fields: Organization, Networking and Branding.• Help with seed capital.• Customer contacts• Counselling.

What are the current overall sustainability problems related to these market desires?

BITS	Focus on growth to what end? Without clear sustainability principles companies grow toward increasing environmental pollution, outsourcing to locations with poor labour standards, and importing raw materials that are not sustainably managed.
INOVA	<ul style="list-style-type: none">• Lack of competence within the sustainability field.• Inova does not today have the competence that is required to give advice and influence the companies to integrate the

	<p>sustainability thinking in their business.</p> <ul style="list-style-type: none"> • Difficulties in setting the boundaries for the field of sustainability. • How far shall the sustainability thinking be allowed to steer? • Are there “more important” values which should make the sustainability thinking to be put aside? When? • Who decides when this happens? • Success stories. Lack of role models. • Lack of long term perspective • Patched environmental image vs. Embedded sustainable core values
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How do these market desires relate to basic human needs?

BITS	<p>Incubator's help people (business owners and society meet many of their basic human needs. It could be said all of them in some way. The needs being most satisfied by entrepreneurial creation seem to be identity, subsistence, and understanding. (Satisfiers are ways which people meet their needs. ex. Identity is satisfied as entrepreneurs create a business; they control operations and decisions, and become more personally aligned with their company than most people do with their work.)</p> <p>The largest potential violation of human needs may come from the value chains of the companies. The companies can violate the human needs of freedom, participation, and protection through the products/services they create via the materials/energy used, and labour practices they support.</p>
INOVA	<ul style="list-style-type: none"> • Inova influences people through refurbishing among the basic needs. • We give them possibilities to realize their dream, create an identity in their company, give feeling of freedom and purpose to existence. • However at the same time we can inflict on other needs in life such as security (the companies must dare to give all, take a risk) and sustenance (stress).

-
- Opportunity to become unique in a sound way – proud and trusting in themselves.

Template I - C

Future

Market Desires/ Human Needs

How can the service provided by incubators develop to support sustainability?

BITS	<p>Integrate cutting edge sustainability business techniques into business development areas. Build businesses competence in;</p> <ul style="list-style-type: none">• Systems thinking - understanding natural laws and principles of sustainability.• Locally restorative practices that acknowledge a global perspective of business impact.• innovation inspired by understanding living systems – Biomimicry• Effective and efficient material/energy use from the beginning, substitution of un-sustainable alternatives• Reinventing a production economy toward a service economy• When businesses see their larger connection to society - positive and negative- they can develop with the basic needs of human society in mind.
INOVA	<ul style="list-style-type: none">• The company can create a value that singles it out from the many. This can among other things attract competent personell.• We can give growth companies an early insight in sustainable development that affects how they build their business in the future and make decisions.• Use the force – not work against gravity

Are there any trends pointing in that direction?

BITS	Big business CEO's "finding sustainability", research institutes are focusing on service based economy, biomimicry, new technological developments - light materials, totally recyclable, modular design, Universities creating green MBA's. Co's designing workplace perks - ride-sharing, providing local organic food, spa's, gym. Other incubators are working to integrate sustainability
INOVA	<ul style="list-style-type: none">• Awareness/Environmental thinking is fashionable.• Society has woken up to realize that environmental thinking is necessary.• Legislation and policies. Laws and policies show that long term thinking is prioritized.• Venture capitalist attention. Venture capitalists have started to realize that sustainability thinking can generate big business, i.e. capital.

Template II - B

Internal Operations: Current Sustainability Impact

What current flows and management routines are critical from a sustainability perspective?

What are the critical violations of the sustainability principles at various stages of the incubator? Where is the incubator in compliance or engaged in restorative action already?

BITS

An incubator delivers competence development for business owners. The business owners use their knowledge from the incubator to make choices affecting their flows of material and energy in their own processes (SP I-IV).

Incubators are most dependent on employee competence and strategic partnerships (SP IV). The most critical energy and material flows are associated with the transport and logistics required by external communication and events to attract new businesses (SP I, II). In day to day operations the largest flows come from transport of staff, potential, and actual incubated businesses (SP I, III).

Incubators leave behind operational waste; paper from outreach, food scraps, old equipment, and used supplies (SP II, III). Emissions from non-renewable energy and transport left (SP II, IV) Businesses leave operational waste in addition to waste from manufacturing and end user disposal of their products (SP II, III, IV).

Violations: Energy and material coming into the incubator doesn't disappear, it comes out as waste and emissions. These are critical flows in regards to SP's I, III (fossil fuel in electricity and fuel, land degradation in waste to landfills) SP's II, IV (material in like office equipment, supplies increase use of substances foreign to nature. The waste of emissions and electronics affect people's health and safety). Decisions made during start up development influence how

	<p>businesses develop their product or service in the future. Either in compliance or violation (SP's I-IV).</p> <p><i>Compliance:</i> Staff and stakeholders increase entrepreneur's ability to meet their needs of subsistence, identity, and freedom. (SP IV). Some energy sources used are renewable. Energy efficiency measures are used (SP I).</p>
<p>INOVA</p>	<p>Inova takes an idea and creates an added value to this through offering organization, knowledge and branding advice.</p> <p>We are dependent on:</p> <ul style="list-style-type: none"> • Products, material and service • Energy for localities. • Transports and logistics. • Equipment • Staff competence • Idea carriers • Strategic partnerships • Financing <p>We deliver:</p> <ul style="list-style-type: none"> • Competence • Contacts and networking • Service and technical support • Soft loans in early stage, seed capital in early stage, resources that are worth money (consultants etc.) • It is not Inova's task to tell the companies how they shall do to work sustainably. However Inova shall try to infiltrate the sustainability thinking in them so that they themselves choose solutions and ways that lead to them making sustainable decisions. • There will be a challenge for Inova to take in the four sustainability principles in our vision. Should we do that anyway?

Template II – C

Internal operations in the future

Can the flows and routines be developed to comply with the 4 Sustainability principles and help society at large to do so?

BITS	<p>Sustainability is integrated into all processes - it is the new economic paradigm. Incubators are a model of service based organization's that fully engage the community around them to create healthy businesses for future generations to own, work in, and support financially. Staff are master's of their own personal aspirations - the work they do is the most important thing to them personally. They facilitate connections with experts on new business thinking and ARE experts in creating shared mental models, shared visions, team learning, and systems thinking. They are given time to explore personal interests and develop them at work.</p>
INOVA	<ul style="list-style-type: none">• Inova can be a resource for sustainable business development that can guide entrepreneurs, investors, society and others within the issues.• Inova can act as a good example for how sustainability shall be implemented in a business (for example environmental thinking at the workplace like re-cycling).• Increase waste recycling• Offering healthy food to eat and drink to guests and ourselves• Determine where key competence is needed within Inova• KPA sustainability startup fund. A fund where companies that think sustainably can apply for money.• Further develop virtual Inova.• The Inova house could become a passive house to decrease resource spending.• Use RAMP as a forum where we plant the sustainability thinking at companies, the public and at investors. There we have the possibility to lift the issue onto the agenda!• We can plant questions/thoughts at new companies (alternative decision roads and ways of acting).

- Offer training and advice to new companies that want to implement more long term ways of working that create business.

Inova shall work with concrete rules of approach and not get stuck in abstract formulations. We shall integrate the sustainability thinking in the contact with the companies which can for example be done by supporting them in their efforts to find alternative solutions. The ideas shall however not be rejected if the solutions are not reached.

Inova can give good and bad examples of companies that work sustainably. This can inspire and motivate as well as get the companies to realize why they should start reflecting. Examples that show business opportunity.

- Continuous follow up on Inova's own actions
- Yearly self assessment of Inova's support and ideas
- Put requirements on our partners and vendors
- Find Inova's "cornerstones", the pillars in a graphic presentation

What actions will Inova be taking when it has reached its sustainability vision?

BITS	<i>See action items above and expand as concrete short and long term actions to take now in order to reach the agreed upon vision.</i>
INOVA	<ul style="list-style-type: none"> • Asking the right questions about sustainability at the right stage of the process. • Develop the questions for the first stage, and determine the right amount of information to give when introducing sustainability • Introduce sustainability perspective right from the beginning. • Not a 7th criteria • Producing good examples from start up companies that are here

now.

- Inova is an arena/meeting place for sustainability sharing
- Challenge start up's business ideas
- Provide lectures from around the world touching different business aspects
- Sustainability drive seminars
- Adequate checklists exist

Template III - B

External Stakeholders

Current cooperation and communication

Does cooperation exist now to promote sustainability integration?

BITS	Organizational donors are beginning to require sustainability integration. Kommuns and Universities have goals and programs supporting sustainability.
INOVA	Inova has some cooperation with Energikontoret, Region Värmland – can this be a possibility? No actual active support available, but a general view that it has to be done and this is also a type of support.

Do barriers exist now that prohibit integration of sustainability? Is the organization trying, through external communication or actions, to overcome barriers? How?

BITS	<p>Investors and donors often have short term perspectives and want quick results. This and a narrow focus on specific requirements can inhibit integration of long term perspective that is needed when developing towards sustainability. Growth and spin-off companies are not fully utilized to tell their lessons learned. Sharing of experience can facilitate quick learning and implementation for incubator businesses around sustainability in the future.</p> <p>Creating a strong strategic plan will communicate commitment to donors and give investors concrete examples of how Inova start ups are better prepared to compete in a global market. Networking</p>
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	<p>events such as one planned in June will help make connections for organic sharing of lessons learned. A more structured model could grow from this.</p>
INOVA	<p>The major barrier now is the Inova employees lack of knowledge in the sustainability area, but also the fact that it has not been a focus area until now.</p> <p>The Inova process is not yet updated with the sustainability focus.</p>

Template III - C

External partnerships in the future

How will stakeholders help promote sustainability in the future?

BITS	<p>Business stakeholders with money (investors and customers) will insist that businesses comply with natural systems, pulling business more quickly into integration.</p> <p>Customers are able to participate in product development to increase effectiveness of design and re-design (service based feedback – like your computer or copy machine)</p> <p>Creativity of entrepreneurs is passed onto the community and vis-versa. Immigrants with new and culturally diverse ideas are utilized for new business concepts – further integrated into the community.</p>
INOVA	<p>Discounts may become available as a reward for “working for good”</p>

What future partnerships could exist to reduce business impact on 4 SP's?

BITS	<p>Tours of companies that have closed loop recycling and product design. CTF partnership for re-design of product concepts toward service oriented. Provide staff time to explore and learn more about sustainability challenges and solutions. Community members can invest in company development financially, through ideas, product design input. A forward thinking investor can act as a mentor on sustainability development.</p>
INOVA	<ul style="list-style-type: none">• Cooperate/revitalize the Edberg Foundation• Secure cooperation with partners that can offer sustainability competence adequate for different business needs.

- Create a “green investors” forum for qualified sustainable investments
- Green alliances – create organization and company alliances which provide resources to Inova in exchange for 7th criteria experience and values. Maybe strategic alliances with accounting firms, banks, etc.
- Look at current advisory list and all network to find out who has some sustainability competence that can be engaged right now.
- Special investors could start a business fund for sustainable business ideas in the region