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FOCISS for an Effective Sustainable Innovation Strategy

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ABSTRACT

Sustainable development will be a major driving force for new developments in businesses. Most companies are very much aware of that but find it difficult to translate this insight into concrete actions. An often observed obstacle is that most, particularly SME's, find it difficult to evaluate how sustainability can effect their business. They lack a clear view on the relation of innovation and sustainability. Too many aspects and issues might be involved and priorities are not clear either. For really effective sustainable business strategy a company must concentrate on a limited number of key areas and issues which constitute a company's major challenge for sustainability and continuity and are specific for its own character, products, location and ambitions. SME's in particular do need a straightforward, short and simple approach to help them.

The FOCISS (Focussing Innovation Strategy for Sustainability) approach offers that. It involves a stepwise focussing on, subsequently, areas of relevance, major issues in these and ultimately to the most promising (in view of economics and sustainability) innovations. It is the outcome of practice based research in cooperation with industries from different sectors.

It differs from other approaches by setting first the 'agenda' for sustainable business and the relation with the core business. Only after this innovations are selected. It uses as much as possible the own views and information available of the people in the company. Because of that it improves exchange of views and information on such issues through all departments, leading to real commitment, ambitions and an understanding of what sustainability involves.

1. SUSTAINABILITY AND SME'S

Recent management research literature concerning the relation of sustainability, innovation and profitability shows a growing consensus that incorporating sustainability and corporate social responsibility in the company strategy will strengthen the company's basis and profitability, certainly on the longer term (Bhattacharyya 2007). Nevertheless Bhattacharyya concludes: "The notion that CSR should benefit the firm as well is no news now. But a framework which guides managers so that they can decide which CSR initiatives make strategic sense to the firm remains elusive." He observes that this missing practical framework is an obvious 'research gap'. Theory is not translated into practice. He concludes in his study that an effective 'CSR-strategy-filter' should be developed that is able to define those CSR activities which:

1. contribute to value chain activities
2. improve context of competitiveness

Evaluation of often informal surveys done in the various industry sectors also shows that most companies accept that sustainable development is essential, for society and economy and

therefore important for them as well. However most do not have a clear view on how that will affect them. In practice therefore most companies, in particular the smaller, tend to act, as if sustainability is for the larger companies and the politicians. They consider it more a risk rather than an opportunity and insufficiently acknowledge it as the major driver for their future innovation strategy. This discrepancy between understanding and actual behaviour has been the motivation for practice based research to overcome that. It indeed intends to fill the observed 'research gap'. It has led to the FOCISS approach which has been applied for about 20 companies. It can be used effectively as the 'CSR-strategy-filter' Bhattacharyya proposes.

Our studies indicate that major causes for the observed discrepancy are:

- Sustainability appears to be too complex, with too many issues involved, most of them with no clear relation with the actual business and daily operations.
- Companies select innovations that are based only on short term arguments even when these appear to be sustainable. The result can be that the chosen course is not optimal or even completely ineffective for becoming a sustainable business in the long run.
- There is often no clear strategic framework to select really novel innovations, certainly at SME's. Companies know that knowledge is available but have no means to determine which of it is useful or even essential to them. This is one of the principal causes of the innovation paradox. As a result companies stick to their 'trusted' ways and no radical novel innovations, often needed for future sustainable profitability, are considered.
- Insight in the importance of CSR and sustainability stays confined to a small number of people whose efforts then are insufficient effective: the CSR / sustainability strategy is not integrated in the actual company strategy. An effective insight and commitment through the company as a whole must be brought about.

Another factor involved is the multitude of aspects and options that appear when companies are discussing sustainability. There are many checklists with large lists of aspects and issues that have to be considered. Such lists are very useful when evaluating the sustainability of a company as a whole, or when an official report on sustainable performance is required. Certainly for SME's they are too impractical and actually put them off. Companies need focus and priorities, with issues which are related to their actual core business.

- Any company can only give effective attention to a limited number of priorities. If the list becomes larger then 3 or 4, real attention for the whole will dwindle.
- A company has commonly only real influence on issues which are connected with their core business. Example: if water is essential for a company's activities, it must do something about that. If child labour might be involved in intermediary products, a company could influence it through purchasing policy.
- When an issue is taken up which is not really essential for the future and/or profitability of a company, attention for halt during an adverse economic period, so in the end time, money and resources have been used to no avail.
- It will very difficult to keep all actors involved, internal and external, when there is no common feeling that those action and innovations are essential.

To develop an effective sustainable business strategy and at the same time to define really effective innovations requires:

- a. Generating a better understanding of what sustainable development and sustainable business really comprises and the actual role a company has and which influence sustainability aspects have on it.

- b. Translating the long term developments associated with sustainability into factors influencing the company on the short and the longer term. Choices made now must be profitable now but also form the basis for future strength.
- c. Offering a practical framework to decide what issues, developments and innovation paths are useful and even essential, based on a good opportunities and risks inventory and assessment.
- d. Involving the company staff as a whole during the inventory and selection of options. It creates broader insight and more effective commitment through the whole of the company.

2 CREATING UNDERSTANDING, FOCUS AND COMMITMENT

The FOCISS approach has been designed to handle the above given factors and requirements in a concise and practical manner. SME's in particular are not waiting for long, complicated and extensive (expensive) studies. The requirements are therefore:

- 1. Practical and effective in particular for SME's. It should be simple and straightforward and lead to a small (and thus workable) set of priorities for obvious and effective actions
- 2. Relatively fast and not very time consuming.
- 3. As much as possible using the own views and information of the company. External stakeholders, such as customers and NGO's could be involved, but it must still be 'the company's own choices and views'.
- 4. Leading to real and company specific issues and not just the 'fashionable' or those that are now debated broadly.

Further considerations are:

Commitment before 'completeness'

Experience shows that studies and advice prepared by an external party does not easily create effective commitment in an SME, notwithstanding how well informed and scientifically based it is. Such reports are too often 'only gathering dust' because people do not feel involved. Furthermore most companies, even the smaller ones, possess a lot more knowledge and insight in the relevant issues, backgrounds and available options than often recognized. It has just not been made accessible before.

In our view creating commitment is, in practice, more needed when starting with a sustainable business strategy than 'scientific analysis and completeness'. So the method does not necessarily aim for 100% coverage of all issues and all possible profitable innovations. It should however generate sufficient support in the company. Means to that aim are:

- 1. Involvement of all key personnel in a company, including the director;
- 2. Use of the knowledge available within the company itself;
- 3. Improving 'transversal' communication by the workshops;
- 4. Aiming at innovations based on own choices and decisions.

Sustainability before innovation

Sustainability requires innovation and innovation that does not take the (near) future constraints set by sustainable development into account will not pay off in the end. Common practise, however, is to select first an 'interesting' innovation based on (commonly short term) financial and market factors. Sustainability is only brought in as the second step, intending to make the already selected innovation as sustainable as possible. It should, however, be the other way around. An innovation that appears to be sustainable in itself, doesn't necessarily fit in a sustainable business strategy leading to a sustainable and viable future for the company.

As example:

Some companies invest heavily in renewable energy and new innovative low energy processes because that is seen as the present most urgent priority to become a sustainable business. However when the company does not produce products which contribute sufficiently to what a sustainable economy as a whole needs addressing issues such as uncertainty of resources (copper, wood), socio-economic problems with resources (biofuels, child labour) or unpleasant effects of their products (obesity, problematic wastes) they might have set the wrong priorities to stay viable on the long run.

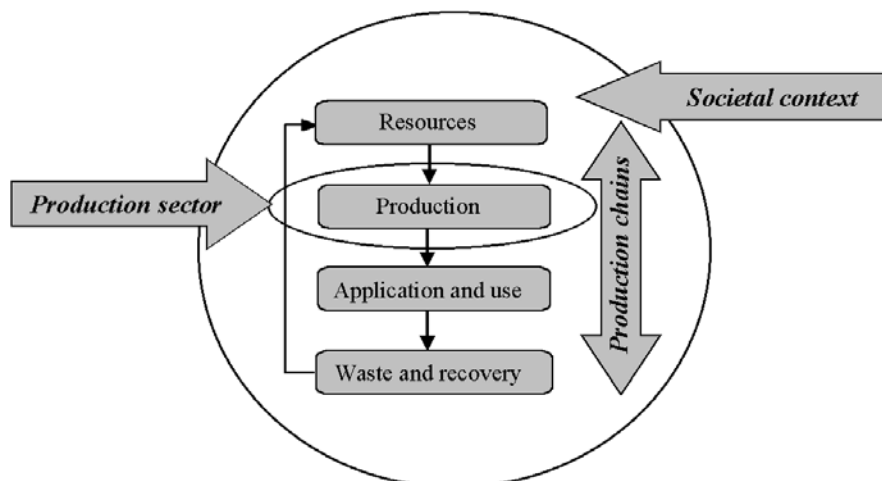
Furthermore an innovation selected to address a key sustainability issue, is not automatically sustainable either. Sustainable housing could imply more transport or social problems. A renewable resource might create social and ecological problems in the areas it is harvested as is the situation presently with the development of 'first generation' bio-based fuels using vegetable oils and maize. A strong prerequisite for any approach which attempts to find sustainable solutions is therefore testing on the risk of such biases and rebound effects.

The system character of sustainability

Because sustainable development is unthinkable without radical changes in the complex socio-economic structures that form our economy, a company must understand its own place, role and interests in it (Geels 2002). Understanding the system character of society, sustainability and the effect of such radical changes (transitions) is therefore crucial. It is a subject of much debate, whether such transitions will happen spontaneously, due to economic drivers and market influences, or whether laws and regulations will be the major driver, but they will occur. So companies will have to respond and adapt in the right direction to survive under these changing economic and societal conditions.

Therefore companies must also be aware of the system level on which transitions take place and on which their response is the most effective. Three levels can be distinguished: the production sector itself, the production chain and society as a whole as shown in figure 1. (Venselaar, Weterings 2005).

Figure 1: Three levels of systems and transitions



On production level it concerns the own production processes which must be as clean and eco-efficient as possible. Relations with the own employees and the neighbourhood are handled on this level. On production chain level a company is a link in the material chain, from basic resource till waste/new resource and must be made as lean and eco-efficient as

possible. The chain must be closed by minimising losses and optimising reuse. On the societal level a company faces the challenge to respond to the changing needs and requirements that result from the 'sustainable transitions' that take place in the systems and chains a company is part of. Besides risks it offers new business opportunities.

All too often companies address with 'sustainable business' only the production level. There the 'Planet' aspects (environment, resources, ecology) and employee related aspects (labour conditions) are emphasized. One reason is that many companies do have an environmental management system and use that as base for sustainable business management. It is the work area of the HSE department which is quite aware of the need for sustainability. The two other levels are the area of the research and marketing departments. These are commonly less informed about sustainability. A better communication through the company as a whole is needed to come to a real sustainable business strategy.

3 THE FOCISS APPROACH

Starting points and requirements

The FOCISS (Focussing on Innovation for a Sustainable Strategy) approach has been developed to handle the above given requirements and constraints in such way that it can be done fast and simple. For that purpose the approach is developed through practice based research in direct cooperation with companies. It is the best assurance the most practical and effective approach, also for the companies involved, will emerge. The various 'tools' needed are based on existing models and approaches, but are adapted on base of the experience and the comments of the companies. Development is a still ongoing process.

Basic principles are:

1. It treats sustainability in its broadest form: People, Planet, Prosperity (Profit) and therefore also the aspects and issues that are sometimes treated separately as 'Corporate Social Responsibility' and 'Corporate Governance'. They all contain relevant issues and therefore might prove essential for a company in terms of risks or opportunities.
2. It covers the total production chain for a specific product/activity and the larger 'systems' the company is part of. Issues, risks and changes in any stage before or after the own activities will inevitably influence the company's products and activities. All too often these tend to be neglected because a company assumes they can not influence it.
3. It must result in a limited and therefore practical number of issues to be addressed.
4. The relation to the core business and activities of the company must be clear. Only then it is recognised to be essential and create ongoing commitment.
5. A platform for internal communication about sustainability, views and options must form. Selecting the key issues and innovations is only a first step to change course.

The principle elements of the approach are:

- a. A stepwise 'fast zooming in protocol' initially aimed at the key areas of sustainability, which are relevant for the company, secondly at the major issues within these areas and thirdly at the most promising innovations (in view of economics and sustainability). The 'zooming in' is structured in such a way that it leads to a significant reduction in effort and time a company and the advisors involved have to spend.
- b. Tools for discussion, reflection and selection, designed and adapted for this purpose.

The main instrument is the 'FOCISS matrix' to define the areas that must be discussed. A rating procedure is used during interviews and during the workshops to stimulate forming of opinions concerning the importance of sectors and issues involved and the priority they

should be given. The workshops are set-up in such a way that they create effective exchange of information and views and focus on the most relevant points of discussion.

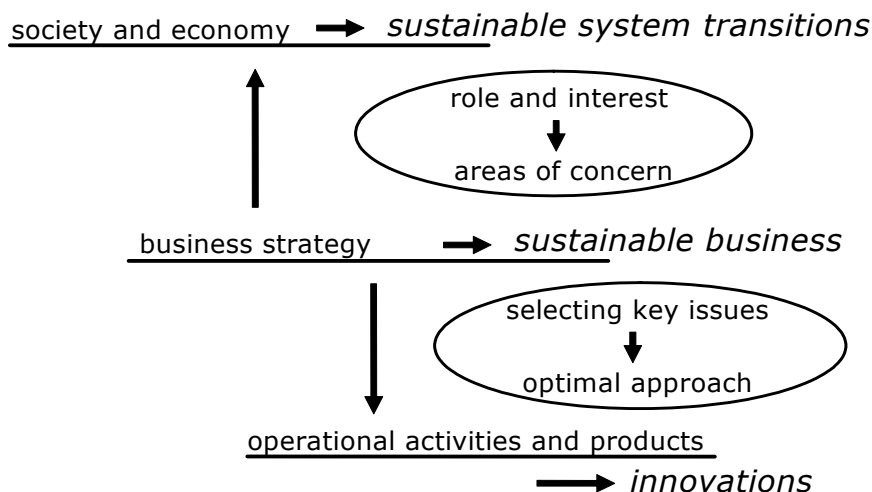
Development

The approach has been developed in cooperation with companies from quite different sectors of industry: electronics, chemistry, food, construction of printing equipment, building etc. The method is made such that only small adaptations are necessary to make it fit for use in different types of businesses. The basic set-up has been improved based on progressive experience, but not in sector specific way. Further improvements might be necessary for specific tools and methods used in the approach e.g. the rating method' (see hereafter). That still proves to be arduous in practice and certainly needs further research.

Zooming in

To come to a practical set of real priorities, it is necessary to zoom in on key issues that are specific for a particular company in view of its character, products, location, ambitions etc. 'Key' implies that they comprise a major risk for business, in any way, when not dealt with in time and in a proper manner. The principle is shown in figure 2.

Figure 2 Stepwise zooming in of the FOCISS approach



Initially is zoomed in on actual role and interest of a company in specific socio-economic systems. That is determined by the manner sustainable development might affect these, e.g. through system transitions that will occur as a result of that. Secondly is zoomed in on areas within the relevant transitions that are the most essential for a company's continuity in terms of opportunities and risks. Thirdly, within these areas the key issues are determined. Finally, for those issues the best approaches / innovations are chosen.

The FOCISS protocol

The stepwise zooming protocol is described in Table 1. Strict adherence to that protocol has indeed proved to be necessary to reveal the advantages and characteristic results, as stated above.

Table 1 Main outline of the FOCISS protocol

1	preparations	introduction in company
		defining scope and selecting participants
		collecting background information
2	place of the company and generic issues	the systems on different levels and production chains involved and the major developments in those
		specific issues in the industry sector, on that location
3	key areas of attention	interviews
		workshop
4	key issues	inventory and elaboration of issues named for the selected key areas of attention
		workshop
5	sustainable innovations	inventory of options
		rough estimates of costs and (future) profits and 'sustainability effect'
		workshop

The instructions and details in the protocol are such that, when adhered to, the result is:

- high relevance against little time spend;
- strong involvement of own staff leading to strong commitment;
- a small number of really crucial priorities but high profile in company.

The people involved are strongly incited to give their personal views and to come up with all issues they know. They often know more then they are used to communicate within the company. It might be the information which will prove crucial.

Required preparatory steps

A thorough introduction is necessary to inform all people in the company and involve them, in particular those who are directly participating through the interviews and workshops. It must clear the ground for an open discussion on what sustainable development really is and what it implies for a business. Misunderstandings, wrong assumptions and clearly biased views have to be overcome.

Selection of participants for interviews and workshops should be done in such a way that for all relevant situations and issues someone with expertise is involved. External parties as suppliers, customers and NGO's might participate. Up till now that has been done in only one case (see also remarks under 'benchmarking').

The scope of the study must be defined. Subject of the study must be a well delineated set of processes, products or activities which together are sufficiently coherent and comparable, from resources used till final use. In the various stages of the different production chains the differences in actions and situations must be small. When not consistent, selection of issues and innovations is almost impossible. Such quite different processes and products have to be treated separately.

It is found useful to make an inventory of relevant trends that occur in the particular industry sector concerning sustainable development, the so-called 'sustainability mirror'. For instance the larger issue of climate change is translated in more practical issues as levies on CO₂ emission and emission trade, restrictions on energy use in general, options for renewable resources as well as new markets for substances and materials used for other forms of power generation and low weight materials for reduction of energy consumption.

The FOCISS matrix

A matrix was developed to create a clear overview of all aspects that have to be reviewed, over the whole production chain and for 'People, Planet, Prosperity': the FOCISS matrix. The matrix is used to stimulate people to express their views and use their imagination. Working systematically along all the fields the risk to overlook any relevant aspects or issue is reduced.¹ It has been based on a matrix developed specifically for environmental issues but used in various other methods too (Leopold 1971). On the horizontal axis all the stages of the total production chain are listed. Since these can differ from company to company, they have to be adapted for each individual case. On the vertical axis the various sustainability aspects (People, Planet, Profit categories) are clustered into about 12 groups. It results in 80 till 100 matrix fields to be inventoried.

Figure 3 Basic outline of the FOCISS matrix, used for the interviews

criteria: - can it affect the business - short or long term - strategic and economic effect - effect on sustainability	resource extraction	intermediate products	transport and storage	production Steps	storage and transport	product use and maintenance	discarding, recycling
sustainability aspects	production chain and product life cycle						
Planet environment, resources, ecology							
People socio-cultural, personnel							
Prosperity (Profit) value for company, society and other stakeholders							

Interviews and follow up

Commonly four to five key persons are interviewed using the matrix. These give the information and views on all possible aspects and issues that might be of interest for a specific field, as defined in the matrix. They rate the fields, based on how crucial they think the issues in that field might be for the company. The number of interviewees might differ, dependent on the size of the company. We found that a larger number of interviewees did not result in many more issues or more precise ratings. Issues involve risks and constraints, with respect to continuity, sustainability and profitability, but also business opportunities and new options for better performance. The information is gathered and discussed in a workshop with the staff and other parties involved. Based on this inventory, 3 or 4 key sectors (= fields) are chosen.

In the second stage the issues from those key sectors are described and inventoried in more detail. In a second workshop subsequently 3 or 4 key issues are selected from that.

In the third stage the possible innovative approaches to handle those key issues (risk or opportunity!) are being inventoried and described. A first evaluation of their economic effect and their real effect on the sustainability of the business is made. On the basis of that outcome, a choice is made for the most useful innovations in a third and final workshop.

¹ E.g. the HAZOP method for process safety issues operates in the same manner. (Lawley 1974)

Rating method

To facilitate priority setting the persons involved are asked to give a rating for importance on the aspects and issues in the various steps. That has to be done directly after the interviews and during the workshops. Such rating is rather subjective, based on own information, views and expertise. Combining the results however creates a sort of 'balanced subjectivity'. The results of do not automatically set the priorities, but form the basis for further discussion.

Several rating methods have been tried, from simple to rather complicated. Forced rating proved to be the most practical. Because the use of the matrix in the interviews leads to 100 till 120 fields it is also decided to give a rating for each row of fields separately. A bias that occurs of course is that a rating '5' in one row (eg for the aspect 'resource use') is not the same as a rating '5' in another row (eg for the aspect 'social benefits'). However final priorities are not based on those ratings. The rating results only form the start of the discussion in the workshops.

The results of the interviews are taken together and reported in the form of median values and difference between highest and lowest rating given.² The fields with high median values and those with a large scattering including high values will have to be discussed in the workshop. In practice there is usually directly a series in 10 till 20 fields clearly outlined. The lower scoring fields are not discussed further, although never without checking with all the participants involved.

Workshops

In the workshops all persons that are interviewed participate and preferably other staff which is likely to have views and additional information on the issues that have emerged from the first rating process. Involvement of the staff in the decision making process is most likely improving their commitment in the following implementation process.

During the workshops the selected fields, issues and (later on) innovations are discussed in a structured way. Again a two stage rating process is applied, based on 'forced rating'. The first rating is done before any discussion has taken place, and a second one at the end. In between the motivation for the individual ratings are discussed. In this manner much information and views are exchanged. The last rating determines the final selection of respectively the key areas, the key issues and most sensible innovations.

The system approach as vital element in the method

As discussed before, attention for the system approach is crucial for attaining an effective sustainable management strategy in a company. That is achieved because the initial focus is on sustainability prior to innovation. In the interviews, the workshop discussions and in the 'sustainability mirror' sustainable transitions that could or will occur within the socio-economic system as a whole in which the company operates are brought up.

A somewhat unexpected result of the better attention for the system as a whole is that innovations which result from this sometimes do not have that 'clear sustainable look'

As example:

It is quite likely that a transition will have to occur in the transport systems as we know them. Changes are needed concerning energy consumption, but also concerning noise, safety etc. New, cleaner fuels and lighter vehicles have a clear 'sustainable ring to it' but are insufficient to solve the entire problem. Reduction of the need for transport can be done by organizing production in a different manner. At first face such an action does not look 'typical sustainable'.

² The median value means that the number of ratings given with a higher value is the same as given with a lower value. For our approach this is a more relevant value then just the 'arithmetic average'.

Creating effective commitment

As said before the FOCISS approach also explicitly aims for creating the much needed commitment in the company. The procedure and in particular the workshops are instrumental in that because the main staff members are involved in the selection and decision making. Sharing information is an added factor. Information, problems, unknown aspects, but also possibilities and wild ideas cross the boundaries that often exist in an organisation during workshops. Sometimes perfect solutions were found that could not have come up without this mode of communication. Some additional research might be needed for specific items and in particular to draw the 'broader picture' but the main body of information, views and conclusions is felt to be 'own'.

Benchmarking

It is of course useful to see how right and complete the results of this approach are. The following questions should be answered:

- o are the selected key areas, key issues and innovations, indeed the essential ones;
- o are essential areas, issues and/or innovations overlooked.

A comparison with other methods and their results would have to be done therefore. It proved difficult to do that. To our knowledge really comparable approaches do not exist, certainly where it concerns the other aims such as creating commitment and amount of effort and time involved.

A sort of benchmarking was attained by inviting companies which are known to have been involved already in other projects concerning sustainable management (of which there are many in the Netherlands) to join in the pilot projects. That showed that the same key areas and issues were found, but even then a few new ones came up. They confirmed that in this way, a broader view was generated than just the obvious issues. Besides they felt that existing priority setting was strengthened.

Another concern could be if all relevant information is indeed available within a company. Up till now only in one study customers and suppliers were invited to participate because they were crucial in the design and construction of the product. Companies appear to be rather insecure about discussing such issues with 'the outside world'. However some comparison could be made with information available in reports from NGO's and governmental bodies. They gave, more generic of course, the same issues for the particular industry sectors as came up in the studies. Therefore we feel rather strengthened in our view that people in companies have, all together, a rather complete overview on the issues and problems that exist in relation with their activities. It is just not information people easily volunteer nor discuss in 'normal' business meetings. This approach, in particular the workshops, created an opening for that.

5. SOME RESULTS IN THE CHEMICAL AND FOOD PROCESSING INDUSTRY

A particular branch in which the approach has been used is the processing industry. Presently that comprises of 8 chemical and food processing companies, SME's of various size as well as independently operating units of large international companies, producing a wide range of products, such as specialty chemicals, special polymers, modified natural products, fruit juices and bakery products. As such they form a first basis to draw some general conclusions about the type of results.

Typically 3 or 4 key areas were defined, and evaluated to find the key issues and possible innovations. Of course some of those were obvious. However about one third of the areas that came up did not yet get much or even any attention at all before the study.

A differentiation can be made in:

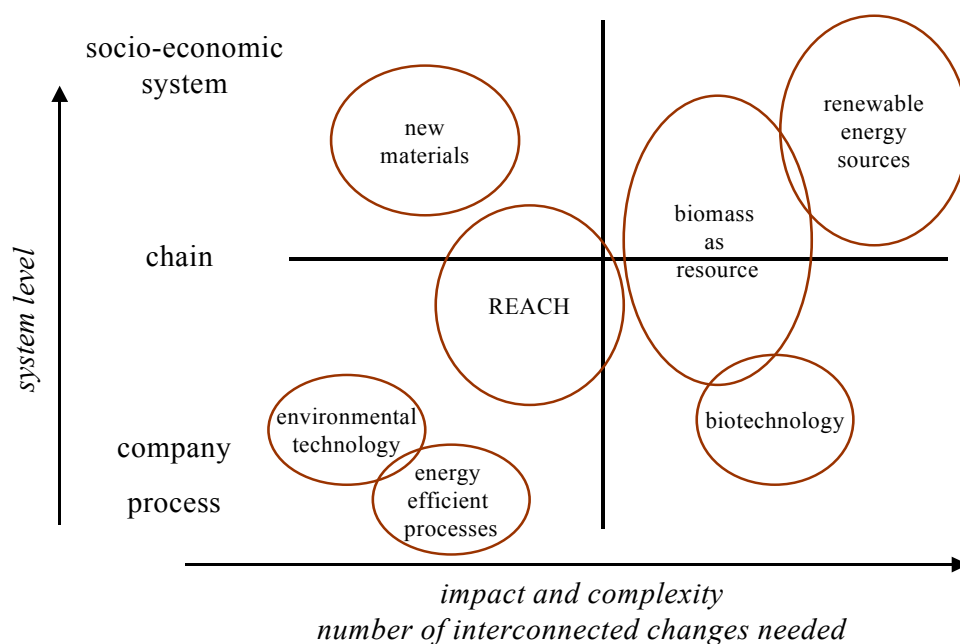
- o 'Expected areas'. These are often the ones which are already being dealt with in a company. So they scored highly in the interviews. These commonly concerned the own production processes and concerned better efficiency, less energy, reduction of waste. In the end however, these were certainly not always selected as the real top priorities for the future.
- o 'To some extent unexpected'. In every company one or more areas, which up till then were not seen as crucial, received a high score. Typically socio-economic developments in the region or 'elsewhere' are a factor in this group of areas. An example is the availability of materials and intermediates which are imported from political unstable areas or which are based on 'unethical production practices'. These were considered less relevant before, because they were seen as not (easily) influenced by the company.
- o 'Totally unexpected': in some cases totally new key areas of attention emerged that had been overlooked before. One example was packaging, which most people in the company had seen as someone else's problem. But also complex changes in the use of products due to changes in agricultural practice came up, which, besides being a risk, even offered quite new opportunities for business.

Particularly the issues and innovations for these 'unexpected key areas' will need more time and even cause frictions. Research and investment programs will have to change focus.

The impact and the complexity of innovations is determined by the system level they act on. At a higher level more changes are needed and/or more changes will occur in other parts of the chain and the economic systems in which the specific company operates. To assess that, a simple diagram was made which characterises the issues and innovations for a certain industry sector.

Figure 4 gives the areas for possible innovation which emerged for the chemical sector. It is obvious that most innovations which companies preferred, tend to be positioned in the lower left part of the diagram. It is also observed that the better options for sustainability and viability are found more up and to the right side. Especially smaller companies however see (probably justly) too many obstacles to go there, one essential aspect of the innovation paradox which is often mentioned in the case of SME's (Venselaar, Weterings 2005).

Figure 4 impact and complexity of issues and innovations in chemistry



The innovations selected

Not in all studies the last step in selecting the best innovations was taken. Some companies found the key issues sufficient for a strategy and sometimes because they were planning new investments anyway in which the issues could be taken up 'automatically'. Sometimes the complexity of the key issues defined was such that more study was necessary. And sometimes the solution was totally obvious and very complicated to implement.

In discussing innovations within the company one must distinguish between three types of innovations, regarding the level of impact on one or more sectors and issues. To some extent that parallels the impact the company has with the innovation on the three levels of transitions as described above.

1. Changes concerning one specific issue in a key sector have no large impact on other issues or sectors and have an effect on the production level of transitions. (for instance a better separation, a new process, environmental measures)
2. Changes in several stages, in the chain, occur and are needed, and lead to changes in the way the chain operates, and to 'integrated innovation'. Examples are:
 - Choosing a new resource which leads to new processes and somewhat different products;
 - Attention for socio-economic factors when buying cheap materials, which are produced under disputable conditions and could lead to adverse reactions with NGO's and in due course with customers.
3. 'Revolutionary changes' in the way the company operates, in its products and/or in the way it helps society 'to take care of its needs'. For instance changing from an oil producer to the production of solar cells.

Most innovations that were proposed fall clearly in the first category. These are the easiest to think off, are often already available and relatively easy to implement.

The second category contains often ideas that live already within the company but are difficult and therefore low on the priority list. Those are not easily selected nor developed further and implemented. Commonly the obstacles and risks are considered to be too many, certainly when it concerns really new technologies or ways of operating. Some innovations that can be considered as examples for this category are clearly selected because external pressure leaves no choice, for instance the reduction of transport of dangerous materials.

The last category of innovations is of course the most difficult to implement. It commonly will not ask for immediate drastic changes but any changes and innovations made now will have to fit in a direction that such 'third level innovation' will necessary go.

6 CONCLUSIONS AND REMARKS

The companies involved agreed that the approach leads to a selection of essential sustainability issues and innovation courses over a broader range of areas than they had considered before. Besides, they acknowledged that it resulted in actions that they indeed 'recognize' as vital to its core business. It was also obvious that developing a sustainable business strategy was less complex then appeared at first sight.

This has a message for research and knowledge institutes as well. The question is if research time and efforts are actually spend sufficiently on what companies really need and society requires from those companies. All too often new knowledge and technology is pushed as 'being sustainable on its own'. As is mentioned, focus should be on innovations that contribute to the essential sustainability of companies, not on innovations that 'are' sustainable as such. Furthermore, a better insight and better focus of research in this respect could solve the innovation paradox to some extent (Venselaar, Weterings 2005).

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