



**Nordic Project on Development and
Implementation of
Environmental Performance Indicators
in Industry**

**Environmental performance indicators
for local communication**

**Case report from Peterson Linerboard
December 2000**

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REPORT OVERVIEW

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Resymè: Peterson Linerboard participated in the NORDEPE-project as one of 11 case companies from Sweden, Finland and Norway. The main goal of the project was to improve the environmental performance at Peterson Linerboard. This was to be achieved by: <ul style="list-style-type: none"> • Improvement of the environmental performance indicators • Improve the communication processes towards external stakeholders • Give input to the NORDEPE-project concerning results from this process <p>To obtain these goals the project activities were concentrated on initiation a dialogue with stakeholders in the local community.</p> <p>The stakeholder assessment were aimed to enable</p> <ul style="list-style-type: none"> • the definition of future environmental challenges in a short and long term basis. • knowledge on how to present environmental reporting and communication is perceived by the stakeholders. • gathering of experience with extended stakeholder communication <p>On the basis of the results of the stakeholder assessment, some immediate actions were taken to improve operational performance.</p> <p>Additional operational indicators related to local environmental aspects were developed, and will be implemented. Communication procedures aimed at improving communication with and information to the local community were improved and implemented in the management system.</p>		
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0. Summary

Peterson Linerboard participated in the NORDEPE-project as one of 11 case companies from Sweden, Finland and Norway.

The main goal of the project was to improve the environmental performance at Peterson Linerboard.

This was to be achieved by:

- Improvement of the environmental performance indicators
- Improve the communication processes towards external stakeholders
- Give input to the NORDEPE-project concerning results from this process

To obtain these goals the project activities were concentrated on initiation a dialogue with stakeholders in the local community.

The stakeholder assessment were aimed to enable

- the definition of future environmental challenges in a short and long term basis.
- knowledge on how to present environmental reporting and communication is perceived by the stakeholders.
- gathering of experience with extended stakeholder communication

Additional environmental performance indicators were then to be constructed according to findings from the stakeholder assessment, and implemented in the environmental steering system and as a basis for the EMAS reporting for 1999.

The stakeholder assessment was based on three different approaches – interviews with representatives for stakeholder groups, focus groups with representatives from one stakeholder group, and questionnaires to larger parts of the local community.

The respondents of the questionnaires should agree or disagree of a set of statements concerning environmental issues in general, and local issues in particular (traffic, noise, water pollution, odours). One open question was included, in order to give the opportunity to address issues not covered by the questionnaire.

In-depth interviews were carried out with leading community officers. The questions were sent in advance, and focused on the same themes as in the questionnaires – environmental aspects in general and local aspects in particular. The interviews focused also on aspects around communication and information to both community officers and the population.

The focus group consisted of representatives from neighbourhood organisations (velforeninger). The issues were the same as from the questionnaires, but no alternative answers were given. The group should also prioritise among the environmental aspects in focus, and give advice on future communication processes.

The stakeholder assessment gave some clear answers on stakeholder priorities, and input to improvement of the environmental performance and communication procedures.

On the basis of this, some immediate actions were taken to improve operational performance. Additional operational indicators related to local environmental aspects were developed, and will be implemented. Communication procedures aimed at improving communication with

and information to the local community were improved and implemented in the management system.

The following indicators were chosen:

Transport and traffic to/from mill:

- Amount of products transported out by ship/Total amount of products.
- Speed limits in neighbourhood

Noise level from mill

- Neighbourhood opinions shall be mapped by regular meeting with the neighbourhood organisations and local community officers.

Odour

- Number of complaints.
- Neighbourhood opinions shall be mapped by regular meeting with the neighbourhood organisations and local community officers.

Water quality

- Water quality in the recipient monitored by regular (annual) measurements of oxygen and turbidity.

1. Introduction

In 1996/97, the first preliminary methods for Environmental Performance Evaluations and Indicators (EPE/EPI) in business organization were developed by Norwegian and Swedish companies. This test phase identified areas for additional work, and gave input to the development of draft ISO standards for EPE and EPI (ISO 14031), EGT 1997.

Based on the preliminary experiences from this first phase of the EPI development, the Nordic Project for Development and Implementation of Environmental Performance Indicators in Industry (NORDEPE) was made.

The NORDEPE project was initiated in 1998 and finalised in December 2000.

The main aim of the NORDEPE-project was to develop and implement environmental performance indicators as an integrated part of environmental management systems, decision making processes and communication processes in the participating companies, and in the long term to increase eco-effectiveness and competitiveness of Nordic industry.

In the NORDEPE project, the following main activities were carried out:

- I. Evaluating and testing quality and statistical properties of emission data with regard to environmental performance evaluation, e.g. benchmarking and rating of companies
- II. Development and testing of indicators used for improvement of the environmental management and operational practices (BOP/BAT) in SME companies (Supply Chain Management Indicators)
- III. Development and testing of indicators for strategic decision making, strategic development and vertical communication in large corporations, e.g. product portfolio development, technology innovations and sustainable development policies
- IV. Development and testing of performance indicators for external communication, with special emphasis on the needs of financial stakeholders (Indicators for Reporting and Green Rating).

Peterson Linerboard participated as a case company in the NORDEPE-project, with a special emphasize of the activity IV – development and testing of environmental performance indicators for external reporting. Special emphasis was put on the testing and developing the methodological framework for stakeholder assessment analysis.

This report is giving the results and experience from this project.

Ole Jørgen Hanssen from Østfold Research Foundation has served as project leader for the NORDEPE-project and reported to a steering group with the following members:

- Bjørn Sveen (Confederation for Norwegian Business and Industry),
- Inger Strömdal (Swedish Confederation of Industry)
- Helena Manninen (TEKES)
- Per Arne Syrrist (Peterson Linerboard)
- Lars Göran Bergqvist (AstraZeneca)

Chalmers Industriteknik (CIT), Technical Research Centre of Finland (VTT), Centre for Product Oriented Environmental studies (CPM) at Chalmers and Østfold Research

Foundation (STØ) served as advisors and facilitators for their respective national companies participating in the project.

A list of all participants from companies and institutes in this project as well as the list of reports from this project is given in annex 1. The reports can be ordered from the participating institutions.

2. Introduction to Peterson Linerboard

The Peterson Group is a leading fibre-based Norwegian packaging group, family owned and not listed on the stock exchange. Annual turnover is NOK 3,5 billion with 2.200 employees and 15 product units in the Nordic countries.

The project was carried out at Peterson Linerboard in Moss, which produces pulp and paper, and had in 1999 a total production of 131 000 tons of unbleached sulphate cellulose and 204 000 tons of kraftliner. Its main markets are in Western Europe.

Peterson Linerboard is situated within the city of Moss, a city with 27 000 inhabitants, located 50 km south of Oslo.

The plant is certified according to EMAS.

3. Project Objectives and Organising

The main goal of the project was to improve the environmental performance at Peterson Linerboard.

This was to be achieved by:

- Improvement of the environmental performance indicators
- Improve the communication processes towards external stakeholders
- Give input to the NORDEPE-project concerning results from this process

The project was organised as follows.

A working group had the following members:

Research Manager Per Arne Syrrist, Peterson Group

Environmental Manager Ellen Hilde Grøm, Peterson Linerboard

Researcher Elin Økstad and Ole Jørgen Hanssen, Østfold Research Foundation

Information Manager Ivar Vestby gave valuable input to the working group.

The project was presented and discussed regularly by the top manager at Peterson, who acted as a steering group for the project.

4. Project Methodology

4.1 Project Methodology

The project followed the general methodology given by ISO 14031 "Environmental Performance Evaluation" as well as the internal methodology developed in the NORDEPE project¹. A brief outline of the methodology is given by figure 1:

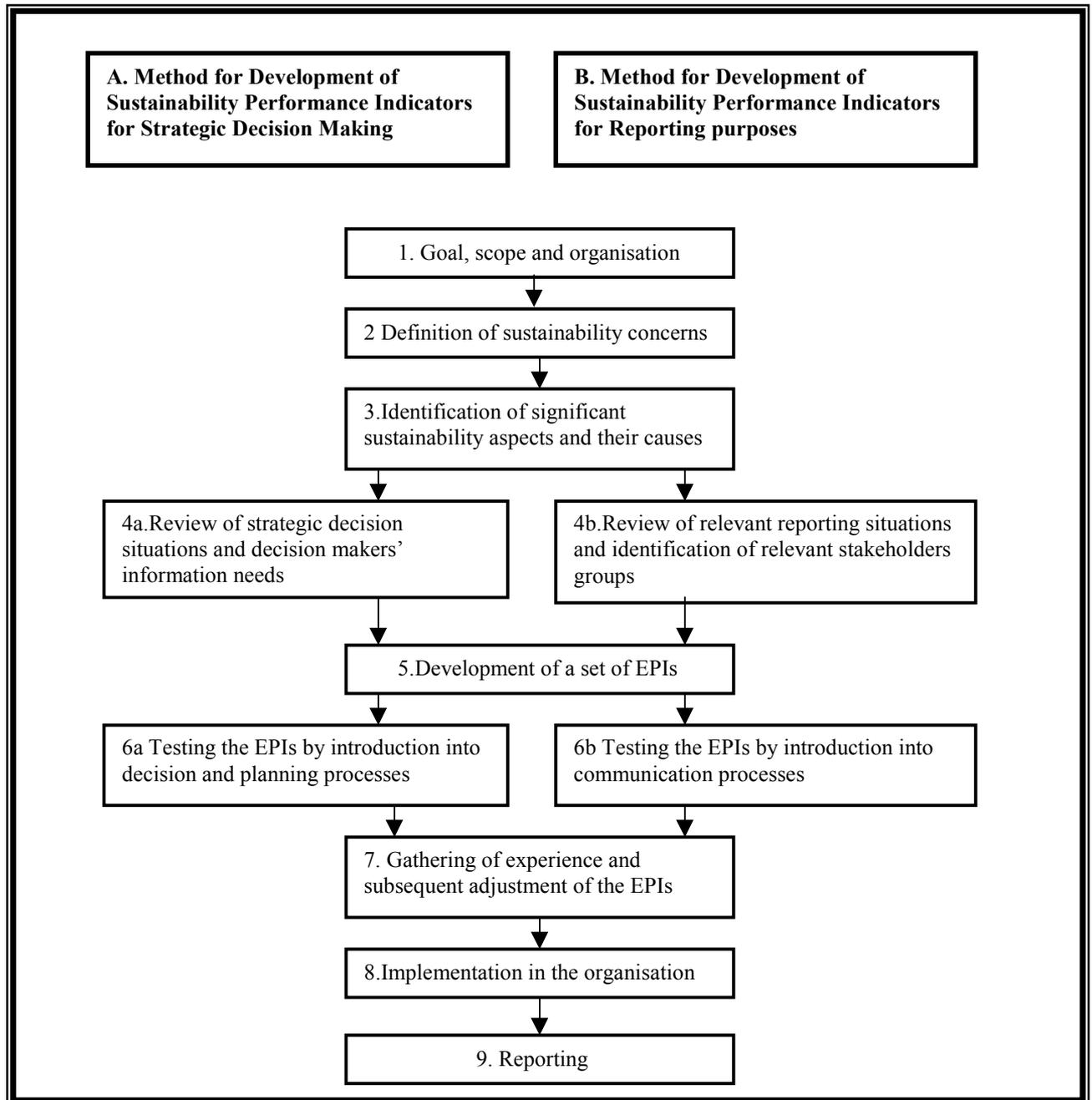


Figure 1: General methodology for development of Environmental Performance Indicators

¹ See Main report from the project (referanse)

4.2 Metodology for the case project

The general framework given in figure 1 was modified and adjusted to the case project, and resulted in this project plan:

1. Define the organisational and geographical framework for the project
2. Define existing sustainability concerns
3. Carry out a stakeholder assessment in order to
 - define future environmental challenges for Peterson in a short and long term basis
 - assess how present environmental reporting and communication is perceived by the stakeholders
 - gather experience with extended stakeholder communication
4. Develop additional environmental performance indicators according to findings from the stakeholder assessment.
5. Give input to general methodology development within the NORDEPE-project.
6. Use the results from the stakeholder assessment as a basis for the EMAS reporting for 1999.

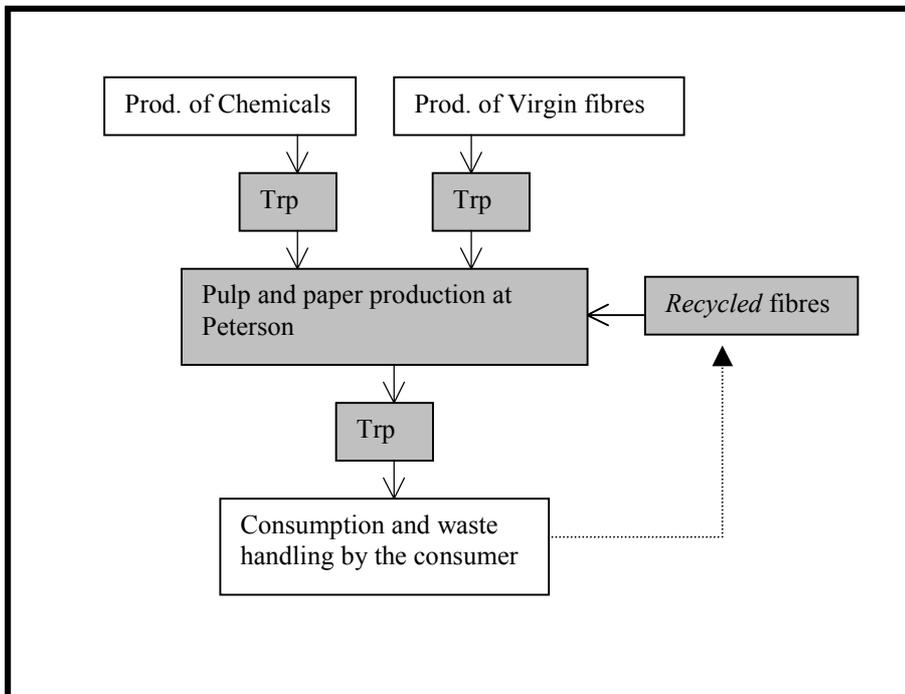
5. Results and discussion

5.1 Definition of the organisational and geographical framework

The total organisation of Peterson Linerboard was the organisational framework of the study.

The production site in Moss as well as the transportation of raw materials and products was the geographical framework of the study.

Figure 1 illustrate the life cycle of paper production at Peterson Linerboard- The grey boxes indicates the focus points of this study, whereas the white boxes represents activities not included in the study.



5.2 Definition of existing sustainability concerns

From former environmental reviews, the most important environmental aspects for Peterson were defined as follows:

<p><u>Raw material/resources:</u></p> <ul style="list-style-type: none">- use of timber- biodiversity in forestry- consumption of water- consumption of chemicals- use of <i>recycled</i> fibres as raw material <p><u>Energy carriers and energy efficiency</u></p> <ul style="list-style-type: none">- utilisation of black liquid- consumption of oil and electricity- (regulation of the water fall) <p><u>Wastes</u></p> <ul style="list-style-type: none">- disposal of wastes- utilisation of wastes- control with waste treatment <p><u>Discharges to water</u></p> <ul style="list-style-type: none">- quality of the recipient- odour from water discharges <p><u>Discharges to air</u></p> <ul style="list-style-type: none">- odour from gaseous emissions <p><u>Noise</u></p> <ul style="list-style-type: none">- noise from process and transport <p><u>Esthetical properties of the plant</u></p>
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5.3 The Stakeholder assessment

5.3.1 Goal and execution of the stakeholder assessment

The goal of the assessment was to

- Clarify if the environmental focus and environmental actions plans of the company was in accordance with the view of the local population and government
- Test out the type and content of the previous EMAS-report to improve the content of the next report
- Gather experience from this type of “large scale” stakeholder communication.

The first task was to identify the stakeholder groups in the local community to be involved in the stakeholder communication process. This selection was done by discussion within the project group. The following groups were picked out: Neighbours of the plant, leaders in local public administration, Environmental NGOs and own employees. These groups were assumed to be the groups most affected by the activity at Peterson, directly in their homes, or indirectly by their professions or affiliation to organisations. Young people in Moss were also seen as a major target group, because they reflect the “views of tomorrow”.

Because of the rather limited time available for the stakeholder assessment, as well as the defined goals of the assessment, it was regarded important to construct the assessment to reflect the views of these specific groups, and not to reflect the general opinion from all inhabitants in Moss.

Thus, the following methods was chosen for the assessment of stakeholder opinions:

- distributing questionnaires to a larger number of people in the local community
- in-depth interviews with representatives from some stakeholder groups.
- focus group with representatives from neighbourhood organisations

The assessment was announced to the public through local newspapers.

The questionnaire was distributed to

- All households in four areas of the city of Moss. The areas are those closest to the company and assumed to be the most affected by the production activities. Altogether 1330 questionnaires were distributed to households.
- 150 students (age between 16 and 19) at a secondary school in Moss. The questionnaires were sent to the school, and distributed by the teachers.
- All employees (425) at Peterson. The questionnaires were distributed to the households.

The respondents should agree or disagree on a set of statements concerning environmental issues in general, and local issues in particular (in particular noise, water pollution, odours). One open question was included, in order to give the opportunity to address issues not covered by the questionnaire. The questionnaire is given in annex 3.

In-depth interviews were carried out with leading community officers. The questions were sent in advance, and focused on the same themes as in the questionnaires – environmental aspects in general and local aspects in particular. The interviews should also focus on aspects around communication and information to both community officers and the population.

The in-depth interviews should also include representatives from local NGOs, but no general environmental organisation² was found active in Moss at the time of the assessment.

A focus group was gathered with representatives from neighbourhood organisations (velforeninger). In the focus group, the issues were the same as from the questionnaires, but no alternative answers were given. The group should also prioritise among the environmental aspects in focus, and to give advice on future communication processes.

² “Protest” organisations against the building of golf courses were found active, but these organisations was not regarded general enough for this assessment.

All households or people receiving the questionnaire or participated in an interview should also receive the main results from the assessment, as well as the new EMAS-report.

5.3.2 Results - from the questionnaires

558 out of a total of 1905 questionnaires were answered and returned.

The highest answering rate was in the groups of students from secondary school (69%). This makes the results statistically representative for this age group in Moss. From the households the answering rate was 32%, which is regarded as quite high for this type of anonymous questionnaire. The lowest answering rate was among the employees at Peterson (30%). This was lower than expected.

It was a positive response from the local community for dialogue and openness about the theme. The company had good press coverage of the assessment.

The results extracted from the questionnaires was that:

- Traffic, smell and noise³ were the main environmental concerns of the neighbours..
- The younger age groups (below 20 and between 20 and 40 of age) were the most critical to the environmental condition in general and most concerned about the environmental contribution from Peterson. The older part of the respondents was less critical to Peterson, and the most satisfied with the environmental conditions.

Examples of the answers given by each age group are given in the figure 5.1 and 5.2. They illustrate a significant difference in the answers between the age groups.

Figure 5.1. illustrates the answers from respondents agreeing with statements concerning bad smell.

³ Noise was not included in the questionnaire, but the respondents gave a high number of remarks regarding noise.

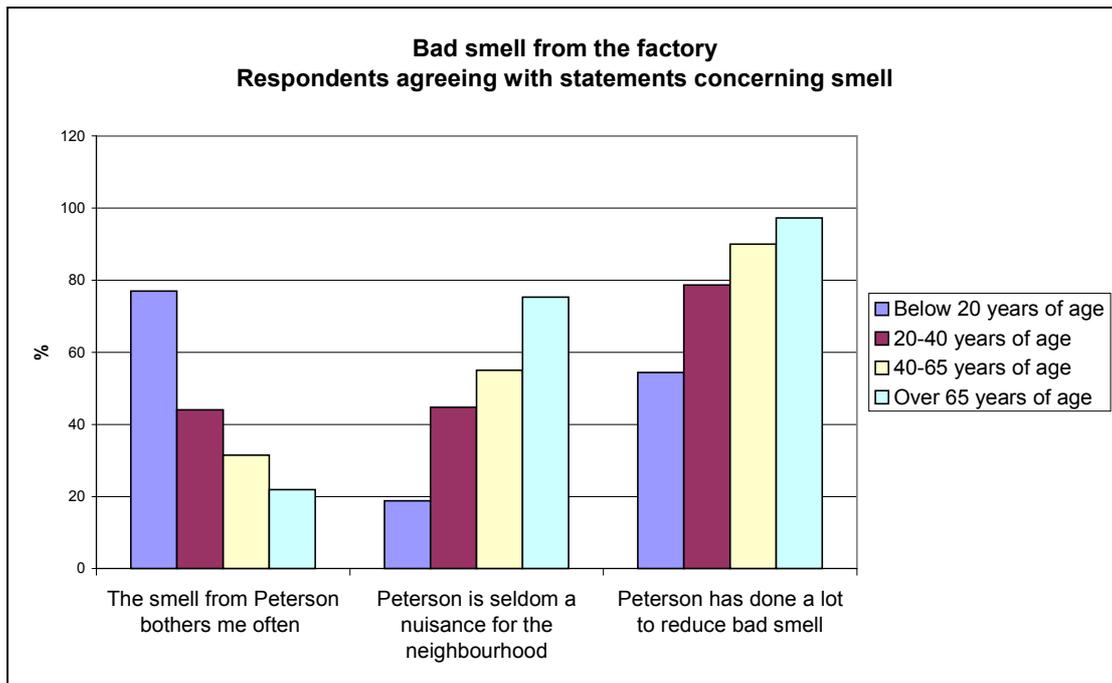


Figure 5.1

The figure shows that the younger age groups are the most bothered by the smell, and they do not agree with the statement “Peterson has done a lot to reduce bad smell”.

Figure 5.2 illustrates the answers from the respondents agreeing with statements concerning air pollution. Again, the younger age groups are the most critical.

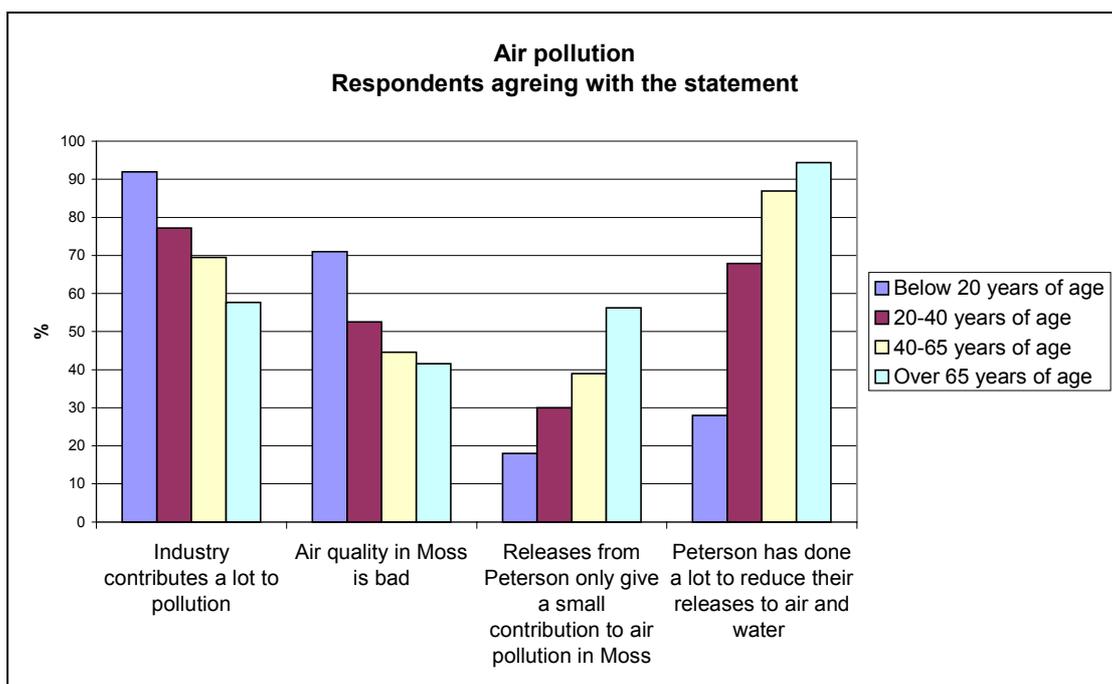


Figure 5.2

A factor analysis was undertaken with basis in the returned answers of the questionnaires. The analysis illustrated that older men, with a long residence time in Moss and often a present or former employee at Peterson, are positive to the environmental performance reported and experienced. Women, between 40 and 65 years old, see traffic as an important environmental aspect in society. They are in general not negative to the environmental performance from Peterson.

5.3.3 Results - from the interviews and focus group

The interviews worked out very well because the participants all had knowledge of Peterson, and was then able to communicate specific opinions and views.

Several specific proposals to improve communication were proposed in the interviews by the two groups.

The EMAS-report should use less technical expressions, and focus more on the effects from the activities, rather than a high focus on the emissions from the company. Assessments from third parties were regarded as important to make the report “believable”. Local conditions such as traffic/transportation and noise should be focused higher than today.

5.3.4 Results – proposed scheme of action

On the basis of the questionnaires and interviews, a proposal for a scheme of actions was developed. This is given in annex 4.

5.3.5 Discussion related to the method

The assessment was perceived positively by the neighbours as well as the local community. The response from the employees was more divert, and since the answering rate in this group was low, it has been difficult to evaluate the answers from this group.

The assessment gave good results, but had some weaknesses:

- The assessment of the employees should have been better anchored in the organisation. Direct communication with employees might be a better approach than questionnaires.
- The households should have been divided in several geographic areas, in order to differentiate between the answers from the distance to the factory

In general, the incoming material would be easier to analyse if the respondent had given more personal characteristics (such as occupation, income etc.). This was not done because of the fear that this would have prevented some from answering the questionnaire.

The interviews with the representatives from the local community were carried out before the questionnaires were returned and analysed. Therefore, the results from the questionnaires were not available for designing the interviews. However, the interviews gave input to improvements of the communication processes.

Representatives from three neighbourhood organisations were invited to participate in a focus group. The dialogue within the focus group gave the opportunity for in-depth discussions regarding the results abstracted from the questionnaires. The participants were

also able to prioritise on actions, and gave input to improvements of the communication process.

5.4 Revision of methodology for stakeholder assessment

Based on the experiences from the stakeholder assessment, the methodology for stakeholder assessment was revised. The method is given in annex 4, and in the methodology report from this project.

5.5 Benchmarking between EMAS report and GRI Guidelines

In the Nordic project, benchmarking of several environmental reports with the draft guidelines of the Sustainability Reporting Guidelines from Global Reporting Initiative⁴ was undertaken. The Peterson Linerboard EMAS report 1997 was included in this evaluation. The results from the benchmarking of the Peterson Emas Report with the GRI Guidelines is given in annex 6 in a table showing items covered by the EMAS report, Items partly covered by the report, and items not covered at all.

According to the table, the Peterson EMAS report was in accordance with the guidelines on topics concerning operation performance and major key indicators. The report was not accordance with the GRI guidelines on topics concerning stakeholder relationships, product performance or overview on sustainability concerns.

5.6 Proposal of communication procedures and indicators

5.6.1 Immediate actions taken based on the results from the assessment

The following immediate actions was taken and reported in the EMAS-report:

- Information to transport companies stating that speed limits has to be obeyed in the neighbourhood.
- Implementation of noise reducing devices.
- Implementation of actions to reduce peaks of odorous emissions.

These actions are expected to improve the local conditions around the plant.

⁴ The Global Reporting Initiative (GRI) is a long-term, multi-stakeholder, international undertaking whose mission is to develop and disseminate globally applicable Sustainability Reporting Guidelines for voluntary use by organisations reporting on the economic, environmental, and social dimensions of their activities, products and services. www.globalreporting.org

5.6.2 Communication procedures

Based on the results of the stakeholder assessment, communication procedures should be made between the focus groups identified and the following areas of environmental concern:

	Employees	Households	Students/ Young people	Local government
Noise from mill		X		
Odour		X	X	X
Traffic		X		
Water quality		X		X
Communication related to environmental issues	X	X	X	

The stakeholder assessment showed very clearly that personal contact with representatives from neighbourhood organisations as well as the representatives from local government was very useful and constructive. This type of personal contact should be continued on a regular basis, and should become a vital part of the environmental steering system for mapping neighbourhood opinions.

Since the stakeholder assessment found that young people had the most negative views regarding the environmental performance from Peterson and towards industry as a whole, a follow up of this group is important. Today, Peterson runs an information programme to support better information between the industry and students. The results from this project should be used for strengthening the communication through this existing programme.

The stakeholder assessment gave no clear answers towards the employees at Peterson Linerboard and environmental communication, except that communication procedures must be improved. These communication processes should be addressed further in the continuous development of EMAS and the internal control systems.

The table summarised the proposed communication processes for the different stakeholder groups.

Employees	Improve communication processes in connection with development of EMAS and the Internal Control, including the participation of reporting environmental results from their department.
Households/Neighbourhood	Invite neighbourhood organisations (“velforeninger”) to regular meetings for discussion of the environmental impacts related to the operation of the factory. Continue to distribute the annual environmental report
Students/Young people	Should be developed further as a part of the established programme for students and schools.
Local government	Invite representatives from local government (health-and environmental officers) to regular meetings for discussion of the environmental impacts from the factory. Distribute the annual environmental report.

The company will also assess the possibilities for electronic publishing of the environmental report at the web-site, as well as publishing environmental data on the net. This can enable more frequent and updated distribution of environmental information, and give the stakeholders a more easy access to this information.

5.6.3 Development of operational Indicators

Peterson has a system for continuous monitoring and follow up of relevant parameters to air and water (Suspended solids, Chemical oxygen Demand (COD), odour (H₂S), energy consumption and emissions related to energy). These parameters have been reported to the authorities on a regular basis for several years, and to the public through environmental reports.

However, the stakeholder assessment indicated that “noise”, odours, water quality and transport/traffic needed a closer follow up.

Possible indicators for these areas are suggested:

Indicator on	Possible indicator	For use by	To be used in
Traffic to/from mill -Transport	<ul style="list-style-type: none"> Amount of products transported out by ship/Total amount of products. Speed limits in neighbourhood 	-Choice of transport -Actions plans - Contracts with transporters	Internal management systems External communication
Noise level from mill	Neighbourhood opinions shall be mapped by regular meeting with the neighbourhood organisations and local community officers.	- Action plans and budgeting to reduce noise	Internal management systems External communication
Odour	Number of complaints. Neighbourhood opinions shall be mapped by regular meeting with the neighbourhood organisations and local community officers.	Action plans and budgeting	Internal management systems External communication
Water quality	Water quality in the recipient monitored by regular (annual) measurements of oxygen and turbidity.	Action plans and budgeting	Internal management systems External communication

As can be seen from the table, no quantitative indicator was found for noise or odours. The experience of noise and bad smell in the neighbourhood is more important to map than absolute values. Rather than installing a complicated monitoring programme, it was decided to improve communication procedures within these areas.

5.7 Experiences by participation in the project

Many of the results from the case project have already been implemented in the organisation, and others will be implemented in the near future. The project has thus been very useful for developing the environmental management systems and planning of the communication processes with internal and external stakeholders.

The participation in the Nordic project, which included activities such as method development and exchange of experiences with the total project group, has also been useful. These meetings had maybe a somewhat too academic orientation, which was both challenging and sometimes of little relevance for the actual situation at Peterson. However, the total impression was that such meetings provided interesting and mind opening discussions.

6. Conclusions

- In the case project carried out at Peterson Linerboard, a stakeholder assessment was carried out in the local community in Moss. This stakeholder assessment gave important input to the development of the environmental management systems as well as improvement of the communication with internal and external stakeholders. Some of the results were used directly in the EMAS report. The stakeholder assessment gave positive feedback from the local community, but requires follow up actions towards the groups asked to participate in the assessment.
- The stakeholder assessment gave important input to the development of methodology for stakeholder assessments in the Nordic project.
- The type of project activities, represented by company internal project work combined with method development and exchange of experiences in joint Nordic project meetings, served as important drivers for project escalation. It gave also valuable knowledge on present activities and strategies in other (and larger) Nordic companies.

7. Annexes

7.1 Annex 1: Participation and reporting in the project

Case companies:

Companies	Sector	Contact person
Tetra Pak S-22100 Lund	Packaging production	Lars Lundahl
AstraZeneca AB S-15185 Södertelje	Pharmaceutical production	Helena Uddholm Birgitta Thorsin
Akzo Nobel S-44485 Stenungsund	Chemical production	Bertil Norberg Klas Hallberg
M. Peterson & Søn N-1501 Moss	Pulp and paper production	Per Arne Syrrist Ellen Hilde Grøm
Sydkraft SE-20509 Malmö	Energy production	Rolf Henriksson Maria Sunér
Norsk Leca N-0614 Oslo	Construction materials	Knut Vaage
FORTUM Power and Heat Fin-00048 Fortum, VANTAA	Energy production	Pekka Järvinen Hannu Härkönen
UPM-Kymmene FIN-00101 Helsinki	Pulp and paper production	Kari Ebeling Nina Norjama
Norcem N-3950 Brevik	Cement production	Erik Stoltenberg Hansson
Cementa AB S-620 30 Slite	Cement production	Gunnel Pott

Following companies:

Companies	Branch	Contact person
STORA ENSO Group FIN-00101 Helsinki	Forest industry	Anneli Suotsalo
Lännen Tehtaat Oy FIN- 27821 ISO-Vimma	Food Production & Engineering	Juhani Hvitfelt
METSO Corp FIN 00101 Helsinki	Forestry	Pirjo Kaivos
Elkem N-0303 Oslo	Ferroalloys and silicon metal	Inger Johanne Eikeland
Statsbygg (N), N-0032 Oslo	Real estate	Zdena Cervenka Stein Rognlien
ESAB SE-40277 Göteborg	Welding and cutting equipment	Stefan Larsson
Volvo Personvagnar SE-40508 Göteborg	Car manufacturing	Agneta Wendel
Perstorp SE-28480 Perstorp	Chemical production	Henrik K. Ny

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Participating SME-companies within the transport sector:**Participating transport companies:**

Company	Contact person
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Sørum Transport AS	Harry Nilsen
Haukebøe Transport AS	Elling Haukebøe
Kristian Gerhard Jebsen Skipsrederi AS	Haktor Øvrevik

7.2 Annex 2: Reports from the project

Main report from the Nordic project for development and implementation of Environmental Performance Indicators in Industry.

Johan Thoresen & Elin Økstad & Ole Jørgen Hanssen, Østfold Research Foundation, Norway, Bo von Bahr & Bengt Steen, CPM, Chalmers University of Technology, Sweden; Elin Eriksson & Petra Bäckman, Chalmers Industriteknik, Sweden,
Rabbe Thun & Virve Thulenheimo, VTT Industrial Environmental Economics, Finland
Kristian Løkkegaard, Ernst&Young, Danmark

METHODOLOGY REPORTS

Statistical Properties of Emission Data in the Nordic Cement Industry

Bo von Bahr, CPM, Chalmers University of Technology, Sweden; Ole Jørgen Hanssen & Mie Vold, Østfold Research Foundation, Norway, Gunnel Pott, Cementa AB, Sweden and Erik Stoltenberg-Hansson, NORCEM, Norway

Environmental Supply Chain indicators for the transport sector. Methodological approach and examples.

Lars von Krogh, Ole Jørgen Hanssen, Elin Økstad: Østfold Research Foundation, Norway

Performance Indicators for External Reporting and Green Rating

Virve Tulenheimo, VTT Industrial Environmental Economics, Finland; Petra Bäckman, Chalmers Industriteknik, Sweden and Elin Økstad, Østfold Research Foundation, Norway

Methodological Approach for Development of Indicators for Strategic Decision-making in Industrial Companies

Johan Thoresen, Østfold Research Foundation, Norway; Elin Eriksson, Chalmers Industriteknik, Sweden and Rabbe Thun, VTT Industrial Environmental Economics, Finland

Methodology Approach for Selection of significant sustainability aspects

Bengt Steen, CPM, Sweden

CASE STUDIES

Akzo Nobel AB

Development of a Process and a Measurement System to Achieve Continuous Reduction of the Ecological Effects of Operations and Products at Akzo Nobel Surface Chemistry

Klas Hallberg, Akzo Nobel; Elin Eriksson, & Ulf Östermark, CIT, Sweden
Akzo Nobel AB

CEMENTA AB and NORCEM

Environmental performance indicators for external and internal communication

Case report from Cementa and Norcem

Mie Vold & Ole Jørgen Hanssen, Østfold Research Foundation, Norway, Gunnel Pott, Cementa, Sweden; Erik Stoltenberg-Hansson, Norcem, Norway; Bo von Bahr, CPM, Sweden

FORTUM Power and Heat Oy

Backcasting for Sustainable Strategies in the Energy Sector

Jaakko Kuisma, IIIIEE, Lund University, Sweden; Virve Tulenheimo & Rabbe Thun, VTT Industrial Environmental Economics, Finland and Pekka Järvinen, FORTUM Power & Heat Oy, Finland

M. Peterson & Son

Environmental performance indicators for communication in the local community.

Elin Økstad, Østfold Research Foundation, Ellen Hilde Grøm, Peterson Linerboard, Norway

a.s. Norsk Leca

Environmental Performance Indicators for Strategic Decision making

Johan Thoresen, Østfold Research Foundation, Knut Vaage, as Norsk Leca

SYDKRAFT AB

Development and Testing a System for Benchmarking of Environmental Management Performance

Yoke Mun Chan, IIIIEE, Lund University, Sweden; Rabbe Thun, VTT, Finland and Maria Sunér, Sydkraft, Sweden

Identification of Internal Indicators for Sustainable Corporate Decision-Making - A feasibility study for the establishment of business-related travel

Joscelyne M. Shaw, IIIIEE, Lund University, Sweden; Rabbe Thun & Virve Tulenheimo, VTT Industrial Environmental Economics, Finland and Maria Sunér, Sydkraft, Sweden

Sustainable Development and Corporate Reporting: Selecting Indicators from Stakeholder Dialogue

Narine Sargsyan, Lund University, Sweden; Rabbe Thun & Virve Tulenheimo, VTT Industrial Environmental Economics, Finland and Maria Sunér, Sydkraft, Sweden

Corporate Environmental Assessment and Strategic Acquisitions

Anastasia O'Rourke, IIIIEE, Lund University, Sweden; Rabbe Thun & Virve Tulenheimo, VTT Industrial Environmental Economics, Finland and Maria Sunér, Sydkraft, Sweden

Tetra Pak AB

Identification of Strategic Environmental Performance Indicators

Lars Lundahl, Tetra Pak; Elin Eriksson & Ulf Östermark, CIT, Sweden

UPM-Kymmene Oyj

Indicators for Sustainable Strategies based on Backcasting the Future

Rabbe Thun & Virve Tulenheimo, VTT Industrial Environmental Economics, Finland; Kari Harjunen & Ari Tiihonen, PricewaterhouseCoopers, Finland and Kari Ebeling & Nina Norjama, UPM-Kymmene Oyj, Finland

7.3 Annex 3: stakeholder analysis – questionnaire and results

SPØRRESKJEMA

Hva vet du om Peterson i Moss (Peterson Linerboard)?

Hvor mange ansatte er det på Peterson?	Ca 100 <input type="checkbox"/>	Ca 400 <input type="checkbox"/>	Ca 700 <input type="checkbox"/>	
Hva produserer Peterson ?	Bølgepapp <input type="checkbox"/>	Brunt Papir <input type="checkbox"/>	Avispapir <input type="checkbox"/>	
Hvor stor andel returfiber inngikk som råvare i produksjonen i 1999?		Ca. 10% <input type="checkbox"/>	Ca 30% <input type="checkbox"/>	Ca. 50% <input type="checkbox"/>
Peterson bidrar til en betydelig verdiskapning i Mossedistriktet. Hvis denne verdiskapningen regnes om til arbeidsplasser – Hvor mange arbeidsplasser blir det totalt?	Ca 1500 <input type="checkbox"/>	Ca 3000 <input type="checkbox"/>	Ca 5000 <input type="checkbox"/>	

Hvor enig eller uenig er du med følgende påstander om samfunnets miljøutfordringer ?

	Svært uenig	Noe uenig	Vet ikke	Litt enig	Svært enig
Trafikk er et stort miljøproblem	<input type="checkbox"/>				
Industrien forurenses mye	<input type="checkbox"/>				
Forurenset vann er et betydelig miljøproblem i Moss	<input type="checkbox"/>				
Det er dårlig luftkvalitet i Moss	<input type="checkbox"/>				
Miljøproblemene kan løses når alle bidrar	<input type="checkbox"/>				
Både private og bedrifter må betale mer når de forurenses og skader miljøet	<input type="checkbox"/>				

Hvor enig eller uenig er du i følgende utsagn om hvordan Peterson driver sin virksomhet?

	Svært uenig	Noe uenig	Vet ikke	Litt enig	Svært enig
Lukta fra Peterson sjenerer meg ofte	<input type="checkbox"/>				
Utslipp fra Peterson betyr lite for forurensning i Mossesundet	<input type="checkbox"/>				
Utslipp fra Peterson betyr lite for forurensning av luften i Moss	<input type="checkbox"/>				
Trafikk til og fra Peterson er lite sjenerende for omgivelsene	<input type="checkbox"/>				
Avfall fra produksjonen til Peterson er ikke et stort miljøproblem	<input type="checkbox"/>				

	Svært uenig	Noe uenig	Vet ikke	Litt enig	Svært enig
Peterson er sjelden en plage for sitt nærmiljø	<input type="checkbox"/>				
Peterson gir god nok informasjon til sine naboer om sin drift	<input type="checkbox"/>				
Fabrikkområdet til Peterson er ryddig og ordentlig	<input type="checkbox"/>				
Peterson bidrar til å bevare gamle hus/kulturminner	<input type="checkbox"/>				
Peterson har kommet langt med å redusere lukt til omgivelsene	<input type="checkbox"/>				
Peterson har gjort en stor innsats for å redusere utslipp til luft og vann	<input type="checkbox"/>				
Det er bra for miljøet at Peterson bruker returpapp for å lage nytt papir	<input type="checkbox"/>				

Har du spørsmål om Peterson i Moss som du ønsker besvart? (Bruk evt. et eget ark)

Informasjon om deg som svarer på dette spørreskjemaet

Mann	<input type="checkbox"/>	Alder: Under 20:	<input type="checkbox"/>	Har bodd i Moss:	Under 5 år	<input type="checkbox"/>
Kvinne	<input type="checkbox"/>	Mellom 20 og 40	<input type="checkbox"/>		Mellom 5 og 15 år	<input type="checkbox"/>
		Mellom 40 og 65	<input type="checkbox"/>		Over 15 år	<input type="checkbox"/>
		Over 65	<input type="checkbox"/>		Bor ikke i Moss	<input type="checkbox"/>

Hvor arbeider du?	I Moss	<input type="checkbox"/>
	Utenfor Moss	<input type="checkbox"/>
	Hos Peterson	<input type="checkbox"/>
	Ikke noen av de tre over (hjemmearbeidende/skoleelev/pensjonist)	<input type="checkbox"/>

Er du kjent med tidligere miljørapporter fra Peterson? Ja Nei

Factor analysis of the respondents (skal dette være med???)

- Give a statistically independent grouping of different issues compared to a small number of axes – reduces the number of relevant parameters in the analysis
- Viser sammenhengen mellom parametre og akser, og akser og egenskaper ved respondentene - bidrar til å lage mer homogene grupperinger på tvers av forhåndsdefinerte kategorier

Results from the factor analysis

	Opinions	Characteristics of respondent
PCA 1	This group is in general very positive to Peterson's environmental performance, and has the opinion that the production has little impact on the environment in the city.	Male, older generation lived more than 15 years in Moss, work at Peterson
PCA 2	This group see traffic as one of the most important environmental aspects, and hold the opinion that companies must pay more and that industry in general contributes a lot to the environmental problems. Is <u>not</u> very negative to Peterson, and has the opinion that Peterson has developed positively in environmental matters. Transport of raw materials and products to and from Peterson is the most negative issue.	Woman, between 40 and 65 years old, household groups of respondents, lived in Moss for more than 15 years, work in Moss
PCA 3	Industry has a poor performance regarding environmental matters. Peterson gives only a small contribution to the problems. Very negative to use of recycled fibres.	

Korrelasjonsanalyse

	Trafikk stort miljøproblem	Forurenset vann miljøproblem	Miljøproblem løses hvis alle bid	Private bedrifter må betale mer	Dårlig luftkvalitet i Moss	Lukt fra Peterson sjenerer ofte	Utslipp vann fra Peterson betyr lite	Utslipp fra Peterson lite luft	Industrien forurenses mye	Avfall fra prod. betyr lite	Peterson sjelden plage nærmiljø	Peterson kommet langt i reduksjon	Trafikk til/fra Peterson ikke prb	Bra at Peterson bruker returpapp	Har bodd lenge i Moss
Traffic important environmental problem															
Forurenset vann miljøproblem	++														
Miljøproblem løses hvis alle bid	++														
Private bedrifter må betale mer	++	++	++												
Dårlig luftkvalitet i Moss	++	++													
Lukt fra Peterson sjenerer ofte	++	++			++										
Utslipp vann fra Peterson betyr lite	--	--			--										
Utslipp fra Peterson lite luft		--		-	-										
Industrien forurenses mye	++	++	++	++	++	++									
Avfall fra prod. betyr lite	--	--	+		--	++		--							
Peterson sjelden plage nærmiljø	-	--			--	++		--	++						
Peterson kommet langt i reduksjon		--			--	++		--	++	++					
Trafikk til/fra Peterson ikke prb	-			--	--	+		--	++	++					
Bra at Peterson bruker returpapp															
Har bodd lenge i Moss							++		++	++	++				

7.4 Annex 4: Matrix of action

Scheme of action: Groups of respondents:

Negative perception of industrial activity				
Smell from the plant				
Noise from the plant				
Water quality in Moss				
Traffic from the plant				
Waste from the plant				
Orden/Estetikk				
Information / communication				
	Employees	Households	Students secondary school	Public officers

Scheme of action: – personal properties of the respondent:

	Age groups				Time of residence in Moss		Male/Female	
Negative perception of industrial activity								
Smell from the plant								
Noise from the plant	Can not differensiate between groups							
Water quality in Moss								
Traffic from the plant								
Waste from the plant								
Orden/Estetikk								
Information / communication								
	Under 20 years old	Age 20 to 40 years old	Age 40 to 65 years old	Over 65 years old	Long Bodd kort tid i Moss	Bodd lenge i Moss	Male	Female

7.5 Annex 5: Method development – Stakeholder assessment

Stakeholder Assessment

This describes a six-step method for carrying out a stakeholder assessment.

Examples

1. Define the purpose of the stakeholder assessment

- basis for improved communication with stakeholders
- basis for a better selection and priority of environmental actions plans and investments

2. Identify and classify relevant stakeholder groups

- identify stakeholder categories
- segregate the stakeholder into defined sub-categories



Stakeholder categories

Examples of Stakeholder categories	Stakeholder sub-categories
Neighbours	Age groups, residence-time in the area, education, hobbies and interests, political opinion
Customers	Age groups, income, level of education, hobbies
Employees	Age groups, type of work, type of education,
Owners	Type of owner, amount of ownership
Authorities	type of responsibility
NGOs	Type of organisation

3. Define the type of assessment

- Closed process by testing predefined hypothesis
- Open process by asking for stakeholder opinions
- Criteria for conduction a representative assessment

4. Selection of method of the assessment

- sending questionnaires to larger groups
- discussion by focus groups
- interviews of selected representatives
- interviews of expert panels
- systematise internal knowledge
- systematise information from media

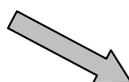


Method selection

Stakeholder Selection	Possible methods
Neighbours	Questionnaires, focus groups with selected representatives.
Customers	Questionnaires, interviews with selected groups, focus groups.
Employees	Focus groups, questionnaires, interviews with club leaders.
Owners	Interviews of selected representatives.
Authorities	Interviews, expert groups
NGOs	Interviews, expert groups

5. Evaluation and analysis

- Evaluation of representativeness of the different stakeholder groups
- Analysis of results (Factor analysis, analysis of correlation between respondents)



Factor analysis

Gives a statistical independent grouping of different issues – reduces the number of relevant parameters in the analysis.

6. Conclusions

- what type of information is important to provide the different stakeholder groups
- prioritisation of actions on the basis of the assessment
 - what type of information is important to different stakeholder groups
 - plans for further communication

Issues	Type of stakeholder groups
Positive to the issue	Young customers with high income, major owners, long resident neighbours
Negative to the issue	Customers over 40 years old, neighbours with short resident time, low income

7.6 Annex 6 - Benchmarking

This table gives the results of a benchmarking between draft reporting procedures from Global Reporting Initiative (GRI) in 1999 and the EMAS report from Peterson in 1997.

The GRI guideline was revised in 2000 (www.globalreporting.org)

Items covered by the Peterson EMAS 1997 report	Items partly covered by the Peterson EMAS 1997 report	Items not covered by the Peterson EMAS 1997 report
CEO STATEMENT		
Performance on benchmarks versus previous years and industry norms	Acknowledgement of successes and failures Major sustainability challenges for the enterprise and its business sector as a whole	Explicit statement of decision to apply the GRI Guidelines to the report Highlights of report content and commitment to targets
KEY INDICATORS		
Key environmental, social, and economic issues and impacts associated with operations, products and/or services Number, volume, and nature of accidental or non-routine releases to land, air, and water, including chemical spills, oil spills, emissions resulting from upset combustion conditions Indicators of occupational health and safety Total energy use Total materials use other than fuel Total water use Quantity of non-product output (NPO) returned to process or market by recycling or reuse by material type and by on- and off-site management type Quantity of NPO to land by material type and by on- and off-site management type Emissions to air, by type Discharges to water, by type		Major stakeholder groups Indicators of social and economic aspects of operational performance Major environmental, social, and economic impacts associated with the life cycle of
PROFILE OF REPORTING ENTITY		
Name of enterprise or other reporting entity Major products and/or services Nature of ownership; legal form; stock exchange listings Contact person(s) regarding report Net sales Number of employees Product (mass/amount/quantity) Coverage of report (countries, products/services, divisions/facilities/joint ventures/ Reporting period (e.g., fiscal/calendar year) for information provided	Nature of markets or customers served (e.g., retail, wholesale, governments) Principal industry and business association memberships Key environmental, social, and economic issues and impacts associated with operations, products and services. Significant changes in size, structure, ownership, products/services, that have occurred Public accessibility of information or reports about environmental, social, economic, or similar performance, including how to obtain copies of such reports	Financial information (breakdown of sales/revenues by country for those countries that comprise five percent or more of total revenues, as well as by major products and/or services identified in item * Dept/equity ratio Employee wages/salaries/benefits Total taxes Total assets Other(s) (e.g., gross margin, value added, net profit) **Other relevant information regarding enterprise activity level including measures that may be used for normalisation of absolute values provided in the report Total floor space Other(s) as appropriate Date of most recent previous report, if any
POLICIES, ORGANIZATION, AND MANAGEMENT SYSTEMS		
Environmental, social, economic, or similar charters, codes, or voluntary initiatives subscribed to, including date of adoption and countries of applicability Management systems pertaining to social and environmental performance (e.g., ISO 14001 EMAS, employee orientation and awareness programs, social auditing ... Status and date, by country, of environmental, social, economic, or similar external certification (e.g., EMAS, ISO 14001, SA 8000)		Publicly available missions and value statement(s), and statements of economic, social, and environmental policy, including date of adoption and countries of applicability Organisational structure and responsibilities (e.g., board, senior management, special staff, operating staff, committee and councils) for oversight and implementation of environmental, social, economic, and related policies ^^ Management systems for supplier and supply chain (including outsourcing), including selection criteria, training, monitoring, and other procedures and

		practices, and countries of applicability
STAKEHOLDER RELATIONSHIPS		
		<p>Basis for selection, definition and profile of major stakeholders (e.g., employees, investors suppliers, customers, local authorities, public interest groups, NGOs)</p> <p>Approaches to consultation with each stakeholder (e.g., surveys, focus groups, community panels, written communications).</p> <p>Number of such consultations by type.</p> <p>Type of information generated by such consultations</p> <p>Use of such information (e.g., performance benchmarks and indicators), including applications in this report</p> <p>Plans for strengthening stakeholder consultation</p>
MANAGEMENT PERFORMANCE		
Pertaining to Laws, Conventions, and Other Mandatory Standards		
<p>Number, volume, and nature of accidental or non-routine releases to land, air, and water, including chemical spills, oil spills, emissions resulting from upset combustion conditions</p> <p>Pertaining to Internal Policies and Standards and Voluntary Initiatives</p>	<p>Magnitude and nature of penalties for non-compliance with all applicable international associated with environmental (e.g., air quality, water quality), workplace (e.g., worker and other similar issues. Explain based on countries of operations</p> <p>Response of management to improve performance noted in two previous items</p> <p>Costs associated with environmental compliance: environmental operating costs</p>	<p>Site remediation costs under applicable laws and regulations</p> <p>Performance regarding internal environmental, social, and economic policies and standards and voluntary initiatives discussed in Part "Policies, Organisation, and Management Systems"(excluding supplier issues)</p> <p>Response of management to improve performance noted in previous item.</p> <p>Major awards received in the reporting period regarding environmental, social, economic, or similar performance and activities. Reasons for such awards</p>
Suppliers		
		Supplier performance per item ^^
OPERATIONAL PERFORMANCE		
<p>Indicators of occupational health and safety</p> <p>Total energy use (sum of two next items)</p> <p>Total electricity use. Amount purchased, by primary fuel source, where known. Amount self-generated (describe source).</p> <p>Total fuel use. Vehicle and non-vehicle fuel, by type.</p> <p>Other energy use (e.g., district heat)</p> <p>Total materials use other than fuel, including definition and how calculated</p> <p>Objectives, programs and targets regarding water use and progress toward same</p> <p>Quantity of NPO returned to process or market by recycling or reuse by material type</p> <p>Quantity of NPO to land by material type</p> <p>Emissions to air, by type</p> <p>Objectives, programs and targets regarding routine air emissions and progress toward same</p> <p>Discharges to water, by type</p> <p>Objectives, programs and targets regarding routine discharges to water and progress toward same</p>	<p>Objectives, programs and targets regarding energy use and progress toward same</p>	<p>Objectives, programs and targets regarding materials use and progress toward same</p> <p>Objectives, programs and targets regarding procurement and use of virgin and reclaimed materials and progress toward same</p> <p>Total water use</p> <p>Habitat improvements and damages due to enterprise operations</p> <p>Objectives, programs and targets regarding non-product output returned to process or market and progress toward same</p> <p>Objectives, programs and targets regarding non-product output to land and progress toward same</p> <p>Indicators of social and economic aspects of operational performance within the following categories and aspects</p> <p>Corporate (e.g., ethical standards, bribery/corruption)</p> <p>Employees (e.g., freedom of association, workforce diversity (gender, race, age))</p> <p>Local and Global Community (e.g., community involvement, skills transfer)</p> <p>Suppliers (e.g., procurement standards, partnership screens and standards)</p> <p>Customers (e.g., labelling standards, advertising standards)</p> <p>Additional Indicators of core relevance to the enterprises operational performance, including those arising from stakeholder engagement or other sources (e.g., ISO 14031)</p>
PRODUCT PERFORMANCE		

	<p>Programs or procedures to prevent or minimize potentially adverse impacts of products and services, including product stewardship initiatives</p>	<p>Major environmental, social, and economic impacts associated with the life cycle of products and services, with quantitative estimates of such impacts Formal, written commitments requiring an evaluation of life cycle impacts associated with the use of new and existing products and services offered, and procedures in place to monitor this commitment Procedures to assist product and service designers to create products or services with reduced adverse life cycle impact Additional indicators of core relevance to environmental, social, and economic performance of the enterprise's product(s), including those arising from stakeholder engagement or other sources (e.g., ISO 14031)</p>
SUSTAINABILITY OVERVIEW		
		<p>A discussion of how environmental, economic and social goals and values intersect and are balanced in the organization, and how such linkages and balancing shape the enterprise's decision making. The overview seeks to assist the enterprise in articulating a long-term vision of sustainability, including obstacles and time scales and communicating this vision to stakeholders. The Sustainability Overview is an evolving tool. Reporters should use maximum flexibility</p>