Incorporating Sustainability into Supply (Chain) Management
– The Case of the Volkswagen AG

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Abstract
Companies are perceived as important actors in the drive for sustainability. Linked to this, and in response to increasing demands from various stakeholder groups, companies start to look at their supply chain to enhance their overall sustainability profile. Two major triggers can be identified: (1) focal companies are held responsible for environmental and social problems caused by their suppliers, which become more and more important as (2) an increasing share of value is created at the supplier level. In response to such demands, companies have to find ways to incorporate environmental and social aspects into their supply (chain) management. Therefore, environmental and social standards are integrated into supply management by amending the purchasing processes. This paper presents an approach to integrate social and environmental standards into supply policy and supply management at the Volkswagen AG, a focal company of the automobile industry. Therefore, required changes of the sourcing and supply structures were identified, and possible options for company internal integration are presented.

Keywords: Automotive industry, Sustainability, Supply management, Supply policy, Environmental and social problems
1 Introduction

Sustainable development is sometimes comprehended as an ultimate value system to give orientation for decision making and action in different situations. It can be seen as a framework for companies and their management to transform their responsibility for environmental, economical and social behaviour into business practices within the legitimacy of our society (Ulrich/Puri 1995). As one particular example, the automotive industry constitutes a product system that directly and indirectly relates to economic wealth creation as well as impacts on the natural and human environment along all stages of the product’s life cycle (Warren et al. 2001). Automakers therefore play an important role for the environmental and social development of our world in the context of sustainability. They have to respond to increasingly strict governmental regulation and environmental and social expectations by applying management strategies (Commission of the European Communities 2002).

Today, companies are also confronted with a growing trend towards internationalisation. Globalisation allows working with a lot of different suppliers to get raw materials and preliminary products (horizontal supplier structure), and each first tier supplier often depends on a multilevel supplier chain for their own production (vertical supplier structure). Such a structure makes it difficult for a company to handle the whole supplier network and thus increases the complexity of purchasing (Corswant/Fredriksson 2002). But for sustainability, companies have to ensure manufacturing of products without creating environmental damage or disobeying social standards (Seuring 2004).

This fact represents a significant risk to a company’s public reputation and its attractiveness on the sales market, because it has to take the responsibility for its suppliers in front of the media and critical non-governmental organisations (NGOs) (Scherer et al. 2002; Lawrence 2002). The saturation, fragmentation, and deregulation of mature markets, as well as the intensification of competitive pressure render this reputation even more important for a publicly visible company such as a global automotive manufacturer. Consistently, NGOs uncover inhumane working conditions, especially in developing countries, and reveal how companies make money from these unjust circumstances (Graafland 2002). Directly cohesive with these changes, such inhumane working conditions are discussed (Kraus 1997; Lal 1997). Therefore it is useful to integrate environmental and social aspects in supply policies and supply processes ex ante (Commission of the European Communities 2002). Hence, firms have to identify new criteria for supplier selection and evaluation, aiming at the integration of environmental and social guidelines as well as the implementation of related con-
trol mechanisms and compliance stimuli. These requirements are then passed on to suppliers (Zhu et al. 2005).

Against this background, the paper analyses impacts of environmental and social guidelines on purchasing decisions of a focal company in the car industry. This forms a response to environmental and social risks in the global supply chain. The research is based on the assumption that it is necessary to incorporate sustainability issues into supply (chain) management (Wolters et al. 1997; Seuring/Müller 2004). “Sustainable sourcing” could have a positive impact both on the image of a company as much as on the drive for sustainability of the business (Walton et al. 1998; Hall 2000; Bowen et al. 2001). Therefore the paper answers the following question: How can environmental and social standards be integrated into the supply policies and supply processes?

The paper addresses in four steps the issues raised. First, there is a short introduction, which outlines the general problem of integrating sustainable development into supply (chain) management. As a second step, the paper will give an overview about sustainability in supply management. In part three, a brief description of the situation of the automobile industry is provided, which emphasises the importance of developing a structured sustainable supply concept. The fourth section provides the research project, taking the Volkswagen AG as an example of the automobile industry. The overall concept incorporating the four levels to achieve defined standards will be presented. Finally, some conclusions for sustainable purchasing are drawn, and implications for future research at the level of the started development process are given.

2 Sustainable Supply Management

Inter-organisational concepts or approaches for environmental or sustainability management have seen a great variety of developments, which incorporate among others green/environmental supply chain management (Seuring 2004). As one key element, supply strategies and processes can be identified (Bowen et al. 2001; Drumwright 1994). The purchasing or sourcing functions inside focal companies is the key actor to search for, evaluate and monitor suppliers. Such departments are also responsible for placing contracts with one particular supplier. Focal companies, such as Volkswagen in the automotive industry, often own highly visible global brands, are frequently attacked by NGOs, and are held account-
able for environmental and social problems observed in the earlier stages of their supply chain (Seuring/Goldbach 2006).

2.1 Environmental and Social Standards as the Normative Content Level

The acceptance and implementation of international environmental and social standards inside a company and along the supply chain orientation basis. Because of the complexity and uncertainty of economical, environmental and social corporate developments, there is a need for companies to create flexible solutions to the operative integration of additional supplier requirements during their business processes. In this context, environmental and social standards established by societal institutions play a superior role, although they have not yet reached a general and legally binding character (Matten/Wagner 1998). This is the reason why, especially in the textile industry, a lot of companies have formed their own standards (codes of conduct), e.g. on the content basis of the ILO conventions (Graafland 2002). The Social Accountability Initiative (SAI) assumes that meanwhile about 500 different codes of conduct for suppliers exist. Companies which have created such a code of conduct for their supply chain include e.g. BASF, C&A, Hewlett-Packard, Kraft, Otto, PUMA, and Steilmann.

Environmental standards can be defined as quantitative specifications to limit different kinds of anthropogenic impacts on human beings and/or the environment (SRU 1996). Social standards include accepted rules for designing labour relations, working conditions, and social safety systems. There is a huge variety of associated terms ranging from working conventions to social provision to cachets and codes of behaviour (Pallmann 2002). An overall definition does not exist; the meaning of social standards is in fact rather general (Brown 2000).

With the integration and implementation of standards for a special business process, a company normally tracks one of the following objectives: consumer protection and transparency on the market, environmental protection, or safety at work. In doing so, types of product, production and process standards as well as behaviour standards can be distinguished (McIntosh et al. 2003). For a company, mainly process standards (e.g. emission limit values or operational safety sanctions) and behaviour standards (e.g. freedom of association or collective bargaining) are important. Here lies the special characteristic and the resulting problem to find an effective way to integrate these standards into supply (chain) management.
The compliance of vendors cannot be monitored and ensured by analysing the supplied products in comparison to product standards like quality. Therefore it is necessary to combine the normative content level as embedded in supply policies of environmental and social standards and the purchasing process, which includes supplier evaluation and selection, as well as monitoring, combined with supplier qualification. The subsequently described research project brings both sides together for the effective operationalisation of sustainability.

2.2 Supplier Management at the Process Level

Suppliers are an important, critical resource for the success of a company. Sheth and Sharma (1997) constitute that “value creation by suppliers has become an area of interest to firms. Value creation can manifest itself in access to technology, access to markets, and access to information. Business customers will realize that suppliers provide access to value creation that will provide them with sustainable competitive advantage.” The integration of environmental and social standards into strategic supplier management is the basis for a sustainable supply (chain) management. Therefore it is necessary to coordinate a collective vision, missions and measures of both parties (buyer and supplier) for long term business relations. Supplier management consists of three parts: (1) Management of the supplier basis (election, evaluation and monitoring), (2) supplier development and (3) supplier integration, shown in figure 1 (Wagner 2003).
Figure 1: Elements of Supplier Management

Principally, every company has its own process for supplier management fitting them to variable organisational characteristics. Nevertheless, Webster and Wind (1972a, b) tried to outline a universal organizational buying decision process, including the cycle of five fundamental steps:

1. Identification of demand: A purchasing situation exists if there is a need for any product or service, which cannot be satisfied by the company itself and has to be bought from an external contractor.

2. Definition of targets and specifications: This step includes the exact determination of the product/service acquired in the purchasing requirements. These purchasing requirements are also influenced by other business units e.g. technical development, quality assurance, and logistics.

3. Finding purchasing alternatives: If the requirements and the schedule are set up, the market can be checked for available purchasing alternatives (supplier). Therefore, already-used supply sources as well as new potential suppliers are included according to the description of the product/service. If necessary, other business units will be factored into the supply process for the election decision.
4. Evaluation of all alternatives: The evaluation of supplier alternatives represents the main part of the whole buying process. It consists of balancing the different offers on the basis of the supply targets and product specifications defined in step two. For an elementary product, most of the time, the price is the final decision criteria. But for a complex product, uncertainties and problems in finding a solution can exist because of divergences of the offers. Decision making makes it necessary to assess the targets and specifications, and to distinguish the acceptable trade-offs.

5. Supplier selection: With the election of a supplier for the contract, the organizational buying decision process will be completed.

To minimize purchasing risks and to complete the supplier evaluation, a monitoring system is needed to confirm the supplier profile and situation on site. Therefore, companies undertake supplier audits to check information as well as to find opportunities for supplier development, which include all activities of a buyer, and help the supplier to improve performance and fulfil purchasing requirements related to technical, quality, supply skills, or cost reductions (Scannel et al. 2000).

Structuring both the content and process of supply management, Harland (2002) has proposed four levels in supply management, which represent a set of so-called interventions that management can take (see Figure 1):

- **The supply policy of a company** sets the overall frame and conditions for supply issues, taking into account medium- to long-term effects. Based on the corporate philosophy and strategy, supply policies specify basic rules and conditions for purchasing good or services. This might include an environmental and/or ethics policy, such as e.g. restricting supply choices to countries and corporations that do not exploit child labour. This may however be in conflict with supply policies aiming for the lowest costs. Hence, the policy level includes normative judgements, which are binding for the following levels.

- **Supply strategy** sets directions for organisations on supply issues, aiming to achieve a targeted position. Supply strategies should be closely integrated with other corporate strategies to support an overall strategic mission (Harland et al. 1999), which might even contribute to corporate competitive advantage. Supply strategies are often directions for providing operational performance improvements. Environmental supply strategies may be in place to ensure, for example, that pre-products are produced while obeying environmental and social standards.
• The next level covers supply management in a narrower sense, where supply activities are managed and monitored through planning and control. For example, this may involve the design and implementation of plans and controls to ensure that sources for environmentally-sound produced goods are available. This might include that suppliers are further developed to be able to meet such requirements.

• Level four deals with the operational level of supply management. On this level, the real action takes place. Decisions are made regarding which goods and services are purchased from which suppliers, enacting the day-to-day business. This provides a close link to the definition of purchasing presented above. “Supply policies, strategies, managerial plans and controls may or should guide or constrain the day-to-day operational decisions taken relating to supply” (Harland 2002).

This concept implies that the successful integration of sustainability and supply management needs to consider all four levels. Changes inside one of them automatically affect the other levels and vice versa. Therefore, these levels have to be checked for required adaptations in content, structures and processes. If a company develops and implements a new supply policy, which includes environmental and social aspects, e.g. the information (gath-
ering) strategy on the supply strategy level has to be extended. Furthermore, the management of supplier performance and development on the supply management level as well as the evaluation on the supply operations level have to be re-arranged for incorporating related new requirements into the decision making of the buyer. This outlines the impact on the whole supply management process and further to the overall supply chain of a company.

In line with these four levels of supply management, Zsidisin und Siferd define green supply as a ”(...) set of purchasing policies held, actions taken, and relationships formed in response to concerns associated with the natural environment. These concerns relate to the acquisition of raw materials, including supplier selection, evaluation, and development; supplier’s operations; in-bound distribution; packaging; recycling; reuse; resource reduction; and final disposal of the firm’s products.” (Zsidisin/Siferd 2001). One objective is to avoid a loss of reputation that might arise from insufficient environmental problems and lacking social standards at suppliers (Preuss 2001).

Consequently, environmental criteria form part of the requirements placed on suppliers aiming to reduce the input of natural resources and minimize environmental risks by improving the efficiency of suppliers (Simpson/Power 2005). Sustainability thereby covers external impacts upstream and downstream in the supply chain along the product life cycle and the involved actors (supplier and customer) (Seuring 2004; Green et al. 1996). One main objective is the economic success of a company’s supply chain by complying with environmental and social standards on the basis of collaboration and corporate development between buyer and supplier (Preuss 2005). Environmental impacts and violations of human rights should be discovered and stopped early in the supply chain. Thus, a rising influence of environmental and social standards on product and production decisions is expected for the future (Zhu et al. 2005).

The starting points for environmental and social requirements in supply management are the interaction of three different trends: (1) the increasing strategic importance of supply management (Goldbach et al. 2004), (2) the increasing importance of buyer-supplier-partnership both for “normal” business, but also facing environmental and social problems (Harland et al. 1999), and (3) the awareness of the connection between supply decisions and a firm’s environmental and social or sustainable performance (Seuring/Müller 2004; Bowen et al. 2001). As a result, sustainability in supply management accrues from the general adaptation of products to changed environmental and social conditions along the chain concerning design, ingredients, production systems, recycling, and disposal (Green 1996).
2.3 Issues in Environmental Supply Management

Basically, two different forms of environmental supply management can be distinguished: (1) the integration of environmental criteria/standards into product and production related decisions along the whole supply process (“greening the supply chain”) and (2) the optimisation of the environmental compatibility of purchased goods (“product-based green supply”) (Bowen et al. 2001). For the integration of environmental standards into all purchasing decisions, additional information about the environmental performances of suppliers must be gathered and evaluated. Their classification and rating schemes can be helpful, as they support related supplier selection and evaluation (Noci 1997). One related trend is the increasing international diffusion of standardised environmental management systems (EMS), such as ISO 14001 (Corbett/Kirsch 2001). Focal companies establish this as an “order qualifier”, which has to be met before a supplier is considered at all (Zhu/Sarkis 2004). Therefore it is necessary to incorporate specific environmental criteria into the purchasing guidelines. Furthermore, related processes for evaluating and auditing suppliers have to be set up (Bowen et al 2001; Zsidisin/Siferd 2001). The greening of the product as the second major option regards all stages of the life cycle and includes e.g. packaging, recycling, and disposal. Hence, purchased products can often be improved or replaced by other more environmentally-friendly products (Bowen et al. 2001). Yet, for technically more advanced products, which are produced according to the requirements defined by the customer, environmental criteria form part of the product requirement specifications. These specifications are usually measurable afterwards, so they are much easier to evaluate (Seuring/Müller 2004).

2.4 The Emergence of Socially Responsible Supply Management

Assessing suppliers regarding their performance on the social dimension of sustainability is much more difficult. Overall, social aspects are not very often taken up in related publications (Seuring/Müller 2004). First approaches are nevertheless appearing. These authors use terms such as “ethical sourcing” (Roberts 2003), “purchasing social responsibility” (Carter 2005) or “social responsible buying” (Drumwright 1994). One starting point is “ethical” sourcing initiatives, which might even include avoiding “obscure” contracts, but covers a wide range of aspects both regarding suppliers and customers Carter 2000; Cooper et al. 2000). One particularly relevant sector, the textile industry, has seen a great number of focal companies being blamed for unethical sourcing (Seuring/Goldbach 2006). Yet, this industry
has also played a major role in the development of related supplier monitoring schemes (Graafland 2002). Typical problems reported are illegal child and forced labour, low wages, and discrimination. This has further led to the establishment of the Social Accountability 8000 (SA 8000) standard (Rohitratana 2002), helping suppliers to signal that they fulfil related requirements.

Overall, the role of focal companies is of key importance in developing the field further. They “have to” integrate environmental and social criteria into their supply policies and processes. This is specified on a normative level, but implies operational implications, such as early warning systems for related problems or the operational implementation of related criteria in the supply processes. Before one such example is discussed, the automotive sector will be addressed, and recent developments regarding sustainability and supply chains will be discussed.

3 Sustainability, Supply Chains and the Automobile Industry

For the automobile industry, the vision and operational implementation of sustainable development is part of the overall objective to satisfy the need of our society for individual mobility. This can e.g. be seen by related statements from all major car producers (see as examples Volkswagen and Toyota). With the complexity of the product “car”, worldwide expansion, and at the same time the concentration of the branch on some multinationals, the industry is part of the so-called “sensible” branches for sustainability (Kreikebaum 2002). Therefore several automakers make efforts to integrate and transfer sustainability into their business strategies and actions (Simpson 2005; Koplin 2006). This forms part of a wider drive towards “sustainable mobility”, such as discussed in the related reports of the World Business Council for Sustainable Mobility; Mobility 2001, and Mobility 2030 (World Business Council for Sustainable Development 2004).

Each phase of a car’s product life cycle carries with its related impacts on the natural and human environment. One particular field automakers have a decisive influence on are the aspects of product design and manufacturing. Regarding manufacturing processes, adverse side effects are minimized these days (Department Trade and Industry 1991). Although large parts of the production processes are conducted by suppliers, the problems described above are also apparent in the automotive industry (Association des Constructeurs Européens d’ Automobiles, Japan Automobile Manufacturers Association, United Nations
Examples from the automotive industry are frequently featured in papers on supply chain management, as purchased materials usually account for 60 to 70 percent of the total manufacturing costs (Scannel et al. 2000). While the automakers have integrated sustainability issues into company guidelines and processes, e.g. by setting up environmental and social policies, they have only started to place such prerequisites on their suppliers. One starting point might be to ask for ISO 14001 implementation (Zhu/Sarkis 2004). So far, there have only been a few examples where such standards have been implemented into the structures and processes of the company’s supply management (Noci 1997; Simpson 2005). Examples provided so far discuss how automakers cooperate with and integrate suppliers into their new product development processes and related innovative technologies. This often implies a reduction of the supply base as well as closer co-operation (Noci 1997; Warren et al. 2001; Liker/Wu 2000). Environmental impacts of the single car manufacturing processes are assessed, and joint action is taken to minimise them (Warren et al. 2001; Geffen/Rothenberg 2000). Hence, related research on the sustainable supply chains in the automobile industry mainly focuses on operational issues such as individual manufacturing processes.

The wider issues of supplier selection and evaluation against sustainability-oriented criteria are greatly lacking. Further analysis of environmental and socially responsible supply management including these research fields as well as structured research approaches and theory development could not be identified [Error! Bookmark not defined.]. In this respect, the buyer’s supply processes are not addressed. A fundamental conceptual review of necessary changes of structures, i.e. the preconditions for the operationalisation of environmental and social standards in supply management, is missing (Seuring/Müller 2004; Green et al. 1996). Noci (1997), Murphy & Bendell (1998) and Carter & Dresner (2001) outlined first attempts, but a complete approach for integrating sustainability including both environmental and social standards into the supply management of the automobile industry does not exist.

Based on the previous discussion and related to the concept of the four levels of supply management (Harland 2002), this triggers the need for research addressing the following issues (Seuring/Müller 2004; Lamming/Hampson 1996; Bogaschewsky 2004):

1. Normative requirements for sustainable supply management: Identification of the normative supplier requirements for a sustainable supplier management,
2. Early detection of supply-related risks level: Creation of comprehensive early detec-
tion, information and communication systems for a better organisation in and be-
tween enterprises,
3. Operational implementation of supply processes: Adaptation of existing supply 
structures and processes to support operationalising of the normative supplier re-
quirements,
4. Supplier monitoring and development level: Development of appropriate and inde-
pendent measures, evaluation and control systems that include incentives, rewards, 
and suitable possibilities for qualification of suppliers.

Starting with these issues, the research project and its results (outlined subsequently) con-
centrate on the development of a structured concept for integrating environmental and social 
standards into the supply management of an automaker.

4 Developing a Sustainability Concept for Supply Management – The Case of 
Volkswagen

Against this background, Volkswagen has taken a proactive move towards sustainability in 
supply (chain) management. The company initiated an action research project from January 
2003 until August 2004 in co-operation with the University of Oldenburg (scientific part) 
and different departments of the entire Volkswagen group (practical part). The project was 
mainly driven by the five-person core team (three from Volkswagen, one each from the en-
vironment, human resources, and purchasing department, and two from the University of 
Oldenburg). The major structural backbone of the project was a series of six internal work-
shops which brought all company internal actors together. The process of conducting the 
project was of major importance, especially regarding the application of action research 
methodology. As this methodology and research process taken in the project has already 
been described elsewhere (Koplin 2005), this paper will cover this only briefly, and concen-
trate instead on the outcomes of the project.

4.1 Research Project

As mentioned, the research process taken within the project was of great importance. Over-
all, the project was made up of four different research stages along the time:
- Preliminary analysis (literature review),
Discourse workshops with all participants,
Review of the current purchasing structures (internal interviews), and
Involvement of first tier-suppliers (survey/supplier workshop).

1. Preliminary analysis
The preliminary analysis took place before the discourse-oriented main part of the project started. Main topics for these enquiries were: challenges (chances/risks) for globally acting companies which stem from environmental and social problems in supply chains. A major part of the status review concentrated on the standing, proliferation, and contents of existing environmental and social standards as well as discovering the most recognized standards. In line with this, related best practice and negative examples of other companies and industries were searched for. Based on this analysis, an overview of the current research status for sustainable development in supply chains and supply management was established as the starting point for the first internal workshop.

2. Discourse workshops
Six discourse workshops were used to discuss findings and propositions with a group of relevant people from inside Volkswagen. The intention was to get all departments involved in the project that could either contribute to developing a suitable solution and/or would later have to deal with the outcomes. The first workshop familiarized the participants with the topic by presenting the results of the preliminary analysis. In every workshop the current status of the ongoing research was discussed, and subsequent actions were determined. This way, it was aimed for integrating all internal stakeholders. The overall objective was to develop a feasible plan that allows Volkswagen to integrate sustainability issues into its supply policy and supply processes. As this has to be based on existing purchasing structure, the know-how of the practitioners was of great importance.

3. Purchasing structures
The review of the current situation was initiated to understand the company’s sourcing structures and processes and to identify weak points regarding environmental and social issues. These topics were mainly identified by looking at environmental and social standards.

The overall supply management system comprises four different phases: (1) the normative level, (2) early detection, (2) the purchasing process, and (4) monitoring and supplier development. Nine interviews with experts of the respective Volkswagen departments were car-
ried out. Statements were collected and analyzed to identify opportunities and needs for changes. This way, different solutions could be generated as ideal strategies, and were discussed at the workshops to identify a suitable solution.

4. Supplier integration

The integration of automobile suppliers was carried out by a survey in written form, as well as a direct involvement of five selected suppliers into a supplier workshop. The survey of 378 suppliers (mainly located in Germany) included questions about the cognition and importance of sustainability and the realization of environmental and social standards in their own companies and their supply chains. The rate of return consisted of 111 completed questionnaires that showed a picture of the current situation in the automobile supplier industry. This helped achieve an impression of the need for regulations of environmental and social aspects in the context of outsourcing processes (Koplin et al. 2005). For the discussion of the provisional concept, five suppliers were chosen to take part in a supplier workshop to get feedback before the planned implementation. This allowed the discussion of coming changes regarding supplier requirements and ensured that suppliers would agree to the proposed solution.

4.2 As-Is Analysis at Volkswagen AG

As already mentioned, the internal analyses of Volkswagen’s supply policy and supply processes at the start of the project were based on nine expert interviews with employees from different business units. As a further source of information, Volkswagen internal documents were analysed. The status-quo, as observed at the beginning of the project, will now be summarized.

4.2.1 Normative Requirements for Sustainable Supply Management

The basis for the operationalisation of sustainability in supply chains is the meeting of worldwide accepted institutional environmental and social standards also inside the own company. Therefore the Volkswagen AG admits to the mission statement of the business initiative “econsense”\(^1\) and to the Charta for a sustainable development by the International Chamber of Commerce. At the same time, Volkswagen supports the Global Compact\(^2\) and is

\(^1\) http://www.econsense.de/eng/mitglieder.htm

\(^2\) http://www.unglobalcompact.org
oriented towards the OECD-guidelines for multinational enterprises\textsuperscript{3}. Additionally, almost all production sites around the world are certified according to ISO 14001 or EMAS. Regarding the social dimension, since 2002 the global responsibility of the Volkswagen AG has been based on a code of conduct (Diller 1999), called the “Declaration of social rights and industrial relationships at Volkswagen”\textsuperscript{4}. This rests upon the SA 8000 standard.

4.2.2 Early Detection of Supply Related Risks

At Volkswagen the early detection of problems and risks (until recently) concentrated on the environmental aspect. Using a so-called “environmental radar”, external information is collected on a frequent basis, and stands for the exploration of long-term environmental framework conditions (changes and emerging risks). Resulting from this are the formulation and implementation of an environmental policy and strategy inside the company, which is one key part of the overall environmental management system. This ensures the integration of environmental objectives into the whole Volkswagen group, but also offers a link for related external communication with stakeholders. This aims at supporting all business processes with relevant environment-oriented information and improving related decision making.

4.2.3 Operational Implementation of Supply Processes

The supply processes of the Volkswagen AG included product related environmental requirements for suppliers but no prerequisites for obeying environmental and social standards in the production processes of suppliers. Volkswagen informs all suppliers about these product related standards with the purchasing inquiry. For the supplier selection the purchasing department uses a general supplier pool without any environmental and social evaluation or classification. Only the quality ratings and the economical situation of the supplier are stored in the related supplier database. During the technical test of the supply, all submitted offers are checked against the quality of the product and their specific environmental characteristics. An extensive check of the offers related to manufacturing standards does not exist. The only evaluation of suppliers is based on the ISO 9000 certification, self-information and quality audits. The main important factors for selecting a supplier are quality, reliable deliveries, and costs.

\textsuperscript{3} http://www.oecd.org/dataoecd/56/36/1922428.pdf
\textsuperscript{4} http://www.imfmetal.org/main/files/Sozialcharta_eng31.pdf
4.2.4 Monitoring und Supplier Development

At Volkswagen AG, checking and evaluating a supplier is based on quality issues, as is usually the case in this industry (Bandyopadhyay/Sprague 2002). Assessment criteria for placing in order are: (1) delivered products and services, (2) production facilities of the supplier, especially regarding their quality performance. Through self-information or self-audits, suppliers can give quality proofs to the Volkswagen AG. This is complemented by audits by Volkswagen quality management staff at supplier sites, which may be conducted on a short notice basis.

4.3 Developing a Sustainable Supply Management Concept at Volkswagen

Starting with the current situation of the Volkswagen AG, objectives had to be identified which are to be met when integrating environmental and social aspects into supply policies and processes. On the one hand, a first goal is the early identification of risk potentials and problem fields combined with the reduction (or rather prevention) of these risks. On the other hand, environmental and social standards can develop additional middle- or long-term competitive advantages inside business relations (Rao 2002). An environmentally and socially committed supplier is at the same time an economically above-average qualitative and safe partner for the customer (Seuring/Goldbach 2006). So, for a long-term and future oriented sustainable supply management, the ability for development in the supply chain based on collective learning processes is the decisive factor in creating win-win situations for both partners. For example, improvements in the organization of environmentalism can produce gains in efficiency, e.g. by the elimination of errors and breakdowns.

To realize these practical changes, the existing purchasing structures of Volkswagen were analyzed with all participating departments, weak points were identified, and solutions were discussed. The project tried to find an implementable and practicable solution to integrate environmental and social requirements and standards into the purchasing structures and processes of Volkswagen. The concept spans the four levels outlined above and will now be described in detail.

4.3.1 Normative Requirements for Sustainable Supply Management

The top, normative level of the concept includes the setting of general sustainability requirements in the relationships to business partners, which are derived from the company’s own standards. It is a necessary condition for Volkswagen to have a clear understanding of
what sustainable development means for the own company (mission statement). Furthermore, the company must comply with all environmental and social standards before passing them on to its suppliers. This facilitates the placing of such requirements on suppliers and asks them to pass them on in their own supply chains. In-house guidelines of the Volkswagen AG are (1) the environmental policy, (2) the environmental objectives, (3) the quality policy as well as (4) the “Declaration on Social Rights and Industrial Relationships”. These data were the basic principles in creating a catalogue of sustainability requirements where suppliers have to respond using a self-information procedure. For the environmental dimension, environmental management systems such as ISO 14001 are suitable instruments. This helps ensuring that a supplying company has related organisational and functional measures in place. It can be assumed that ISO 14001 will find an equally wide diffusion in the near future as that found with the quality management system ISO 9000 (Zhu et al. 2005; Corbett/Kirsch 2001). This is especially true for the automobile industry (Koplin et al. 2005).

Equal systems regarding social aspects, for example the SA 8000 or AA 1000, are not widely implemented. Their practical use is limited to just a few branches, e.g. the textile or toy industry (Graafland 2002; Rohitratana 2002). So there are no standardised systems that can be used within the social dimension. As a consequence, Volkswagen developed a code of conduct which suppliers have to obey. Within the self-evaluation, suppliers have to provide information on ISO 14001 certification and related environmental issues, occupational health and safety, and human rights.

4.3.2 Early Detection of Supply Related Risks

A second part of the concept includes the installation of a global internal and external issue screening. This is intended to allow provident identification of environmental and social risks and weak points at suppliers. All environmental and social topics that can be relevant for the company or industry are collected within this kind of a radar function. Potentially applied instruments are e.g. (1) internet inquiries, (2) expert panels, (3) media and specialized journalism screening, (4) contact to watchdog organisations, (5) noting legal drafts, and (6) regular dialogues with NGOs. Quite often, internal staff members are also able to detect related issues. To collect such information, an internal reporting requirement for all divisions will be introduced.
4.3.3 Operational Implementation of Supply Processes

While the two top levels are on a rather normative and strategic level, the third module of the supply policies and processes at the Volkswagen AG must be readjusted to include environmental and social aspects. This way, the general sustainability requirements are made operational in the relationships to business partners. The most important step is to account for these aspects when placing contracts with suppliers.

The process covers three main steps: (1) Environmental and social information is sampled in terms of self-information from business partners, which has to be updated before a specific purchasing decision is made. This self-information is the basis for evaluating and rating suppliers regarding to what degree they comply with standards set by Volkswagen’s sustainability requirements. Supported by plausibility checks from the quality assurance department, the supplier statements are analyzed to ensure their validity. Generally, Volkswagen asks its supplier to ensure the same requirements for sub-suppliers along the supply chain. The fulfilment of the specified environmental and social criteria then forms part of the overall sourcing decision. Therefore, they are related to the quality and delivery performance of the supplier. In the future, these criteria might have a prohibitive impact on the sourcing decision, meaning that a supplier that does not fulfil required environmental and social standards will not be awarded a sourcing contract.

4.3.4 Monitoring and Supplier Development

Along with the plausibility check, it is important for the Volkswagen AG to create control mechanisms for inspections. In individual cases, visits to the production sites of particular suppliers are conducted. In the long run, Volkswagen tries to build up a revision and audit system to obtain professional competence and routine in the processes. Suppliers not fulfilling several issues of the sustainability requirements have to initiate an internal improvement and development process. They are obliged to prove their changes regarding steps taken, timelines set, and results to be achieved. Additionally, Volkswagen supports all suppliers by information via an online supplier platform and technical support. Furthermore, there are plans for training suppliers in the form of workshops and seminars: This assists in spreading sustainability and deepens the co-operation between Volkswagen and its business partners.

Table 2 provides an overview of the four levels of the VW sustainability concept in comparison to the status of the supply policy and process before the research project started.
<table>
<thead>
<tr>
<th>Level</th>
<th>As-is Analysis</th>
<th>Sustainable supply management concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normative Requirements for Sustainable Supply Management</td>
<td>Product based environmental supplier requirements</td>
<td>Product and <strong>production</strong> based environmental and <strong>social</strong> supplier requirements</td>
</tr>
<tr>
<td></td>
<td>ISO 9000 as prerequisite</td>
<td>ISO 9000 und <strong>14001</strong> as prerequisite</td>
</tr>
<tr>
<td>Early Detection of Supply Related Risks</td>
<td>International environmental issue-screening</td>
<td>International environmental and <strong>social</strong> issue-screening with additional <strong>focus on suppliers</strong></td>
</tr>
<tr>
<td></td>
<td>No reporting requirement for divisions</td>
<td><strong>Reporting obligations</strong> for all divisions to a central department</td>
</tr>
<tr>
<td></td>
<td>No co-operation between divisions, no expert-team</td>
<td><strong>Expert-team</strong> (human resources, environment protection, procurement, quality assurance) to evaluate supplier information</td>
</tr>
<tr>
<td>Operational Implementation of Supply Processes</td>
<td>Supplier information for quality performance</td>
<td>Site-related <strong>self information</strong> via supplier platform</td>
</tr>
<tr>
<td></td>
<td>No evaluation and classification of suppliers</td>
<td>Environmental and social <strong>supplier evaluation</strong> based on a <strong>classification system</strong></td>
</tr>
<tr>
<td></td>
<td>Ratings from quality assurance, F&amp;E and logistics for the sourcing decision</td>
<td>Additional inclusion of <strong>environmental/social evaluation</strong> in the sourcing decision (no specific “sustainability” ratings)</td>
</tr>
<tr>
<td>Monitoring and Supplier Development</td>
<td>Quality audit with some environmental questions</td>
<td>Added case oriented <strong>revision of environmental and social standards</strong></td>
</tr>
<tr>
<td></td>
<td>No supplier information about environmental and social aspects</td>
<td><strong>Provision of information</strong> on the supplier platform via Internet</td>
</tr>
<tr>
<td></td>
<td>Support to suppliers with environmental questions</td>
<td>Duty for supplier qualification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support to suppliers with environmental <strong>social problems</strong></td>
</tr>
</tbody>
</table>

**Table 1: Overview of the changes of the sustainability concept**

The framework of the four levels as described in the as-if analysis and the sustainable supply management concept at Volkswagen can be generalised. Figure 3 outlines a framework of how companies might implement environmental and social standards into their supply (chain) management. While the framework is rather general, it will have to be specified for a company when using it. Therefore this concept summarises how supply policy and supply processes can be complemented to account for sustainability issues. The Volkswagen AG will start their practical implementation in 2006. The company initiates a pilot phase to col-
lect information about the environmental and social standards at its suppliers and to examine the results of the different organisational changes inside the company. Figure 3 provides a summarizing overview of the four levels of the sustainability concept for supply (chain) management.

![Diagram of sustainability concept for supply management]

**Figure 3**: A conceptual framework for integrating sustainability into supply management

5 **Conclusions**

Companies are seen as key players on the societal path towards sustainability. This requires operational implementation far beyond the mission statement. It is necessary to find practical approaches for sustainable development inside the companies themselves, as well as in regard to their supply chains. This paper offers one approach for companies to attend to their social responsibility and integrate sustainability into supply management. Therefore environmental and social standard systems und their potentials for integration in the business processes of a company were analysed building on the case of Volkswagen. The result is a sustainability supply management concept consisting of four levels: (1) normative requirements, (2) early detection, (3) supply process, and (4) monitoring and supplier development. This should help to reduce or even eliminate environmental damages and social...
problems along the entire supply chain of a company, which can be seen as major step to-
ward sustainability.

The described research project conducted at Volkswagen establishes first findings within the
automobile industry. Therefore, the derived recommendations for action from the sustain-
ability concept can be seen as a design model or orientation framework, which has to be
verified and improved by further research. A first step comes from the operational imple-
mentation of the Volkswagen concept. It is necessary to analyse the effects on practice.
Only then it is possible to evaluate the true potential of the concept to implement sustain-
ability in supply (chain) management. To prove the universal validity of the concept, other
action research projects must be initiated, and/or multiple case studies must be carried out.
Afterwards more specified information would be available about the practical application,
the benefit, as well as any potential disadvantages. These research results will show how far
the developed sustainability concept can really contribute to the integration of sustainable
development into the structures and processes of supply management for enterprises.
References


